IHO Marine Protected Areas (MPA) - Annex A Data Classification and Encoding Guide

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Contents

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1 Overview

The "Data Classification and Encoding Guide" has been developed to provide consistent, standardized instructions for encoding S-100 compliant Marine Protected Area (MPA) (S-122) data.

The purpose of the Data Classification and Encoding Guide is to facilitate S-122 encoding to meet IHO standards for the proper display of Marine Protected Area information in an ECDIS and other electronic charting displays. This document describes how to encode information that the modeller considers relevant to an MPA. The content of an MPA product is at the discretion of the producing authority provided that the conventions described within this document are followed. A "producing authority" is a Hydrographic Office (HO) or other organization authorized by a government, to produce definitive nautical information. The entire S-100 Universal Hydrographic Data Model, including the S-122 MPA Product Specification, is available at the following web site, https://iho.int.

1.1 Introduction

S-122 is the Marine Protected Areas (MPA) Product Specification, produced by the International Hydrographic Organization. S-122 is designed to allow content, content definition (Feature Catalogues) and presentation (Portrayal Catalogues) to be updateable without breaking system implementations.

This document has been produced by the IHO Nautical Information Provision Working Group (NIPWG) in response to a requirement to produce a data product that can be used as a Nautical Publication Information Overlay (NPIO) within an Electronic Chart Display and Information Systems (ECDIS). It is based on the IHO S-100 framework specification and the ISO 19100 series of standards. It is a vector product specification that is intended for encoding information relating to port and harbour facilities for facilitating berth-to-berth navigation.

Marine Protected Area (MPA) datasets describe …

2 General

3 Description of table format for feature and information types

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4   Meta Feature Types

4.1   Data Coverage

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

CamelCase : DataCoverage

Alias : M_COVR

SuperType :

FeatureUseType : meta

Primitive : surface

Remarks : No remarks.

AttributeBindings :

Table 4-1

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Maximum Display Scale			IN	1, 1
Minimum Display Scale			IN	1, 1
Optimum Display Scale	(CSCALE)		IN	0, 1

4.1.1   General

The meta feature Data Coverage encodes the area covered by the dataset. This feature is also used to provide the ECDIS with the scale information necessary for the determination of dataset loading and unloading in relation to the user selected viewing scale in the ECDIS. There must be a minimum of one Data Coverage feature in a dataset. Data Coverage features must cover at least the extent of the spatial types in the dataset, and must not overlap.

> ### *EDITORIAL NOTE*
>
> *S-122 2.0.0 is not scale-independent since it uses DataCoverage objects for loading/unloading(?)*

The use of S-122 data is scale-independent (see clause 2.8) and minimum display scale will normally be (null) and maximum display scale 1000 (the extreme values in the table of scales in the S-101 ENC, see Table 2-11).

Should a producer need to encode different maximum and minimum display scales from the extreme (i.e., create scale-dependent datasets), the values of maximum and minimum display scales should be harmonized with base layer S-101 datasets (see the S-101 DCEG clause X.X).

The mandatory attribute maximumDisplayScale is used to indicate the largest intended viewing scale for the data.

The mandatory attribute minimumDisplayScale is used to indicate the smallest intended viewing scale for the data.

Given that S-122 data will overlay ENC and possibly other datasets, the conditions described in S-101 clause for displaying overscale warnings and setting the viewing scale may be overridden by interoperability constraints or the presence of higher-priority datasets. The specification of such behaviour is out of scope for this document (the S-100 interoperability specification should address it for ECDIS).

4.1.2 Remarks

This meta feature is intended to support an indication of coverage.

- Where a dataset consists of only one DataCoverage feature, the value for the maximum display scale populated in the dataset discovery metadata must be the same as the value populated for maximum display scale on the DataCoverage.
- For any DataCoverage feature, maximum display scale < minimum display scale.
- S-122 does not use the NULL value, which is permitted in S-101 for minimumDisplayScale when maximumDisplayScale=10,000,000. An appropriate greater value may be used instead.

4.2 Quality of Non-Bathymetric Data

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

CamelCase : QualityOfNonBathymetricData

Alias : M_ACCY

SuperType :

FeatureUseType : meta

Primitive : surface

Remarks : No remarks.

AttributeBindings :

Table 4-2

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Temporal Variation		1:Extreme Event 4:Likely to Change 5:Unlikely to Change 6:Unassessed	EN	0, 1
Horizontal Distance Uncertainty	(HORACC)		RE	0, 1
Horizontal Position Uncertainty	(POSACC)		C	0, 1
Uncertainty Fixed	(POSACC)		(S) RE	1, 1
Uncertainty Variable Factor			(S) RE	0, 1
Orientation Uncertainty			RE	0, 1
Survey Date Range			C	0, 1
Date Start	(DATSTA)		(S) TD	0, 1
Date End	(DATEND)		(S) TD	1, 1
Information	(INFORM)		C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1

5 Geographic Feature Types

5.1 Feature Type

Definition : Generalized feature type which carries all the common attributes.

CamelCase : FeatureType

Alias :

SuperType :

FeatureUseType : geographic

Primitive : noGeometry

Remarks : No remarks.

AttributeBindings :

Table 5-1

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Interoperability Identifier			UN	0, *
Feature Name			C	0, *
Language			(S) TE	1, 1
Name	(OBJNAM)		(S) TE	1, 1
Name Usage		1:Default Name Display 2:Alternate Name Display 3:No Chart Display	(S) EN	0, 1
Fixed Date Range			C	0, 1
Date Start	(DATSTA)		(S) TD	0, 1
Date End	(DATEND)		(S) TD	0, 1
Periodic Date Range			C	0, *
Date Start	(DATSTA)		(S) TD	1, 1
Date End	(DATEND)		(S) TD	1, 1
RxN Code			C	0, *
Category of RxN		1:Navigation 2:Communication 3:Environmental Protection 4:Wildlife Protection 5:Security 6:Customs 7:Cargo Operation 8:Refuge 9:Health 10:Natural Resources or Exploitation 11:Port 12:Finance	(S) CL	0, 1

		13:Agriculture		
Action or Activity		1:Navigating With a Pilot 2:Entering Port 3:Leaving Port 4:Berthing 5:Slipping 6:Anchoring 7:Weighing Anchor 8:Transiting 9:Overtaking 10:Reporting 11:Working Cargo 12:Landing 13:Diving 14:Fishing 15:Discharging Overboard 16:Passing 17:Ballast Water Exchange 18:Hull Cleaning	(S) CL	0, 1
Headline			(S) TE	0, 1
Graphic			C	0, *
Pictorial Representation	(PICREP)		(S) TE	1, *
Picture Caption			(S) TE	0, 1
Source Date	(SORDAT)		(S) DA	0, 1
Picture Information			(S) TE	0, 1
Bearing Information			(S) C	0, 1
Cardinal Direction	(CARDIR)	1:North 2:North Northeast 3:Northeast 4:East Northeast 5:East 6:East Southeast 7:Southeast 8:South Southeast 9:South 10:South Southwest 11:Southwest 12:West Southwest 13:West 14:West Northwest 15:Northwest 16:North Northwest	(S) EN	0, 1
Distance			(S) RE	0, 1
Information	(INFORM)		(S) C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1

Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1
Orientation			(S) C	0, 1
Orientation Uncertainty			(S) RE	0, 1
Orientation Value	(ORIENT)		(S) RE	1, 1
Source Indication			C	0, *
Category of Authority	(CATAUT)		(S) EN	0, 1
Country Name			(S) TE	0, 1
Source			(S) TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images 11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data	(S) EN	0, 1
Reported Date	(SORDAT)		(S) TD	0, 1
Feature Name			(S) C	0, *
Language			(S) TE	1, 1
Name	(OBJNAM)		(S) TE	1, 1
Name Usage		1:Default Name Display 2:Alternate Name Display 3:No Chart Display	(S) EN	0, 1
Text Content	(TXTCON)		C	0, *
Category of Text	(CATTXT)	1:Abstract or Summary 2:Extract 3:Full Text	(S) EN	0, 1
Source			(S) TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images	(S) EN	0, 1

		11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data			
Reported Date	(SORDAT)			(S) TD	0, 1

InfomationBindings :

Table 5-2

Type	Association Name	Class	Role	Multiplicity
association	Permission Type	Applicability	permission	0, *
association	Associated RxN	AbstractRxN	theRxN	0, *
association	Additional information	NauticalInformation	theInformation	0, *

5.1.1 Geographic features in general

Where a complex attribute has all its sub-attributes optional (e.g., multiplicity 0..1 or 0..*), at least one of the sub-attributes must be populated.

The featureName attribute in complex attribute sourceIndication is intended for the name of the source.

The additionalInformation association to a NauticalInfomation object can be used to attach an additional chunk of information to an information type, and there is no applicable specific information type or association. This should be used sparingly if at all. Restrictions, regulations, etc., related to geographic features

Navigation and other activities in areas can be limited by regulations/restrictions and recommendations. That information is usually provided by relevant authorities. If the feature has specific attributes to encode such information (such as a restriction attribute), those attributes must be used wherever possible; if the specific attributes are insufficient, an appropriate Restrictions, Regulations, Recommendations, or NauticalInformation information type can be associated to the feature using an associatedRxN association. Restrictions, regulations, etc., that depend on vessel characteristics

Information that is conditional on vessel characteristics may be encoded using the PermissionType association to an information type that defines the set of vessels to which the conditions apply. (See sections 2.5, 7.8, and 8.1 of this DCEG and section 6.2 of the S-122 Product Specification for more information about coding such conditions.)

5.2 Information Area

Definition : An area for which general information regarding navigation, but not directly related to safety of navigation, is available.

CamelCase : InformationArea

Alias : M_NPUB

SuperType :

FeatureUseType : geographic

Primitive : surface

Remarks : No remarks.

AttributeBindings :

Table 5-3

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Relationship		1:Prohibited 3:Permitted	EN	1, 1
Action or Activity		17:Ballast Water Exchange	CL	1, 1

5.2.1 General

The **InformationArea** feature is used to encode areas for which ballast water management rules have been defined. Encode the areas using an InformationArea feature and set the attributes as follows:

- actionOrActivity is set to "Ballast Water Exchange"
- categoryOfRelationship attribute is set to either *prohibited* or *permitted* to indicate whether it is an area where ballast water exchange is prohibited or permitted.

Special regulations pertaining to the area, if any, can be encoded using a **Regulations** information type and associating the **InformationArea** feature to the **Regulations** instance using an **AssociatedRxN** association, which **InformationArea** inherits from its super-type **FeatureType**. Similarly, any recommendations, restrictions, or general information can be encoded using the appropriate information type (Recommendations, Restrictions, or NauticalInformation).

Figure 5-1 — Ballast Water Management Areas

5.3 Marine Protected Area

Definition : 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.

CamelCase : MarineProtectedArea

Alias : MPAARE

SuperType :

FeatureUseType : geographic

Primitive : curve surface

Remarks : No remarks.

AttributeBindings :

Table 5-4

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Marine Protected Area		1:IUCN Category Ia 2:IUCN Category Ib 3:IUCN Category II 4:IUCN Category III 5:IUCN Category IV 6:IUCN Category V 7:IUCN Category VI	CL	1, *
Category of Restricted Area	(CATREA)	1:Offshore Safety Zone 4:Nature Reserve 5:Bird Sanctuary 6:Game Reserve 7:Seal Sanctuary 10:Historic Wreck Area 20:Research Area 22:Fish Sanctuary 23:Ecological Reserve 27:Environmentally Sensitive Sea Area 28:Particularly Sensitive Sea Area 31:Coral Sanctuary 32:Recreation Area 33:Ship Pollution Emission Control	EN	0, *
Jurisdiction	(JRSDTN)	1:International 2:National 3:National Sub-Division	EN	0, 1
Restriction	(RESTRN)	1:Anchoring Prohibited 2:Anchoring Restricted 3:Fishing Prohibited 4:Fishing Restricted 5:Trawling Prohibited 6:Trawling Restricted 7:Entry Prohibited 8:Entry Restricted 9:Dredging Prohibited 10:Dredging Restricted 11:Diving Prohibited 12:Diving Restricted 13:No Wake 14:Area To Be Avoided 15:Construction Prohibited 16:Discharging Prohibited 17:Discharging Restricted 18:Industrial or Mineral Exploration/ Development Prohibited 19:Industrial or Mineral Exploration/ Development Restricted 20:Drilling Prohibited 21:Drilling Restricted 22:Removal of Historical Artefacts Prohibited 23:Cargo Transhipment (Lightening) Prohibited 24:Dragging Prohibited 25:Stopping Prohibited	EN	0, *

		26:Landing Prohibited 27:Speed Restricted 38:Use of Spuds Prohibited 39:Swimming Prohibited 40:SOx Emission Restricted 41:NOx Emission Restricted 42:Power-Driven Vessels Prohibited		
Status	(STATUS)	1:Permanent 2:Occasional 3:Recommended 4:Not in Use 5:Periodic/Intermittent 6:Reserved 7:Temporary 9:Mandatory 18:Existence Doubtful 28:Buoyed 13:Historic 14:Public	EN	0, *
Designation			C	0, *
Designation Scheme			(S) TE	0, 1
Designation Identifier			(S) TE	0, 1
Jurisdiction	(JRSDTN)	1:International 2:National 3:National Sub-Division	(S) EN	0, 1
Text	(INFORM)		(S) TE	0, 1

InfomationBindings :

Table 5-5

Type	Association Name	Class	Role	Multiplicity
association	Protected area authority	Authority	responsibleAuthority	0, *

5.3.1 Protected area categories

The Marine Protected Area categoryOfMarineProtectedArea attribute is an open enumeration codelist whose 'standard' values are specified by the IUCN categorization. National or other categorizations may be used for 'additional' values by agreement, but must be discussed with the S-122 project specification team before use. Producers must not use local categorizations unilaterally, without discussion. If the value cannot be provided the categoryOfMarineProtectedArea attribute has to set to "unknown".

5.3.2 Restrictions and regulations for protected areas

Navigation within Marine Protected areas can be limited by regulations/restrictions and recommendations. That information is usually provided by relevant authorities. If the restriction attribute suffices to encode such information, it must be used; otherwise an appropriate Restrictions, Regulations, Recommendations, or NauticalInformation information type can be associated to the MarineProtectedArea. Information that is conditional on vessel characteristics may be encoded using the PermissionType association to an information type that defines the set of vessels to which the conditions apply. (See Section 6.2 of the S-122 Product Specification and sections 2.5 and 7.8 of this DCEG for more information about coding such conditions.)

5.3.3 Natura 2000 categories

The complex attribute *designation* should be used to encode Natura 2000 area classifications. The sub-attributes of *designation* must be encoded as follows:

- The sub-attribute *designationScheme* must be populated with the string "Natura2000" (without quotes) optionally suffixed with the identifier of the list, using a colon as separator. For example, Natura2000:eea_t_natura2000_p_2023_v01_r00.

- The sub-attribute *designationIdentifier* must be populated with the official identifier in the Natura 2000 list, for example NL2008001

5.4 Restricted Area

Definition : A specified area designated by an appropriate authority within which navigation is restricted in accordance with certain specified conditions.

CamelCase : RestrictedArea

Alias : RESARE

SuperType :

FeatureUseType : geographic

Primitive : surface

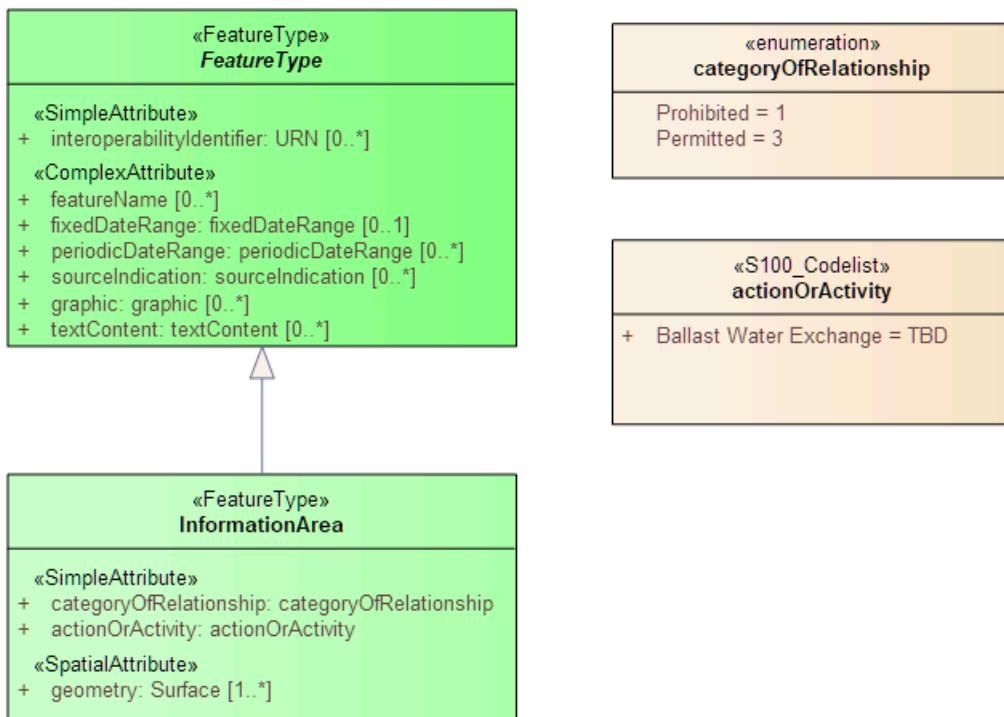**Remarks** : No remarks.

AttributeBindings :

Table 5-6

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Restricted Area	(CATREA)	1:Offshore Safety Zone 4:Nature Reserve 5:Bird Sanctuary 6:Game Reserve 7:Seal Sanctuary 10:Historic Wreck Area 20:Research Area 22:Fish Sanctuary 23:Ecological Reserve 27:Environmentally Sensitive Sea Area 28:Particularly Sensitive Sea Area 31:Coral Sanctuary 32:Recreation Area 33:Ship Pollution Emission Control	EN	0, *
Restriction	(RESTRN)	1:Anchoring Prohibited 2:Anchoring Restricted 3:Fishing Prohibited 4:Fishing Restricted 5:Trawling Prohibited 6:Trawling Restricted 7:Entry Prohibited 8:Entry Restricted 9:Dredging Prohibited 10:Dredging Restricted 11:Diving Prohibited 12:Diving Restricted 13:No Wake 14:Area To Be Avoided 15:Construction Prohibited 16:Discharging Prohibited 17:Discharging Restricted	EN	1, *

| | | 18:Industrial or Mineral Exploration/ Development Prohibited
19:Industrial or Mineral Exploration/ Development Restricted
20:Drilling Prohibited
21:Drilling Restricted
22:Removal of Historical Artefacts Prohibited
23:Cargo Transhipment (Lightening) Prohibited
24:Dragging Prohibited
25:Stopping Prohibited
26:Landing Prohibited
27:Speed Restricted
38:Use of Spuds Prohibited
39:Swimming Prohibited
40:SOx Emission Restricted
41:NOx Emission Restricted
42:Power-Driven Vessels Prohibited | | |
| Status | (STATUS) | 1:Permanent
2:Occasional
3:Recommended
4:Not in Use
5:Periodic/Intermittent
6:Reserved
7:Temporary
9:Mandatory
18:Existence Doubtful
28:Buoyed
13:Historic
14:Public | EN | 0, * |

INT 1 Reference: L 3, 5.2; M 29.1, N 2.1-2, 20-22, 25, 26, 31, 34, 63

5.4.1   Restricted areas in general (see S-4 – B-431.4; B-435.7; B-435.11; B-437.1-7; B-439.2-4; B-445.9; B-448; B-448.1 and B-449.5)

There are many types of areas within which certain activities are discouraged or prohibited, or from which certain classes of vessels are excluded. The general term for all areas in which certain aspects of navigation may be restricted or prohibited by regulations is "Restricted Area", or equivalent. The word "prohibited", or its equivalent, may appear in terms relating to activities which are contrary to the regulations, e.g. "Anchoring Prohibited", "Entry Prohibited". If it is required to encode a restricted area, it must be done using the feature Restricted Area or Marine Protected Areas.

Restricted Areas should be encoded in S-122 datasets only when they are one of the listed categories or otherwise related to marine protected areas, environmental, or wildlife protection.

The attribute category of restricted area is used to describe the type of area, while the attribute restriction describes the restrictions. An associated instance of the information types Restrictions, Regulations, Recommendations and Nautical Information, complex attributes text content sub-attribute information or solely attribute information may be used to provide an additional explanation about the restriction, where required.

5.4.2   Nature reserves (see S-4 – B-437.3)

If it is required to encode a marine nature reserve area with navigational restrictions, it must be done using a Restricted Area feature, with attribute category of restricted area = 4 (nature reserve).

5.4.3   Speed limits (see S-4 – B-430.2)

Speed is often limited inside MPAs in order to protect the species that inhabit the area. If it is required to encode this restriction, it must be done using a Restricted Area Navigational feature, with the attribute restriction = 27 (speed restricted), with the speed limit and its unit of measurement encoded using an associated instance of the information type Regulations(see clause 7.9),

5.4.4 Areas to be avoided (see S-4 – B-435.7)

If it is required to encode an IMO designated Area to be Avoided, it must be done using a Restricted Area Navigational feature, with attribute restriction = 14 (area to be avoided).

5.4.5 Environmentally Sensitive Sea Areas (see S-4 – B-437)

If it is required to encode an Environmentally Sensitive Sea Area with navigational restrictions, it must be done using a Restricted Area Navigational feature, with attribute category of restricted area = 27 (ESSA) or 28 (PSSA). An Environmentally Sensitive Sea Area that is shown on the source as a point symbol should be encoded using a small surface Restricted Area Navigational feature.

5.4.6 Anchoring restricted (see S-4 – B-431.4)

If it is required to encode a restricted anchoring area, it must be done using a Restricted Area Regulatory feature or using other features with the attribute restriction, where restriction = 1 (anchoring prohibited) or 2 (anchoring restricted). Additional information about the restriction should be encoded using an associated instance of the information class Nautical Information, complex attribute information.

Distinction: Marine Protected Area;

5.5 Vessel Traffic Service Area

Definition : 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.

CamelCase : VesselTrafficServiceArea

Alias : ADMARE VTS Area

SuperType :

FeatureUseType : geographic

Primitive : surface

Remarks : No remarks.

InfomationBindings :

Table 5-7

Type	Association Name	Class	Role	Multiplicity
association	Service control	Authority	controlAuthority	0, 1

5.5.1 General

Vessel traffic service areas are encoded in S-122 datasets only when they are related to protected area information in some way, for example if it is necessary to provide information about reporting entry into and departure from a protected area.

6 Cartographic Feature Types

6.1 Text Placement

Definition : The Text Placement feature is used in association with the Feature Name attribute or a light description to optimize text positioning in ECDIS.

CamelCase : TextPlacement

Alias :

SuperType :

FeatureUseType : cartographic

Primitive : point

Remarks : No remarks.

AttributeBindings :

Table 6-1

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Text Offset Bearing			IN	1, 1
Text Offset Distance			IN	1, 1
Text Rotation			BO	0, 1
Text Type		1:Name	EN	1, 2
Scale Minimum	(SCAMIN)		IN	0, 1

7   Information Types

7.1   Information Type

Definition : Generalized information type which carries all the common attributes.

CamelCase : InformationType

Alias :

SuperType :

AttributeBindings :

Table 7-1

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Feature Name			C	0, *
Language			(S) TE	1, 1
Name	(OBJNAM)		(S) TE	1, 1
Name Usage		1:Default Name Display 2:Alternate Name Display 3:No Chart Display	(S) EN	0, 1
Fixed Date Range			C	0, 1
Date Start	(DATSTA)		(S) TD	0, 1
Date End	(DATEND)		(S) TD	0, 1
Periodic Date Range			C	0, *
Date Start	(DATSTA)		(S) TD	1, 1
Date End	(DATEND)		(S) TD	1, 1

Graphic			C	0, *
Pictorial Representation	(PICREP)		(S) TE	1, *
Picture Caption			(S) TE	0, 1
Source Date	(SORDAT)		(S) DA	0, 1
Picture Information			(S) TE	0, 1
Bearing Information			(S) C	0, 1
Cardinal Direction	(CARDIR)	1:North 2:North Northeast 3:Northeast 4:East Northeast 5:East 6:East Southeast 7:Southeast 8:South Southeast 9:South 10:South Southwest 11:Southwest 12:West Southwest 13:West 14:West Northwest 15:Northwest 16:North Northwest	(S) EN	0, 1
Distance			(S) RE	0, 1
Information	(INFORM)		(S) C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1
Orientation			(S) C	0, 1
Orientation Uncertainty			(S) RE	0, 1
Orientation Value	(ORIENT)		(S) RE	1, 1
Source Indication			C	0, *
Category of Authority	(CATAUT)		(S) EN	0, 1
Country Name			(S) TE	0, 1

Source			(S) TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images 11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data	(S) EN	0, 1
Reported Date	(SORDAT)		(S) TD	0, 1
Feature Name			(S) C	0, *
Language			(S) TE	1, 1
Name	(OBJNAM)		(S) TE	1, 1
Name Usage		1:Default Name Display 2:Alternate Name Display 3:No Chart Display	(S) EN	0, 1

7.2 AbstractRxN

Definition : An abstract superclass for information types that encode rules, recommendations, and general information in text or graphic form.

CamelCase : AbstractRxN

Alias :

SuperType :

AttributeBindings :

Table 7-2

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Authority	(CATAUT)	2:Border Control 3:Police 4:Port 5:Immigration 6:Health 7:Coast Guard 8:Agricultural 9:Military 10:Private Company 11:Maritime Police 12:Environmental 13:Fishery 14:Finance 15:Maritime 16:Customs	EN	0, 1
RxN Code			C	0, *
Category of RxN		1:Navigation	(S) CL	0, 1

		2:Communication 3:Environmental Protection 4:Wildlife Protection 5:Security 6:Customs 7:Cargo Operation 8:Refuge 9:Health 10:Natural Resources or Exploitation 11:Port 12:Finance 13:Agriculture		
Action or Activity		1:Navigating With a Pilot 2:Entering Port 3:Leaving Port 4:Berthing 5:Slipping 6:Anchoring 7:Weighing Anchor 8:Transiting 9:Overtaking 10:Reporting 11:Working Cargo 12:Landing 13:Diving 14:Fishing 15:Discharging Overboard 16:Passing 17:Ballast Water Exchange 18:Hull Cleaning	(S) CL	0, 1
Headline			(S) TE	0, 1
Text Content	(TXTCON)		C	0, *
Category of Text	(CATTXT)	1:Abstract or Summary 2:Extract 3:Full Text	(S) EN	0, 1
Source			(S) TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images 11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data	(S) EN	0, 1
Reported Date	(SORDAT)		(S) TD	0, 1

InfomationBindings :

Table 7-3

Type	Association Name	Class	Role	Multiplicity
association	InclusionType	Applicability	isApplicableTo	0, *
association	Related organisation	Authority	theOrganisation	0, *

7.3 Applicability

Definition : 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.

CamelCase : Applicability

Alias :

SuperType :

AttributeBindings :

Table 7-4

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
In Ballast			BO	0, 1
Category of Cargo	(CATCGO)	1:Bulk 2:Container 3:General 4:Liquid 5:Passenger 6:Livestock 7:Dangerous or Hazardous 8:Heavy Lift 10:Dry Bulk Cargo 11:Liquid Bulk Cargo 12:Reefer Container Cargo 13:Ro-Ro Cargo 14:Project Cargo 15:Break Bulk Cargo	EN	0, *
Category Of Dangerous Or Hazardous Cargo	(CATDHC)	1:IMDG Code Class 1 Div. 1.1 2:IMDG Code Class 1 Div. 1.2 3:IMDG Code Class 1 Div. 1.3 4:IMDG Code Class 1 Div. 1.4 5:IMDG Code Class 1 Div. 1.5 6:IMDG Code Class 1 Div. 1.6 7:IMDG Code Class 2 Div. 2.1 8:IMDG Code Class 2 Div. 2.2 9:IMDG Code Class 2 Div. 2.3 10:IMDG Code Class 3 11:IMDG Code Class 4 Div. 4.1 12:IMDG Code Class 4 Div. 4.2 13:IMDG Code Class 4 Div. 4.3 14:IMDG Code Class 5 Div. 5.1 15:IMDG Code Class 5 Div. 5.2 16:IMDG Code Class 6 Div. 6.1 17:IMDG Code Class 6 Div. 6.2 18:IMDG Code Class 7 19:IMDG Code Class 8 20:IMDG Code Class 9 21:Harmful Substances in Packaged Form	EN	0, *
Category of Vessel		1:General Cargo Vessel 2:Container Carrier 3:Tanker 4:Bulk Carrier 5:Passenger Vessel 6:Roll-On Roll-Off 7:Refrigerated Cargo Vessel 8:Fishing Vessel 9:Service	CL	0, 1

		10:Warship 11:Towed or Pushed Composite Unit 12:Tug and Tow 13:Light Recreational 14:Semi-Submersible Offshore Installation 15:Jack-Up Exploration or Project Installation 16:Livestock Carrier 17:Sport Fishing		
Category of Vessel Registry		1:Domestic 2:Foreign	EN	0, 1
Logical Connectives	(LOGCON)	1:Logical Conjunction 2:Logical Disjunction	EN	0, 1
Thickness of Ice Capability			IN	0, 1
Vessel Performance			TE	0, 1
Destination			TE	0, 1
Information	(INFORM)		C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1
Vessel Measurements Specification			C	0, *
Comparison Operator	(COMPOP)	1:Greater Than 2:Greater Than or Equal To 3:Less Than 4:Less Than or Equal To 5:Equal To 6:Not Equal To	(S) EN	1, 1
Vessels Characteristics		1:Length Overall 2:Length at Waterline 3:Breadth 4:Draught 6:Displacement Tonnage 7:Displacement Tonnage, Light 8:Displacement Tonnage, Loaded 9:Deadweight Tonnage 10:Gross Tonnage 11:Net Tonnage 12:Panama Canal/Universal Measurement System Net Tonnage 13:Suez Canal Net Tonnage	(S) EN	1, 1
Vessels Characteristics Value			(S) RE	1, 1
Vessels Characteristics Unit	(VSLUNT)	1:Metres 3:Metric Ton	(S) EN	1, 1

		4:Ton 5:Short Ton 6:Gross Ton 7:Net Ton 9:Suez Canal Net Tonnage		

InfomationBindings :

Table 7-5

Type	Association Name	Class	Role	Multiplicity
association	InclusionType	AbstractRxN	theApplicableRxN	0, *

7.4 Authority

Definition : A person or organisation having political or administrative power and control.

CamelCase : Authority

Alias :

SuperType :

AttributeBindings :

Table 7-6

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Authority	(CATAUT)	2:Border Control 3:Police 4:Port 5:Immigration 6:Health 7:Coast Guard 8:Agricultural 9:Military 10:Private Company 11:Maritime Police 12:Environmental 13:Fishery 14:Finance 15:Maritime 16:Customs	EN	1, 1
Text Content	(TXTCON)		C	0, 1
Category of Text	(CATTXT)	1:Abstract or Summary 2:Extract 3:Full Text	(S) EN	0, 1
Source			(S) TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images 11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data	(S) EN	0, 1
Reported Date	(SORDAT)		(S) TD	0, 1

InfomationBindings :

Table 7-7

Type	Association Name	Class	Role	Multiplicity
association	Authority contact	ContactDetails	theContactDetails	0, *
association	Related organisation	AbstractRxN	organisationRelatedRxN	0, *
association	Authority hours	ServiceHours	theServiceHours	0, *

7.5 Contact Details

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

CamelCase : ContactDetails

Alias :

SuperType :

AttributeBindings :

Table 7-8

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Call Name			TE	0, 1
Call Sign	(CALSGN)		TE	0, 1
Category of Communication Preference		1:Preferred Calling 2:Alternate Calling 3:Preferred Working 4:Alternate Working	EN	0, 1
Communication Channel	(COMCHA)		TE	0, *
Contact Instructions			TE	0, 1
Language			TE	0, *
MMSI Code			TE	0, 1
Contact Address			C	0, *
Delivery Point	(DELPNT)		(S) TE	0, 1
City Name	(CITYNM)		(S) TE	0, 1
Administrative Division			(S) TE	0, 1
Country Name			(S) TE	0, 1
Postal Code	(POSCOD)		(S) TE	0, 1
Frequency Pair	(FRQPAR)		C	0, *
Frequency Shore Station Receives	(FRQRXV)		(S) IN	0, 1

Frequency Shore Station Transmits	(FRQTXM)		(S) IN	0, 1
Information	(INFORM)		C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1
Online Resource			C	0, *
Linkage			(S) UI	1, 1
Protocol	(PROTCL)		(S) TE	0, 1
Application Profile	(APPPRF)		(S) TE	0, 1
Name of Resource			(S) TE	0, 1
Online Resource Description			(S) TE	0, 1
Protocol Request	(PROTRQ)		(S) TE	0, 1
Online Function		1:Download 3:Offline Access 4:Order 5:Search 6:Complete Metadata 7:Browse Graphic 8:Upload 9:Email Service 10:Browsing 11:File Access	(S) EN	0, 1
Telecommunications			C	0, *
Category of Communication Preference		1:Preferred Calling 2:Alternate Calling 3:Preferred Working 4:Alternate Working	(S) EN	0, 1
Telecommunication Identifier			(S) TE	1, 1
Telecommunication Carrier			(S) TE	0, 1
Contact Instructions			(S) TE	0, 1
Telecommunication Service		1:Voice 2:Facsimile 3:SMS 4:Data	(S) EN	0, *

		5:Streamed Data 6:Telex 7:Telegraph 8:Email		

InfomationBindings :

<div align="center">

Table 7-9

</div>

Type	Association Name	Class	Role	Multiplicity
association	Authority contact	Authority	theAuthority	0, *

7.6 Nautical Information

Definition : Nautical information about a related area or facility.

CamelCase : NauticalInformation

Alias :

SuperType :

7.7 Non-Standard Working Day

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

CamelCase : NonStandardWorkingDay

Alias :

SuperType :

AttributeBindings :

<div align="center">

Table 7-10

</div>

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Date Fixed			TD	0, *
Date Variable			TE	0, *
Information	(INFORM)		C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1

7.8 Recommendations

Definition : Recommendations for a related area or facility.

CamelCase : Recommendations

Alias : RCMDTS

SuperType :

7.9 Regulations

Definition : Regulations for a related area or facility.

CamelCase : Regulations

Alias : REGLTS

SuperType :

7.10 Restrictions

Definition : Restrictions for a related area or facility.

CamelCase : Restrictions

Alias : RESDES

SuperType :

7.11 Service Hours

Definition : The time when a service is available and known exceptions.

CamelCase : ServiceHours

Alias :

SuperType :

AttributeBindings :

Table 7-11

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Schedule by Day of Week			C	1, *
Category of Schedule		1:Normal Operation 2:Closure 3:Unmanned Operation	(S) EN	0, 1
Time Intervals by Day of Week			(S) C	1, 10
Day of Week		1:Sunday 2:Monday 3:Tuesday 4:Wednesday 5:Thursday 6:Friday 7:Saturday	(S) EN	0, 7
Day of Week is Range			(S) BO	0, 1
Time of Day End			(S) TI	0, 99
Time of Day Start			(S) TI	0, 99
Information	(INFORM)		C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1

Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1

InfomationBindings :

Table 7-12

Type	Association Name	Class	Role	Multiplicity
association	Exceptional workday	NonStandardWorkingDay	partialWorkingDay	0, *
association	Authority hours	Authority	theAuthority_srvHrs	0, *

7.12 Spatial Quality

Definition : The indication of the quality of the locational information for features in a dataset.

CamelCase : SpatialQuality

Alias :

SuperType :

AttributeBindings :

Table 7-13

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Quality of Horizontal Measurement	(QUAPOS)	1:Surveyed 2:Unsurveyed 3:Inadequately Surveyed 4:Approximate 5:Position Doubtful 6:Unreliable 7:Reported (Not Surveyed) 8:Reported (Not Confirmed) 9:Estimated 10:Precisely Known 11:Calculated	EN	0, 1
Spatial Accuracy			C	0, *
Fixed Date Range			(S) C	0, 1
Date Start	(DATSTA)		(S) TD	0, 1
Date End	(DATEND)		(S) TD	0, 1
Horizontal Position Uncertainty	(POSACC)		(S) C	0, 1
Uncertainty Fixed	(POSACC)		(S) RE	1, 1
Uncertainty Variable Factor			(S) RE	0, 1
Vertical Uncertainty	(VERACC)		(S) C	0, 1
Uncertainty Fixed	(POSACC)		(S) RE	1, 1
Uncertainty Variable Factor			(S) RE	0, 1

8 Simple Attributes

8.1 Administrative Division

Definition : A generic term for an administrative region within a country at a level below that of the sovereign state.

CamelCase : administrativeDivision

Alias :

Remarks : No remarks.

8.2 Application Profile

Definition : Name of an application profile that can be used with the online resource.

CamelCase : applicationProfile

Alias : APPPRF

Remarks : No remarks.

8.3 Call Name

Definition : The designated call name of a station; for example, radio station, radar station, pilot.

CamelCase : callName

Alias :

Remarks : This is the name used when calling a radio station by radio; for example, "Singapore Pilots".

8.4 Call Sign

Definition : The designated call-sign of a station (radio station, radar station, pilot, …).

CamelCase : callSign

Alias : CALSGN

Remarks : No remarks.

8.5 Cardinal Direction

Definition : Principal and intermediate compass points.

CamelCase : cardinalDirection

Alias : CARDIR

Remarks : No remarks.

ListedValue :

Table 8-1

Code	Label	Definition
1	North	348.75-011.25 degrees (true north).
2	North Northeast	011.25 — 033.75 degrees.
3	Northeast	033.75 — 056.25 degrees.

4	East Northeast	056.25-078.75 degrees.
5	East	078.75-101.25 degrees.
6	East Southeast	101.25-123.75 degrees.
7	Southeast	123.75-146.25 degrees.
8	South Southeast	146.25-168.75 degrees.
9	South	168.75-191.25 degrees.
10	South Southwest	191.25-213.75 degrees.
11	Southwest	213.75-236.25 degrees.
12	West Southwest	236.25-258.75 degrees.
13	West	258.75-281.25 degrees.
14	West Northwest	281.25-303.75 degrees.
15	Northwest	303.75 — 326.25 degrees.
16	North Northwest	326.25 — 348.75 degrees.

8.6 Category of Authority

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

CamelCase : categoryOfAuthority

Alias : CATAUT

Remarks : No remarks.

ListedValue :

Table 8-2

Code	Label	Definition
2	Border Control	The administration to prevent or detect and prosecute violations of rules and regulations at international boundaries.
3	Police	The department of government, or civil force, charged with maintaining public order.
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.
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	Organization 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.
16	Customs	The agency or establishment for collecting duties, tolls.

8.7 Category of Cargo

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

CamelCase : categoryOfCargo

Alias : CATCGO

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

ListedValue :

Table 8-3

Code	Label	Definition
1	Bulk	Unpacked homogenous cargo poured loose in a certain space of a vessel, for example oil or grain.
2	Container	One of a number of standard sized cargo carrying units, secured using standard corner attachments and bar.
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.
8	Heavy Lift	Indivisible heavy items of weight generally over 100 tons, and width or height greater than 100 metres.
10	Dry Bulk Cargo	Commodity cargo that is transported unpackaged in large quantities. These types of goods usually need to be kept dry during the whole transportation period.
11	Liquid Bulk Cargo	Liquids or gases that are transported in bulk and carried unpackaged.
12	Reefer Container Cargo	Cargo transported in refrigerated containers, generally perishable commodities which require temperature-controlled transportation, such as fruit, meat, fish, vegetables, dairy products and other foods.
13	Ro-Ro Cargo	Wheeled cargo, such as cars, busses, trucks, agricultural vehicles and cranes, that are driven on and off the ship on their own wheels or using a platform vehicle, such as a self-propelled modular transporter.
14	Project Cargo	Project cargo is a term used to broadly describe the national or international transportation of large, heavy, high value, or critical (to the project they are intended for) pieces of equipment. Also commonly referred to as heavy lift, this includes

		shipments made of various components which need disassembly for shipment and reassembly after delivery.
15	Break Bulk Cargo	Goods that are stowed on board ship in individually counted units, and not in intermodal containers nor in bulk as with oil or grain.

8.8 Category of Communication Preference

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

CamelCase : categoryOfCommunicationPreference

Alias :

Remarks : No remarks.

ListedValue :

Table 8-4

Code	Label	Definition
1	Preferred Calling	The first choice channel or frequency to be used when calling a radio station.
2	Alternate Calling	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.
3	Preferred Working	The first choice channel or frequency to be used when working with a radio station.
4	Alternate Working	A channel or frequency to be used for working with a radio station when the preferred working channel or frequency is busy or is suffering from interference.

8.9 Category Of Dangerous Or Hazardous Cargo

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

CamelCase : categoryOfDangerousOrHazardousCargo

Alias : CATDHC

Remarks : No remarks.

ListedValue :

Table 8-5

Code	Label	Definition
1	IMDG Code Class 1 Div. 1.1	Explosives, Division 1: Substances and articles which have a mass explosion hazard.
2	IMDG Code Class 1 Div. 1.2	Explosives, Division 2: Substances and articles which have a projection hazard but not a mass explosion hazard.
3	IMDG Code Class 1 Div. 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	IMDG Code Class 1 Div. 1.4	Explosives, Division 4: Substances and articles which present no significant hazard.

5	IMDG Code Class 1 Div. 1.5	Explosives, Division 5: Very insensitive substances which have a mass explosion hazard.
6	IMDG Code Class 1 Div. 1.6	Explosives, Division 6: Extremely insensitive articles which do not have a mass explosion hazard.
7	IMDG Code Class 2 Div. 2.1	Gases, flammable gases.
8	IMDG Code Class 2 Div. 2.2	Gases, non-flammable, non-toxic gases.
9	IMDG Code Class 2 Div. 2.3	Gases, toxic gases.
10	IMDG Code Class 3	Flammable liquids.
11	IMDG Code Class 4 Div. 4.1	Flammable solids, self-reactive substances and desensitized explosives.
12	IMDG Code Class 4 Div. 4.2	Substances liable to spontaneous combustion.
13	IMDG Code Class 4 Div. 4.3	Substances which, in contact with water, emit flammable gases.
14	IMDG Code Class 5 Div. 5.1	Oxidizing substances.
15	IMDG Code Class 5 Div. 5.2	Organic peroxides.
16	IMDG Code Class 6 Div. 6.1	Toxic substances.
17	IMDG Code Class 6 Div. 6.2	Infectious substances.
18	IMDG Code Class 7	Radioactive material.
19	IMDG Code Class 8	Corrosive substances.
20	IMDG Code 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.

8.10 Category of Relationship

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

CamelCase : categoryOfRelationship

Alias :

Remarks : No remarks.

ListedValue :

Table 8-6

Code	Label	Definition
1	Prohibited	Use of facility, waterway or service is forbidden.
2	Not Recommended	Use of facility, waterway or service is not recommended.
3	Permitted	Use of facility, waterway, or service is permitted but not required.
4	Recommended	Use of facility, waterway, or service is recommended.
5	Required	Use of facility, waterway, or service is required.
6	Not Required	Use of facility, waterway, or service is not required.
7	Exclusively Permitted	Only vessels of the specified characteristics may use the facility, waterway, or service.

8.11 Category of Restricted Area

Definition : The official legal status of each kind of restricted area defines the kind of restriction(s), for example the restriction for a 'game reserve' may be 'entering prohibited'.

CamelCase : categoryOfRestrictedArea

Alias : CATREA

Remarks : No remarks.

ListedValue :

Table 8-7

Code	Label	Definition
1	Offshore Safety Zone	The area around an offshore installation within which vessels are prohibited from entering without permission. Special regulations protect installations within a safety zone and vessels of all nationalities are required to respect the zone.
4	Nature Reserve	A tract of land or water managed so as to preserve its flora, fauna, physical features, etc.
5	Bird Sanctuary	A place where birds are bred and protected.
6	Game Reserve	A place where wild animals or birds hunted for sport or food are kept undisturbed for private use.
7	Seal Sanctuary	A place where seals are protected.
10	Historic Wreck Area	An area around certain wrecks of historical importance to protect the wrecks from unauthorized interference by diving, salvage or deposition (including anchoring).
20	Research Area	An area where marine research takes place.
22	Fish Sanctuary	A place where fish (including shellfish and crustaceans) are protected.
23	Ecological Reserve	A tract of land managed so as to preserve the relation of plants and living creatures to each other and to their surroundings.
27	Environmentally Sensitive Sea Area	A generic term which may be used to describe a wide range of areas, considered sensitive for a variety of environmental reasons.
28	Particularly Sensitive Sea Area	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.

31	Coral Sanctuary	A place where coral is protected.
32	Recreation Area	An area within which recreational activities regularly take place and therefore vessel movement may be restricted.
33	Ship Pollution Emission Control	An area within which the ship pollution emission is controlled.

8.12 Category of Schedule

Definition : The type of schedule, for instance opening, closure, etc.

CamelCase : categoryOfSchedule

Alias :

Remarks : No remarks.

ListedValue :

Table 8-8

Code	Label	Definition
1	Normal Operation	The service, office, is open, fully manned, and operating normally, or the area is accessible as usual.
2	Closure	The service, office, or area is closed.
3	Unmanned Operation	The service is available but not manned.

8.13 Category of Temporal Variation

Definition : An assessment of the likelihood of change over time.

CamelCase : categoryOfTemporalVariation

Alias :

Remarks : No remarks.

ListedValue :

Table 8-9

Code	Label	Definition
1	Extreme Event	Indication of the possible impact of a significant event (for example hurricane, earthquake, volcanic eruption, landslide, etc), which is considered likely to have changed the seafloor or landscape significantly.
4	Likely to Change	Continuous or frequent change to non-bathymetric features (for example river siltation, glacier creep/recession, sand dunes, buoys, marine farms, etc).
5	Unlikely to Change	Significant change to the seafloor is not expected.
6	Unassessed	Not having been assessed.

8.14 Category of Text

Definition : Classification of completeness of textual information in relation to the source material from which it is derived.

CamelCase : categoryOfText

Alias : CATTXT

Remarks : No remarks.

ListedValue :

Table 8-10

Code	Label	Definition
1	Abstract or Summary	A statement summarizing the important points of a text.
2	Extract	An excerpt or excerpts from a text.
3	Full Text	The whole text.

8.15 Category of Vessel Registry

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

CamelCase : categoryOfVesselRegistry

Alias :

Remarks : No remarks.

ListedValue :

Table 8-11

Code	Label	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 in which the object that possesses this attribute applies or is located.

8.16 City Name

Definition : The name of a town or city.

CamelCase : cityName

Alias : CITYNM

Remarks : No remarks.

8.17 Communication Channel

Definition : A channel number assigned to a specific radio frequency, frequencies or frequency band.

CamelCase : communicationChannel

Alias : COMCHA

Remarks : The expected input is the specific VHF-Channel. The attribute 'communication channel' encodes the various VHF-channels used for communication.

8.18   Comparison Operator

Definition : Numerical comparison.

CamelCase : comparisonOperator

Alias : COMPOP

Remarks : Provides the relation between the value given in the model and the real ship's value.

ListedValue :

Table 8-12

Code	Label	Definition
1	Greater Than	The value of the left value is greater than that of the right.
2	Greater Than or Equal To	The value of the left expression is greater than or equal to that of the right.
3	Less Than	The value of the left expression is less than that of the right.
4	Less Than or Equal To	The value of the left expression is less than or equal to that of the right.
5	Equal To	The two values are equivalent.
6	Not Equal To	The two values are not equivalent.

8.19   Contact Instructions

Definition : Instructions provided on how to contact a particular person, organisation or service.

CamelCase : contactInstructions

Alias :

Remarks : No remarks.

8.20   Country Name

Definition : The name of a nation.

CamelCase : countryName

Alias :

Remarks : No remarks.

8.21   Date End

Definition : The latest date on which an object (for example a buoy) will be present.

CamelCase : dateEnd

Alias : DATEND

Remarks : The Date End should be encoded using 4 digits for the calendar year (YYYY), 2 digits for the month (MM) (for example April = 04) and 2 digits for the day (DD). When no specific month and/or day is required/known, indication of the month and/or day is omitted, and replaced with dashes (-). When no specific year is required (that is, the event or date range ends at the same time each year) the following two cases may be considered:- same day each year: ——MMDD- same month each year: ——MM— This conforms to ISO 8601: 2004. Date End indicates the latest date of an event or the end of a date range. It is used to indicate the end of a fixed date range, the end of a periodic date range, or the removal or cancellation of a feature at a specific date in the future.

8.22 Date Fixed

Definition : The date of an event.

CamelCase : dateFixed

Alias :

Remarks : No remarks.

8.23 Date Start

Definition : The earliest date on which an object (for example a buoy) will be present.

CamelCase : dateStart

Alias : DATSTA

Remarks : The Date Start should be encoded using 4 digits for the calendar year (YYYY), 2 digits for the month (MM) (for example April = 04) and 2 digits for the day (DD). When no specific month and/or day is required/known, indication of the month and/or day is omitted, and replaced with dashes (-). When no specific year is required (that is, the event or date range ends at the same time each year) the following two cases may be considered:- same day each year: ——MMDD- same month each year: ——MM— This conforms to ISO 8601: 2004. Date Start indicates the earliest date of an event or the start of a date range. It is used to indicate the start of a fixed date range, the start of a periodic date range, or the deployment or implementation of a feature at a specific date in the future.

8.24 Date Variable

Definition : A day which is not fixed in the Gregorian calendar.

CamelCase : dateVariable

Alias :

Remarks : Examples: The fourth Thursday in November; new moon day of Kartika (Diwali); Easter Sunday.

8.25 Day of Week

Definition : Any one of seven days in a week.

CamelCase : dayOfWeek

Alias :

Remarks : No remarks.

ListedValue :

Table 8-13

Code	Label	Definition
1	Sunday	The day of the week following Saturday and preceding Monday.
2	Monday	The day of the week following Sunday and preceding Tuesday.
3	Tuesday	The day of the week following Monday and preceding Wednesday.
4	Wednesday	The day of the week following Tuesday and preceding Thursday.
5	Thursday	The day of the week following Wednesday and preceding Friday.
6	Friday	The day of the week following Thursday and preceding Saturday.

| 7 | Saturday | The day of the week following Friday and preceding Sunday. |

8.26 Day of Week is Range

Definition : A statement expressing if the days of the week identified define a range or not.

CamelCase : dayOfWeekIsRange

Alias :

Remarks : A True value is an indication that the identified days of the week define a range between and inclusive of those days.

8.27 Delivery Point

Definition : Details of where post can be delivered such as the apartment, name and/or number of a street, building or PO Box.

CamelCase : deliveryPoint

Alias : DELPNT

Remarks : No remarks.

8.28 Designation Identifier

Definition : An identifier which is an instance of a particular, named scheme

CamelCase : designationIdentifier

Alias :

Remarks : No remarks.

8.29 Designation Scheme

Definition : An official name, title or description. This can be an identifier itself, or an identifier which is an instance of a named designation scheme.

CamelCase : designationScheme

Alias :

Remarks : No remarks.

8.30 Destination

Definition : The place or general direction to which a vessel is going or directed.

CamelCase : destination

Alias :

Remarks : No remarks.

8.31 Distance

Definition : A numeric measure of the spatial separation between two locations.

CamelCase : distance

Alias :

Remarks : No remarks.

8.32 File Locator

Definition : The location of a fragment of text or other information in a support file.

CamelCase : fileLocator

Alias :

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.

8.33 File Reference

Definition : The file name of an externally referenced text file.

CamelCase : fileReference

Alias : TXTDSC

Remarks : No remarks.

8.34 Frequency Shore Station Receives

Definition : The shore station receiver frequency.

CamelCase : frequencyShoreStationReceives

Alias : FRQRXV

Remarks : No remarks.

8.35 Frequency Shore Station Transmits

Definition : The shore station transmitter frequency.

CamelCase : frequencyShoreStationTransmits

Alias : FRQTXM

Remarks : No remarks.

8.36 Headline

Definition : Words set at the head of a passage or page to introduce or categorize.

CamelCase : headline

Alias :

Remarks : No remarks.

8.37 Horizontal Distance Uncertainty

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

CamelCase : horizontalDistanceUncertainty

Alias : HORACC

Remarks : The error is assumed to be positive and negative. The plus/minus character must not be encoded.

8.38 In Ballast

Definition : Whether the vessel is in ballast.

CamelCase : inBallast

Alias :

Remarks : No remarks.

8.39 Interoperability Identifier

Definition : A common unique identifier for entities which describe a single real-world feature, and which is used to identify instances of the feature in end-user systems where the feature may be included in multiple data product types.

CamelCase : interoperabilityIdentifier

Alias :

Remarks : No remarks.

8.40 Jurisdiction

Definition : The jurisdiction applicable to an administrative area.

CamelCase : jurisdiction

Alias : JRSDTN

Remarks : No remarks.

ListedValue :

Table 8-14

Code	Label	Definition
1	International	Involving more than one country; covering more than one national area.
2	National	An area administered or controlled by a single nation.
3	National Sub-Division	An area smaller than the nation in which it lies.

8.41 Language

Definition : The method of human communication, either spoken or written, consisting of the use of words in a structured and conventional way.

CamelCase : language

Alias :

Remarks : The language is encoded by a 3 character code following ISO 639-2/T.

8.42 Linkage

Definition : Location (address) for online access using a URL/URI address or similar addressing scheme.

CamelCase : linkage

Alias :

Remarks : No remarks.

8.43 Logical Connectives

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

CamelCase : logicalConnectives

Alias : LOGCON

Remarks : 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 logicalConnectives 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.

ListedValue :

Table 8-15

Code	Label	Definition
1	Logical Conjunction	All the conditions described by the other attributes of the object, or sub-attributes of the same complex attribute, are true.
2	Logical Disjunction	At least one of the conditions described by the other attributes of the object, or sub-attributes of the same complex attributes, is true.

8.44 Maximum Display Scale

Definition : The largest intended viewing scale for the data.

CamelCase : maximumDisplayScale

Alias :

Remarks : No remarks.

8.45 Membership

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

CamelCase : membership

Alias :

Remarks : No remarks.

ListedValue :

Table 8-16

Code	Label	Definition

| 1 | Included | Vessels with these characteristics are included in the regulation/restriction/recommendation/nautical information. |
| 2 | Excluded | Vessels with these characteristics are excluded from the regulation/restriction/recommendation/nautical information. |

8.46 Minimum Display Scale

Definition : The smallest intended viewing scale for the data.

CamelCase : minimumDisplayScale

Alias :

Remarks : No remarks.

8.47 MMSI Code

Definition : 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.

CamelCase : mMSICode

Alias :

Remarks : No remarks.

8.48 Name

Definition : The individual name of a feature.

CamelCase : name

Alias : OBJNAM

Remarks : No remarks.

8.49 Name of Resource

Definition : Name of the online resource.

CamelCase : nameOfResource

Alias :

Remarks : No remarks.

8.50 Name Usage

Definition : Classification of the type and display level of the name of a feature in an end-user system.

CamelCase : nameUsage

Alias :

Remarks : No remarks.

ListedValue :

Table 8-17

Code	Label	Definition
1	Default Name Display	The name is intended to be displayed when the end-user system is set to the default name/text display setting.
2	Alternate Name Display	The name is intended to be displayed when the end-user system is set to an alternate name/text display setting, for example an alternate language.
3	No Chart Display	The name or text is not intended to be displayed.

8.51   Online Function

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

CamelCase : onlineFunction

Alias :

Remarks : No remarks.

ListedValue :

Table 8-18

Code	Label	Definition
1	Download	Online instructions for transferring data from one storage device or system to another.
3	Offline Access	Online instructions for requesting the resource from the provider.
4	Order	Online order process for obtaining the resource.
5	Search	To make painstaking investigation or examination.
6	Complete Metadata	Complete metadata provided.
7	Browse Graphic	Browse graphic provided.
8	Upload	Online resource upload capability provided.
9	Email Service	Online email service provided.
10	Browsing	Online browsing provided.
11	File Access	Online file access provided.

8.52   Online Resource Description

Definition : Detailed text description of what the online resource is/does (ISO 19115)

CamelCase : onlineResourceDescription

Alias :

Remarks : No remarks.

8.53   Optimum Display Scale

Definition : The largest intended viewing scale for the data.

CamelCase : optimumDisplayScale

Alias : CSCALE

Remarks : No remarks.

8.54 Orientation Uncertainty

Definition : The best estimate of the accuracy of a bearing.

CamelCase : orientationUncertainty

Alias :

Remarks : No remarks.

8.55 Orientation Value

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

CamelCase : orientationValue

Alias : ORIENT

Remarks : No remarks.

8.56 Pictorial Representation

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

CamelCase : pictorialRepresentation

Alias : PICREP

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

8.57 Picture Caption

Definition : Short description of the purpose of the image.

CamelCase : pictureCaption

Alias :

Remarks : No remarks.

8.58 Picture Information

Definition : A set of information to provide credits to picture creator, copyright owner etc.

CamelCase : pictureInformation

Alias :

Remarks : No remarks.

8.59 Postal Code

Definition : 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.

CamelCase : postalCode

Alias : POSCOD Postcode ZIP Code

Remarks : No remarks.

8.60 Protocol

Definition : Connection protocol to be used. Example: ftp, http get KVP, http POST, etc.

CamelCase : protocol

Alias : PROTCL

Remarks : No remarks.

8.61 Protocol Request

Definition : 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.

CamelCase : protocolRequest

Alias : PROTRQ

Remarks : No remarks.

8.62 Quality of Horizontal Measurement

Definition : The degree of reliability attributed to a position.

CamelCase : qualityOfHorizontalMeasurement

Alias : QUAPOS

Remarks : No remarks.

ListedValue :

Table 8-19

Code	Label	Definition
1	Surveyed	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.
2	Unsurveyed	Survey data is does not exist or is very poor.
3	Inadequately Surveyed	Not surveyed to modern standards; or due to its age, scale, or positional or vertical uncertainties is not suitable to the type of navigation expected in the area.
4	Approximate	A position that is considered to be less than third-order accuracy, but is generally considered to be within 30.5 metres of its correct geographic location. Also may apply to an object whose position does not remain fixed.
5	Position Doubtful	Of uncertain position. The expression is used principally on charts to indicate that a wreck, shoal, etc., has been reported in various positions and not definitely determined in any.
6	Unreliable	A feature's position has been obtained from questionable or unreliable data.
7	Reported (Not Surveyed)	An object 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 object.

8	Reported (Not Confirmed)	An object whose position has been reported and its position has not been confirmed.
9	Estimated	The most probable position of an object determined from incomplete data or data of questionable accuracy.
10	Precisely Known	A position that is of a known value, such as the position of an anchor berth or other defined object.
11	Calculated	A position that is computed from data.

8.63 Reported Date

Definition : The date that the item was observed, done, or investigated.

CamelCase : reportedDate

Alias : SORDAT

Remarks : No remarks.

8.64 Restriction

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

CamelCase : restriction

Alias : RESTRN

Remarks : Defines the kind of restriction(s), for example, 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 using an Information type.

ListedValue :

Table 8-20

Code	Label	Definition
1	Anchoring Prohibited	An area within which anchoring is not permitted.
2	Anchoring Restricted	A specified area designated by appropriate authority, within which anchoring is restricted in accordance with certain specified conditions.
3	Fishing Prohibited	An area within which fishing is not permitted.
4	Fishing Restricted	A specified area designated by appropriate authority, within which fishing is restricted in accordance with certain specified conditions.
5	Trawling Prohibited	An area within which trawling is not permitted.
6	Trawling Restricted	A specified area designated by appropriate authority, within which trawling is restricted in accordance with certain specified conditions.
7	Entry Prohibited	An area within which navigation and/or anchoring is prohibited.
8	Entry Restricted	A specified area designated by appropriate authority, within which navigation is restricted in accordance with certain specified conditions.
9	Dredging Prohibited	An area within which dredging is not permitted.
10	Dredging Restricted	A specified area designated by appropriate authority, within which dredging is restricted in accordance with certain specified conditions.
11	Diving Prohibited	An area within which diving is not permitted.

12	Diving Restricted	A specified area designated by appropriate authority, within which diving is restricted in accordance with certain specified conditions.
13	No Wake	Mariners must adjust the speed of their vessels to reduce the wave or wash which may cause erosion or disturb moored vessels.
14	Area To Be Avoided	An IMO declared routeing measure comprising an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ships.
15	Construction Prohibited	The erection of permanent or temporary fixed structures or artificial islands is prohibited.
16	Discharging Prohibited	An area within which discharging or dumping is prohibited.
17	Discharging Restricted	A specified area designated by an appropriate authority, within which discharging or dumping is restricted in accordance with specified conditions.
18	Industrial or Mineral Exploration/ Development Prohibited	An area within which industrial or mineral exploration and development are prohibited.
19	Industrial or Mineral Exploration/ Development Restricted	A specified area designated by an appropriate authority, within which industrial or mineral exploration and development is restricted in accordance with certain specified conditions.
20	Drilling Prohibited	An area within which excavating a hole on the sea-bottom with a drill is prohibited.
21	Drilling Restricted	A specified area designated by an appropriate authority, within which excavating a hole on the sea-bottom with a drill is restricted in accordance with certain specified conditions.
22	Removal of Historical Artefacts Prohibited	An area within which the removal of historical artefacts is prohibited.
23	Cargo Transhipment (Lightening) Prohibited	An area in which cargo transhipment (lightening) is prohibited.
24	Dragging Prohibited	An area in which the dragging of anything along the bottom, e.g. bottom trawling, is prohibited.
25	Stopping Prohibited	An area in which a vessel is prohibited from stopping.
26	Landing Prohibited	An area in which landing is prohibited.
27	Speed Restricted	An area within which speed is restricted.
38	Use of Spuds Prohibited	The use of anchoring spuds (telescopic piles) is prohibited.
39	Swimming Prohibited	An area in which swimming is prohibited.
40	SOx Emission Restricted	An area within which the emission of SOx is restricted.
41	NOx Emission Restricted	An area within which the emission of NOx is restricted.
42	Power-Driven Vessels Prohibited	An area within which any vessel propelled by machinery is prohibited.

8.65 Scale Minimum

Definition : The minimum scale at which the feature may be used for example for ECDIS presentation.

CamelCase : scaleMinimum

Alias : SCAMIN

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

8.66 Source

Definition : The publication, document, or reference work from which information comes or is acquired.

CamelCase : source

Alias :

Remarks : May be populated with the corresponding paper chart Notice to Mariners numbers, although other references are permitted.

8.67 Source Date

Definition : The production date of the source; for example the date of measurement.

CamelCase : sourceDate

Alias : SORDAT

Remarks : No remarks.

8.68 Source Type

Definition : Type of the source.

CamelCase : sourceType

Alias :

Remarks : No remarks.

ListedValue :

Table 8-21

Code	Label	Definition
1	Law or Regulation	Treaty, convention, or international agreement; law or regulation issued by a national or other authority.
2	Official Publication	Publication not having the force of law, issued by an international organisation or a national or local administration.
7	Mariner Report, Confirmed	Reported by mariner(s) and confirmed by another source.
8	Mariner Report, Not Confirmed	Reported by mariner(s) but not confirmed.
9	Industry Publications and Reports	Shipping and other industry publications, including graphics, charts and web sites.
10	Remotely Sensed Images	Information obtained from satellite images.
11	Photographs	Information obtained from photographs.
12	Products Issued by HO Services	Information obtained from products issued by Hydrographic Offices.

| 13 | News Media | Information obtained from news media. |
| 14 | Traffic Data | Information obtained from the analysis of traffic data. |

8.69 Status

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

CamelCase : status

Alias : STATUS

Remarks : No remarks.

ListedValue :

Table 8-22

Code	Label	Definition
1	Permanent	Intended to last or function indefinitely.
2	Occasional	Acting on special occasions; happening irregularly.
3	Recommended	Presented as worthy of confidence, acceptance, use, etc.
4	Not in Use	Use has ceased, but the facility still exists intact; disused.
5	Periodic/ Intermittent	Recurring at intervals.
6	Reserved	Set apart for some specific use.
7	Temporary	Meant to last only for a time.
9	Mandatory	Compulsory; enforced.
13	Historic	Famous in history; of historical interest.
14	Public	Belonging to, available to, used or shared by, the community as a whole and not restricted to private use.
18	Existence Doubtful	A feature that has been reported but has not been definitely determined to exist.
28	Buoyed	Marked by buoys.

8.70 Telecommunication Carrier

Definition : The name of a provider or type of carrier for a telecommunication service. This service may include land line based, shore based or satellite based radio connections.

CamelCase : telecommunicationCarrier

Alias :

Remarks : No remarks.

8.71 Telecommunication Identifier

Definition : An identifier, such as words, numbers, letters, symbols, or any combination of those used to establish a contact to a particular person, organisation or service.

CamelCase : telecommunicationIdentifier

Alias :

Remarks : No remarks.

8.72 Telecommunication Service

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

CamelCase : telecommunicationService

Alias :

Remarks : No remarks.

ListedValue :

Table 8-23

Code	Label	Definition
1	Voice	The transfer or exchange of information by using sounds that are being made by mouth and throat when speaking.
2	Facsimile	A system of transmitting and reproducing graphic matter (as printing or still pictures) by means of signals sent over telephone lines.
3	SMS	Short Message Service is a form of text messaging communication on phones and mobile phones.
4	Data	A representation of facts, concepts or instructions in a formalised manner suitable for communication, interpretation or processing.
5	Streamed Data	Data that is constantly received by and presented to an end-user while being delivered by a provider.
6	Telex	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).
7	Telegraph	An apparatus, system or process for communication at a distance by electric transmission over wire.
8	Email	Messages and other data exchanged between individuals using computers in a network.

8.73 Text

Definition : A non-formatted digital text string.

CamelCase : text

Alias : INFORM NINFOM

Remarks : Should be used, for example, to hold the information that is for short cautionary or explanatory notes. Therefore, text populated in text must not exceed 300 characters. Text may be in English, or in a national language. No formatting of text is possible within text. If formatted text, or text strings exceeding 300 characters, is required, then an alternate concept should be used.

8.74 Text Offset Bearing

Definition : The angular distance measured from true north that text associated with a feature is positioned from the feature in an end-user system.

CamelCase : textOffsetBearing

Alias :

Remarks : No remarks.

8.75   Text Offset Distance

Definition : The distance that text associated with a feature is positioned from the feature in an end-user system.

CamelCase : textOffsetDistance

Alias :

Remarks : No remarks.

8.76   Text Rotation

Definition : A statement that expresses if text associated with a feature is to be rotated in the ECDIS display or not.

CamelCase : textRotation

Alias :

Remarks : No remarks.

8.77   Text Type

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

CamelCase : textType

Alias :

Remarks : No remarks.

ListedValue :

Table 8-24

Code	Label	Definition
1	Name	The individual name of a feature.

8.78   Thickness of Ice Capability

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

CamelCase : thicknessOfIceCapability

Alias :

Remarks : No remarks.

8.79   Time of Day End

Definition : The time corresponding to the end of an active period.

CamelCase : timeOfDayEnd

Alias :

Remarks : The time of day end must be encoded using 2 digits for the hour (hh), 2 digits for the minutes(mm) and 2 digits for the seconds (ss). This conforms to ISO 8601:2004.

8.80 Time of Day Start

Definition : The time corresponding to the start of an active period.

CamelCase : timeOfDayStart

Alias :

Remarks : The time of day start must be encoded using 2 digits for the hour (hh), 2 digits for the minutes(mm) and 2 digits for the seconds (ss). This conforms to ISO 8601:2004.

8.81 Uncertainty Fixed

Definition : The best estimate of the fixed horizontal or vertical accuracy component for positions, depths, heights, vertical distances and vertical clearances.

CamelCase : uncertaintyFixed

Alias : POSACC SOUACC VERACC

Remarks : No remarks.

8.82 Uncertainty Variable Factor

Definition : The factor to be applied to the variable component of an uncertainty equation so as to provide the best estimate of the variable horizontal or vertical accuracy component for positions, depths, heights, vertical distances and vertical clearances.

CamelCase : uncertaintyVariableFactor

Alias :

Remarks : No remarks.

8.83 Vessel Performance

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.

CamelCase : vesselPerformance

Alias :

Remarks : No remarks.

8.84 Vessels Characteristics

Definition : Characteristics of vessels.

CamelCase : vesselsCharacteristics

Alias :

Remarks : No remarks.

ListedValue :

Table 8-25

Code	Label	Definition
1	Length Overall	The maximum length of the ship.
2	Length at Waterline	The ship's length measured at the waterline.

3	Breadth	The width or beam of the vessel.
4	Draught	The depth of water necessary to float a vessel fully loaded.
6	Displacement Tonnage	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.
7	Displacement Tonnage, Light	The weight of the ship excluding cargo, fuel, ballast, stores, passengers, and crew, but with water in the boilers to steaming level.
8	Displacement Tonnage, Loaded	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.
9	Deadweight Tonnage	The difference between displacement, light and displacement, loaded. A measure of the ship's total carrying capacity.
10	Gross Tonnage	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.
11	Net Tonnage	Obtained from the gross tonnage by deducting crew and navigating spaces and allowances for propulsion machinery.
12	Panama Canal/ Universal Measurement System Net Tonnage	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.
13	Suez Canal Net Tonnage	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.

8.85 Vessels Characteristics Unit

Definition : The unit used for vessel characteristics attribute.

CamelCase : vesselsCharacteristicsUnit

Alias : VSLUNT

Remarks : No remarks.

ListedValue :

Table 8-26

Code	Label	Definition
1	Metres	The basic unit of length in the International System of Units (SI) system.
3	Metric Ton	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.
4	Ton	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 m) of salt water with a density of 64 lb/ft (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).
5	Short Ton	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 US 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 US system (short or net hundredweight) and 112 pounds (50.80234544 kg) in the Imperial system (long or gross hundredweight).
6	Gross Ton	Gross tonnage (GT) is a function of the volume of all ship's enclosed spaces (from keel to funnel) measured to the outside of the hull framing. There is a sliding scale factor. So GT is a kind of capacity-derived index that is used to rank a ship for purposes of determining manning, safety and other statutory requirements and is expressed simply as GT, which is a unitless entity, even though its derivation is tied to the cubic meter unit of volumetric capacity.Tonnage measurements are now governed by an IMO Convention (International Convention on Tonnage Measurement of Ships, 1969 (London-Rules)), which applies to all ships built after July 1982. In accordance with the Convention, the correct term to use now is GT, which is a function of the moulded volume of all enclosed spaces of the ship.
7	Net Ton	Net tonnage (NT) is based on a calculation of the volume of all cargo spaces of the ship. It indicates a vessels earning space and is a function of the moulded volume of all cargo spaces of the ship.
9	Suez Canal Net Tonnage	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.

8.86 Vessels Characteristics Value

Definition : The value of a particular characteristic such as a dimension or tonnage of a vessel.

CamelCase : vesselsCharacteristicsValue

Alias :

Remarks : Indicates range limits in expressions characterizing vessels by dimensions and tonnages. The unit of measure, characteristic, and comparison operator (greater, less, etc.) are encoded separately.

8.87 Action or Activity

Definition : The action or activity of a vessel.

CamelCase : actionOrActivity

Alias :

Remarks : No remarks.

ListedValue :

Table 8-27

Code	Label	Definition
1	Navigating With a Pilot	Carrying a qualified pilot as part of the vessel navigation team.
2	Entering Port	Navigating a vessel into a port.
3	Leaving Port	Navigating a vessel out of a port.
4	Berthing	A signal station for the control of vessels when berthing.
5	Slipping	Detaching a vessel from a wharf or jetty.
6	Anchoring	Attaching a vessel to the seabed by means of an anchor and cable.
7	Weighing Anchor	Detaching a vessel from the seabed by recovering an anchor and cable.
8	Transiting	Navigating a vessel along a route or through a narrow gap, such as under a bridge or through a lock.
9	Overtaking	Navigating a vessel past another traveling broadly in the same direction.
10	Reporting	Providing details such as the name, location or intentions of a vessel.
11	Working Cargo	Loading or unloading cargo.
12	Landing	Placing crew or passengers on shore.
13	Diving	A signal or message warning of diving activity.
14	Fishing	Hunting or catching fish.
15	Discharging Overboard	Releasing anything into the sea; often ballast water; or spoil from dredging elsewhere.
16	Passing	Navigating a vessel past another travelling broadly in the opposite direction.
17	Ballast Water Exchange	Discharge and uptake of ballast water.
18	Hull Cleaning	The removal or treatment of biofouling (accumulation of aquatic organisms including microfouling and macrofouling) from a ship's submerged surfaces, including hull and niche areas, conducted either in-water or during dry-docking. The process includes both proactive cleaning (periodic removal of microfouling) and reactive cleaning (removal of micro- and macrofouling as corrective action).

8.88 Category of Marine Protected Area

Definition : Classification of marine protected areas based on IUCN (International Union for Conservation of Nature and Natural Resources) categories.

CamelCase : categoryOfMarineProtectedArea

Alias :

Remarks : No remarks.

ListedValue :

Table 8-28

Code	Label	Definition

1	IUCN Category Ia	Strict Nature Reserve: Protected area managed mainly for science.
2	IUCN Category Ib	Wilderness Area: Protected area managed mainly for wilderness protection.
3	IUCN Category II	National Park: Protected area managed mainly for ecosystem protection and recreation.
4	IUCN Category III	Natural Monument: Protected area managed mainly for conservation of specific natural features.
5	IUCN Category IV	Habitat/Species Management Area: Protected area managed mainly for conservation through management intervention.
6	IUCN Category V	Protected Landscape/Seascape: Protected area managed mainly for landscape/ seascape conservation and recreation.
7	IUCN Category VI	Managed Resource Protected Area: Protected area managed mainly for the sustainable use of natural ecosystems.

8.89   Category of RxN

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

CamelCase : categoryOfRxN

Alias :

Remarks : No remarks.

ListedValue :

Table 8-29

Code	Label	Definition
1	Navigation	The process of directing the movement of a craft from one point to another.
2	Communication	Transmitting and/or receiving electronic communication signals.
3	Environmental Protection	Pertaining to environmental protection.
4	Wildlife Protection	Pertaining to wildlife protection.
5	Security	Pertaining to security.
6	Customs	The agency or establishment for collecting duties, tolls.
7	Cargo Operation	Pertaining to cargo operations.
8	Refuge	Pertaining to a place of safety or refuge.
9	Health	The authority with responsibility for checking the validity of the health declaration of a vessel and for declaring free pratique.
10	Natural Resources or Exploitation	Pertaining to natural resources or exploitation.
11	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.
12	Finance	An authority with responsibility for the control and movement of money.

13	Agriculture	The science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.

8.90 Category of Vessel

Definition : Classification of vessels by function or use.

CamelCase : categoryOfVessel

Alias :

Remarks : No remarks.

ListedValue :

Table 8-30

Code	Label	Definition
1	General Cargo Vessel	A vessel which is designed for carrying general cargo, e.g. boxes, sacks.
2	Container Carrier	A vessel designed to carry ISO containers.
3	Tanker	A vessel which is designed for carrying liquid goods, for example oil or water.
4	Bulk Carrier	A vessel which is designed for carrying bulk goods, e.g. coal, ore or grain.
5	Passenger Vessel	A day trip or cabin vessel constructed and equipped to carry more than 12 passengers.
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 that is used and equipped for the fishing of living aquatic resources.
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.
11	Towed or Pushed Composite Unit	Either a tug and tow, or any combination of a tug providing propulsion to barges or vessels secured ahead or alongside.
12	Tug and Tow	A combination of tug(s) and non-powered tow(s).
13	Light Recreational	A pleasure boat or watercraft, or an excursion vessel used for short cruises such as whale watching.
14	Semi-Submersible Offshore Installation	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.
15	Jack-Up Exploration or Project Installation	An exploration or project installation with legs which can be raised and lowered. The legs are raised when the installation is re-positioned. When stationary the legs are lowered to the sea floor and the working platform is raised clear of the sea surface.
16	Livestock Carrier	A vessel designed to carry large quantities of live animals.
17	Sport Fishing	A vessel used in fishing for pleasure or competition.

9   Complex Attributes

9.1   Bearing Information

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

CamelCase : bearingInformation

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-1

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Cardinal Direction	(CARDIR)	1:North 2:North Northeast 3:Northeast 4:East Northeast 5:East 6:East Southeast 7:Southeast 8:South Southeast 9:South 10:South Southwest 11:Southwest 12:West Southwest 13:West 14:West Northwest 15:Northwest 16:North Northwest	EN	0, 1
Distance			RE	0, 1
Information	(INFORM)		C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1
Orientation			C	0, 1
Orientation Uncertainty			(S) RE	0, 1
Orientation Value	(ORIENT)		(S) RE	1, 1

9.2   Contact Address

Definition : 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.

CamelCase : contactAddress

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-2

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Delivery Point	(DELPNT)		TE	0, 1
City Name	(CITYNM)		TE	0, 1
Administrative Division			TE	0, 1
Country Name			TE	0, 1
Postal Code	(POSCOD)		TE	0, 1

9.3 Designation

Definition : An official name, title or description. This can be an identifier or an identifier which is an instance of a named designation scheme.

CamelCase : designation

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-3

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Designation Scheme			TE	0, 1
Designation Identifier			TE	0, 1
Jurisdiction	(JRSDTN)	1:International 2:National 3:National Sub-Division	EN	0, 1
Text	(INFORM)		TE	0, 1

9.4 Feature Name

Definition : 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.

CamelCase : featureName

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-4

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Language			TE	1, 1
Name	(OBJNAM)		TE	1, 1
Name Usage		1:Default Name Display 2:Alternate Name Display 3:No Chart Display	EN	0, 1

9.5 Fixed Date Range

Definition : An active period of a single fixed event or occurrence, as the date range between discrete start and end dates.

CamelCase : fixedDateRange

Alias :

Remarks : Dates must be encoded in the format YYYYMMDD; using 4 digits for the calendar year (YYYY) and, optionally, 2 digits for the month (MM) (for example April = 04) and 2 digits for the day (DD). When no specific month and/or day is required/known, the values are replaced with dashes (-). The date range of a recurring event or occurrence must be encoded using periodicDateRange.

SubAttri ButeBinding :

Table 9-5

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Date Start	(DATSTA)		TD	0, 1
Date End	(DATEND)		TD	0, 1

9.6 Frequency Pair

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

CamelCase : frequencyPair

Alias : FRQPAR

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-6

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Frequency Shore Station Receives	(FRQRXV)		IN	0, 1
Frequency Shore Station Transmits	(FRQTXM)		IN	0, 1

9.7 Graphic

Definition : 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.

CamelCase : graphic

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-7

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Pictorial Representation	(PICREP)		TE	1, *
Picture Caption			TE	0, 1

Source Date	(SORDAT)		DA	0, 1
Picture Information			TE	0, 1
Bearing Information			C	0, 1
Cardinal Direction	(CARDIR)	1:North 2:North Northeast 3:Northeast 4:East Northeast 5:East 6:East Southeast 7:Southeast 8:South Southeast 9:South 10:South Southwest 11:Southwest 12:West Southwest 13:West 14:West Northwest 15:Northwest 16:North Northwest	(S) EN	0, 1
Distance			(S) RE	0, 1
Information	(INFORM)		(S) C	0, *
File Locator			(S) TE	0, 1
File Reference	(TXTDSC)		(S) TE	0, 1
Headline			(S) TE	0, 1
Language			(S) TE	0, 1
Text	(INFORM)		(S) TE	0, 1
Orientation			(S) C	0, 1
Orientation Uncertainty			(S) RE	0, 1
Orientation Value	(ORIENT)		(S) RE	1, 1

9.8 Horizontal Position Uncertainty

Definition : The best estimate of the accuracy of a position.

CamelCase : horizontalPositionUncertainty

Alias : POSACC

Remarks : The expected input is the maximum of the two-dimensional error. The error is assumed to be positive and negative.

SubAttri ButeBinding :

Table 9-8

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Uncertainty Fixed	(POSACC)		RE	1, 1
Uncertainty Variable Factor			RE	0, 1

9.9 Information

Definition : Textual information about the feature. The information may be provided as a string of text or as a file name of a single external text file that contains the text.

CamelCase : information

Alias : INFORM

Remarks : At least one of the sub-attributes file reference or text must be populated.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.

SubAttri ButeBinding :

Table 9-9

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
File Locator			TE	0, 1
File Reference	(TXTDSC)		TE	0, 1
Headline			TE	0, 1
Language			TE	0, 1
Text	(INFORM)		TE	0, 1

9.10 Online Resource

Definition : Information about online sources from which a resource or data can be obtained.

CamelCase : onlineResource

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-10

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Linkage			UI	1, 1
Protocol	(PROTCL)		TE	0, 1
Application Profile	(APPPRF)		TE	0, 1
Name of Resource			TE	0, 1
Online Resource Description			TE	0, 1
Protocol Request	(PROTRQ)		TE	0, 1
Online Function		1:Download 3:Offline Access 4:Order 5:Search 6:Complete Metadata 7:Browse Graphic 8:Upload 9:Email Service 10:Browsing 11:File Access	EN	0, 1

9.11 Orientation

Definition : (1) The angular distance measured from true north to the major axis of the feature. (2) In ECDIS, the mode in which information on the ECDIS is being presented. Typical modes include: north-up — as shown on a nautical chart, north is at the top of the display; Ships head-up — based on the actual heading of the ship, (e.g. Ships gyrocompass); course-up display — based on the course or route being taken.

CamelCase : orientation

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-11

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Orientation Uncertainty			RE	0, 1
Orientation Value	(ORIENT)		RE	1, 1

9.12 Periodic Date Range

Definition : The active period of a recurring event or occurrence.

CamelCase : periodicDateRange

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-12

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Date Start	(DATSTA)		TD	1, 1
Date End	(DATEND)		TD	1, 1

9.13 RxN Code

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

CamelCase : rxNCode

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-13

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of RxN		1:Navigation 2:Communication 3:Environmental Protection 4:Wildlife Protection 5:Security 6:Customs	CL	0, 1

		7:Cargo Operation 8:Refuge 9:Health 10:Natural Resources or Exploitation 11:Port 12:Finance 13:Agriculture		
Action or Activity		1:Navigating With a Pilot 2:Entering Port 3:Leaving Port 4:Berthing 5:Slipping 6:Anchoring 7:Weighing Anchor 8:Transiting 9:Overtaking 10:Reporting 11:Working Cargo 12:Landing 13:Diving 14:Fishing 15:Discharging Overboard 16:Passing 17:Ballast Water Exchange 18:Hull Cleaning	CL	0, 1
Headline			TE	0, 1

9.14 Schedule by Day of Week

Definition : The nature and timings of a daily schedule by days of the week.

CamelCase : scheduleByDayOfWeek

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-14

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Schedule		1:Normal Operation 2:Closure 3:Unmanned Operation	EN	0, 1
Time Intervals by Day of Week			C	1, 10
Day of Week		1:Sunday 2:Monday 3:Tuesday 4:Wednesday 5:Thursday 6:Friday 7:Saturday	(S) EN	0, 7
Day of Week is Range			(S) BO	0, 1
Time of Day End			(S) TI	0, 99
Time of Day Start			(S) TI	0, 99

9.15 Spatial Accuracy

Definition : Provides an indication of the vertical and horizontal positional uncertainty of bathymetric data, optionally within a specified date range.

CamelCase : spatialAccuracy

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-15

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Fixed Date Range			C	0, 1
Date Start	(DATSTA)		(S) TD	0, 1
Date End	(DATEND)		(S) TD	0, 1
Horizontal Position Uncertainty	(POSACC)		C	0, 1
Uncertainty Fixed	(POSACC)		(S) RE	1, 1
Uncertainty Variable Factor			(S) RE	0, 1
Vertical Uncertainty	(VERACC)		C	0, 1
Uncertainty Fixed	(POSACC)		(S) RE	1, 1
Uncertainty Variable Factor			(S) RE	0, 1

9.16 Source Indication

Definition : Information about the source document, publication, or reference from which object data or textual material included or referenced in a dataset are derived.

CamelCase : sourceIndication

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-16

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Authority	(CATAUT)		EN	0, 1
Country Name			TE	0, 1
Source			TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images 11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data	EN	0, 1

Reported Date	(SORDAT)		TD	0, 1
Feature Name			C	0, *
Language			(S) TE	1, 1
Name	(OBJNAM)		(S) TE	1, 1
Name Usage		1:Default Name Display 2:Alternate Name Display 3:No Chart Display	(S) EN	0, 1

9.17 Survey Date Range

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

CamelCase : surveyDateRange

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-17

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Date Start	(DATSTA)		TD	0, 1
Date End	(DATEND)		TD	1, 1

9.18 Telecommunications

Definition : A means or channel of communicating at a distance by electrical or electromagnetic means such as telegraphy, telephony, or broadcasting.

CamelCase : telecommunications

Alias :

Remarks : If no value is populated for the sub-attribute telecommunication service, this means the service is by voice communication. If no value is populated for the sub-attribute telecommunication carrier, this means the service is by land line communication.

SubAttri ButeBinding :

Table 9-18

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Communication Preference		1:Preferred Calling 2:Alternate Calling 3:Preferred Working 4:Alternate Working	EN	0, 1
Telecommunication Identifier			TE	1, 1
Telecommunication Carrier			TE	0, 1
Contact Instructions			TE	0, 1
Telecommunication Service		1:Voice 2:Facsimile 3:SMS	EN	0, *

		4:Data 5:Streamed Data 6:Telex 7:Telegraph 8:Email		

9.19   Text Content

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.

CamelCase : textContent

Alias : TXTCON

Remarks : 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.

SubAttri ButeBinding :

Table 9-19

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Category of Text	(CATTXT)	1:Abstract or Summary 2:Extract 3:Full Text	EN	0, 1
Source			TE	0, 1
Source Type		1:Law or Regulation 2:Official Publication 7:Mariner Report, Confirmed 8:Mariner Report, Not Confirmed 9:Industry Publications and Reports 10:Remotely Sensed Images 11:Photographs 12:Products Issued by HO Services 13:News Media 14:Traffic Data	EN	0, 1
Reported Date	(SORDAT)		TD	0, 1

9.20   Time Intervals by Day of Week

Definition : The regular weekly operation times of a service or schedule.

CamelCase : timeIntervalsByDayOfWeek

Alias :

Remarks : No remarks.

SubAttri ButeBinding :

Table 9-20

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Day of Week		1:Sunday 2:Monday 3:Tuesday 4:Wednesday	EN	0, 7

	5:Thursday 6:Friday 7:Saturday			
Day of Week is Range			BO	0, 1
Time of Day End			TI	0, 99
Time of Day Start			TI	0, 99

9.21 Vertical Uncertainty

Definition : The best estimate of the vertical accuracy of depths, heights, vertical distances and vertical clearances.

CamelCase : verticalUncertainty

Alias : VERACC

Remarks : Encodes the vertical uncertainty associated with any vertical measurement.

SubAttri ButeBinding :

Table 9-21

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Uncertainty Fixed	(POSACC)		RE	1, 1
Uncertainty Variable Factor			RE	0, 1

9.22 Vessel Measurements Specification

Definition : Combinations of values of measurable characteristics or dimensions of vessels, used to specify size and tonnage ranges.

CamelCase : vesselMeasurementsSpecification

Alias :

Remarks : Combines (i) specifications of vessels' measurable characteristics (length, beam, tonnages, etc.), (ii) limit values for the specified characteristics (with units), (iii) arithmetical comparison operators (greater than, etc.), and (iv) logical operators (AND/OR) to define a subset of vessels characterized by the specified ranges. For example, the combination (draught, 10.5, metres, greaterThan) describes "vessels with draught greater than 10.5 metres".

SubAttri ButeBinding :

Table 9-22

S-10x Attribute	S-57 Acronym	Allowable Encoding Value	Type	Multiplicity
Comparison Operator	(COMPOP)	1:Greater Than 2:Greater Than or Equal To 3:Less Than 4:Less Than or Equal To 5:Equal To 6:Not Equal To	EN	1, 1
Vessels Characteristics		1:Length Overall 2:Length at Waterline 3:Breadth 4:Draught 6:Displacement Tonnage 7:Displacement Tonnage, Light	EN	1, 1

		8:Displacement Tonnage, Loaded 9:Deadweight Tonnage 10:Gross Tonnage 11:Net Tonnage 12:Panama Canal/Universal Measurement System Net Tonnage 13:Suez Canal Net Tonnage		
Vessels Characteristics Value			RE	1, 1
Vessels Characteristics Unit	(VSLUNT)	1:Metres 3:Metric Ton 4:Ton 5:Short Ton 6:Gross Ton 7:Net Ton 9:Suez Canal Net Tonnage	EN	1, 1

10   Roles

10.1   The Authority

Definition : A pointer to an Authority object

CamelCase : theAuthority

Alias :

Remarks : No remarks.

10.2   Authority service hours

Definition : The authority for which service hours are given

CamelCase : theAuthority_srvHrs

Alias :

Remarks : No remarks.

10.3   Contact details

Definition : A pointer to an Contact Details object

CamelCase : theContactDetails

Alias :

Remarks : No remarks.

10.4   Control authority

Definition : The controlling organization or authority for a geographically located service

CamelCase : controlAuthority

Alias :

Remarks : No remarks.

10.5 Is applicable to

Definition : The object or class of objects to which the regulation, restriction, recommendation, or nautical information applies

CamelCase : isApplicableTo

Alias :

Remarks : No remarks.

10.6 Organisation-Related RxN

Definition : Reference to regulation, recommendation, restriction or general information related to an organisation

CamelCase : organisationRelatedRxN

Alias :

Remarks : No remarks.

10.7 Permission

Definition : 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.

CamelCase : permission

Alias :

Remarks : No remarks.

10.8 Partial working day

Definition : The work hours for a non-standard workday

CamelCase : partialWorkingDay

Alias :

Remarks : No remarks.

10.9 Responsible authority

Definition : The responsible authority

CamelCase : responsibleAuthority

Alias :

Remarks : No remarks.

10.10 Service Hours (reference)

Definition : Service hours for an authority or service provider

CamelCase : theServiceHours

Alias :

Remarks : No remarks.

10.11   The information

Definition : A pointer to an object that provides more information about the referencing feature or information type.

CamelCase : theInformation

Alias :

Remarks : Registry definition "The information" merely repeats the name.

10.12   The organisation

Definition : The organisation to which information relates

CamelCase : theOrganisation

Alias :

Remarks : No remarks.

10.13   The Quality Information

Definition : A pointer to an information type providing spatial quality information.

CamelCase : theQualityInformation

Alias :

Remarks : No remarks.

10.14   The RxN

Definition : The regulation, restriction, recommendation, or nautical information

CamelCase : theRxN

Alias :

Remarks : No remarks.

10.15   The Applicable RxN

Definition : The applicable regulation, restriction, recommendation or nautical information

CamelCase : theApplicableRxN

Alias :

Remarks : No remarks.

10.16   The Cartographic Text

Definition : A pointer to a specific cartographically positioned location for text.

CamelCase : theCartographicText

Alias :

Remarks : No remarks.

10.17 The Position Provider

Definition : A pointer to a specific feature(s).

CamelCase : thePositionProvider

Alias :

Remarks : No remarks.

10.18 The service hours for a non-standard workday

Definition : The usual service hours to which an exception applies

CamelCase : theServiceHours_nsdy

Alias :

Remarks : No remarks.

11   Information Associations

11.1 Additional information

Definition : A feature association for the binding between at least one instance of a geo feature and an instance of an information type.

CamelCase : AdditionalInformation

Alias :

Remarks : No remarks.

Role : The information

11.2 Authority contact

Definition : Contact information for an authority

CamelCase : AuthorityContact

Alias :

Remarks : No remarks.

Role : The Authority

Role : Contact details

11.3 Authority hours

Definition : Service hours for an authority

CamelCase : AuthorityHours

Alias :

Remarks : No remarks.

Role : Authority service hours

Role : Service Hours (reference)

11.4 Associated RxN

Definition : Association between a geographic location and a regulation, restriction, recommendation, or nautical information

CamelCase : AssociatedRxN

Alias :

Remarks : No remarks.

Role : The RxN

11.5 Exceptional workday

Definition : Exception to the usual working day

CamelCase : ExceptionalWorkday

Alias :

Remarks : No remarks.

Role : The service hours for a non-standard workday

Role : Partial working day

11.6 Protected area authority

Definition : There may be more than one such authority depending on how responsibilities are divided

CamelCase : ProtectedAreaAuthority

Alias :

Remarks : No remarks.

Role : Responsible authority

11.7 Related organisation

Definition : Related organisation

CamelCase : RelatedOrganisation

Alias :

Remarks : No remarks.

Role : Organisation-Related RxN

Role : The organisation

11.8 InclusionType

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

CamelCase : InclusionType

Alias :

Remarks : No remarks.

Role : The Applicable RxN

Role : Is applicable to

11.9 Permission Type

Definition : 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.

CamelCase : PermissionType

Alias :

Remarks : No remarks.

Role : Permission

11.10 Service control

Definition : The controlling authority for a service area

CamelCase : ServiceControl

Alias :

Remarks : This is an information association linking a location where a service is provided with an information type describing the provider. Contrast to serviceProvisionArea, which is a feature association linking the area served with another feature describing the provider. Role controlledService encodable only as a generic inverse association in 3.0.0 datasets as it is an information→feature link

Role : Control authority

11.11 Spatial Association

Definition : An association for the binding between a spatial type and its spatial quality information.

CamelCase : SpatialAssociation

Alias :

Remarks : No remarks.

Role : The Quality Information

12 Feature Associations

12.1 Text association

Definition : A feature association for the binding between a geo feature and the cartographically positioned location for text.

CamelCase : TextAssociation

Alias :

Remarks : No remarks.

Role : The Position Provider

Role : The Cartographic Text

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