**VTS47-13.3.2**



**VTS**

**Product Specification**

**Draft 0.6.0 – Sep 2019**

VTS Product Specification

**Document Revisions**

Revisions to the IALA Document are to be noted in the table prior to the issue of a revised document.

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| **Date** | **Page / Section Revised** | **Requirement for Revision** |
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**Table of Contents**

1 Overview 5

1.1 Introduction 5

2 References 5

3 Terms, definitions and abbreviations 6

3.1 Terms and definitions 6

3.2 Abbreviations 7

4 Product specification metadata 8

4.1 IALA Product Specification Maintenance 8

4.1.1 Introduction 8

4.1.2 New Edition 9

4.1.3 Revisions 9

4.1.4 Clarification 9

4.1.5 Version Numbers 9

5 Specification Scope 9

6 Data Product Identification 10

6.1 Dataset Identification 10

7 Data Content and structure 11

7.1 Introduction 11

7.2 Application Schema 12

7.2.1 Domain Model 13

7.2.2 Meta features application schema 17

7.3 Feature Catalogue 18

7.4 Feature Types 18

8 Co-ordinate Reference Systems (CRS) 18

8.1 Introduction 18

8.2 Horizontal Reference System 19

8.3 Projection 19

8.4 Vertical Coordinate Reference System 19

8.5 Temporal Reference System 19

8.6 VTS Information Service Data and Scale 19

9 Data Quality 19

10 Data Capture and Classification 19

11 Data Maintenance 20

12 Data Product format (encoding) 20

12.1 Introduction 20

12.2 Numeric Attribute Encoding 20

12.3 Text Attribute Values 20

12.4 Mandatory Attribute Values 20

12.5 Unknown Attribute Values 20

12.6 Structure of dataset files 20

12.7 Message object identifiers 21

12.8 Dataset validation 21

12.9 Location of Data Product Format schema Files 21

12.10 Detailed documentation of schema 22

13 Data Product Delivery 22

13.1 Message datasets 22

13.2 Collections 23

13.3 Dataset distribution 23

13.3.1 Datasets 23

13.3.2 Dataset size 23

13.3.3 Dataset file naming 23

13.4 Support Files 24

13.5 Exchange Catalogue 24

14 Metadata 24

15 Use of other standard documents in VTS-INS 25

16 Language 25

17 Acknowledgements 25

Annex A. Data Classification and Encoding Guide 26

Annex B. Data Product Format (Encoding) 27

*Annex C.* NORMATIVE IMPLEMENTATION GUIDANCE 28

*Annex D.* FEATURE CATALOGUE 29

Annex E. Application Schema Documentation Tables 30

Annex F. VTS-INS dataset validation rules 31

# Overview

## Introduction

This document is a S-100 vector product specification for encoding current and future VTS Digital Information Services.

According to IALA Guideline 1089 on Provision of Vessel Traffic Services provides guidance on the delivery of different types of services provided by a Vessel Traffic Service (VTS). VTS is a service implemented by a Competent Authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with traffic and to respond to traffic situations developing in the VTS area.

VTS Digital Information Services should not be limited to information exchange between ship and shore but also other service providers. This document will include all digital information services that are relevant to VTS operations.

# References

IMO Resolution A.857(20) Guidelines for Vessel Traffic Services [[1]](#footnote-1)

IALA Guideline 1089 Provision of Vessel Traffic Services, edition 1.0 (December 2012) [[2]](#footnote-2)

IALA Recommendation V-145 The Inter-VTS Exchange Format (IVEF) Srevice, edition 1 (June 2011)[[3]](#footnote-3)

IHO S-100 IHO Universal Hydrographic Data Model Edition 4.0.0 (December 2018).

IHO S-101 IHO Electronic Navigational Chart (ENC), Edition 1.0.0 – December 2018

IHO S-124 NAVIGATIONAL WARNINGS, Working Draft – 2.0.0– 2019-07-12

IHO S-127 MARINE TRAFFIC MANAGEMENT, Edition 1.0.0 – December 2018

IHO S-211 Port Call Message Format, [Edition]

IHO S-412 Weather Overlay, Edition and date TBC

IHO S-421 IEC Route Plan Exchange Format, Edition and date TBC

ISO 8601. 2004. Data elements and interchange formats - Information interchange - Representation of dates and times. 2004.

ISO 3166-1. 1997. Country Codes. 1997.

ISO 19101-2:2008 Geographic Information - Rules for Application Schema

ISO/TS 19103:2005 Geographic Information - Conceptual schema language

ISO 19106:2004 Geographic Information – Profiles

ISO 19107:2003 Geographic Information – Spatial schema

ISO 19109:2005 Geographic Information - Rules for Application Schema

ISO 19111:2003 Geographic Information - Spatial referencing by coordinates

ISO 19115-2:2009 Geographic Information - Metadata: Extensions for imagery and gridded data

ISO 19123:2005 Geographic Information - Schema for coverage geometry and functions

ISO 19129:2009 Geographic Information - Imagery gridded and coverage data framework

ISO 19131:2007 Geographic Information - Data product specifications

ISO 19136-2:2015, Geographic Information – Geography Markup Language.

ISO/TS 19139, Geographic Information – Metadata – XML schema implementation.

# Terms, definitions and abbreviations

## Terms and definitions

The S-100 framework is based on the ISO 19100 series of geographic standards. The terms and definitions provided here are used to standardize the nomenclature found within that framework, whenever possible. They are taken from the references cited in clause 2. Modifications have been made when necessary.

**application schema**

**conceptual schema** for data required by one or more **applications** (ISO 19101)

**conceptual model**

modelthat defines concepts of a **universe of discourse** (ISO 19101)

**conceptual schema**

formal description of a **conceptual model** (ISO 19101)

**data product**

**dataset** or **dataset series** that conforms to a **data product specification**

**data product specification**

detailed description of a **dataset** or **dataset series** together with additional information that will enable it to be created, supplied to and used by another party

*NOTE: A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a dataset. It may be used for production, sales, end-use or other purpose.*

**dataset**

identifiable collection of data (ISO 19115)

*NOTE: A dataset may be a smaller grouping of data which, though limited by some constraint such as spatial extent or feature type, is located physically within a larger dataset. Theoretically, a dataset may be as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map or chart may be considered a dataset.*

**domain**

well-defined set (ISO/TS 19103)

*NOTE: Well-defined means that the definition is both necessary and sufficient, as everything that satisfies the definition is in the set and everything that does not satisfy the definition is necessarily outside the set.*

**feature**

abstraction of real world phenomena (ISO 19101)

*NOTE: A feature may occur as a type or an instance. Feature type or feature instance shall be used when only one is meant.*

**feature attribute**

characteristic of a **feature** (ISO 19101)

*NOTE 1: A feature attribute may occur as a type or an instance. Feature attribute type or feature attribute instance is used when only one is meant.*

*NOTE 2: A feature attribute type has a name, a data type and a domain associated to it. A feature attribute for a feature instance has an attribute value taken from the domain.*

**geographic data**

data with implicit or explicit reference to a location relative to the Earth (ISO 19109)

*NOTE: Geographic information is also used as a term for information concerning phenomena implicitly or explicitly associated with a location relative to the Earth.*

**metadata**

data about data (ISO 19115)

**model**

abstraction of some aspects of reality (ISO 19109)

**portrayal**

presentation of information to humans (ISO 19117)

**quality**

totality of characteristics of a product that bear on its ability to satisfy stated and implied needs (ISO 19101)

## Abbreviations

CRS Coordinate Reference System

DCEG Data Classification and Encoding Guide

ECDIS Electronic Chart Display and Information System

ENC Electronic Navigational Chart

GML Geography Markup Language

IALA International Association of Marine Aids to Navigation and Lighthouse Authorities

IHO International Hydrographic Organization

IMO International Maritime Organization

ISO International Organization for Standardization

UML Unified Modeling Language

URI Uniform Resource Identifier

URL Uniform Resource Locator

VTS Vessel Traffic Service System

VTS-INS VTS Information Service

WMS Web Map Service

WWW World Wide Web

XML Extensible Markup Language

XSLT eXtensible Stylesheet Language Transformations

# Product specification metadata

|  |  |
| --- | --- |
| **Title** | VTS Digital Information Service Product Specification |
| **Version** | 0.6.0 |
| **S-100 version** | 4.0.0 |
| **Date** | 01 September 2019 |
| **Language** | English |
| **Identifier** | TBD |
| **Classification:** | **001 - unclassified** |
| **Contact:** | TBD |
| **URL:** | TBD |
| **Maintenance:** | IALA |

## IALA Product Specification Maintenance

This chapter is for clarification only on PS Maintenance.

### Introduction

Changes to a product specification will be released by IALA-AISM as a new edition, revision, or clarification.

### New Edition

New editionsof a product specification introduce significant changes. *New editions* enable new concepts, such as the ability to support new functions or applications, or the introduction of new constructs or data types.

### Revisions

*Revisions* are defined as substantive semantic changes to a product specification. Typically, revisions will change a product specification to correct factual errors; introduce necessary changes that have become evident as a result of practical experience or changing circumstances. A *revision* must not be classified as a clarification. *Revisions* could have an impact on either existing users or future users of a product specification. All cumulative *clarifications* must be included with the release of approved corrections.

Changes in a revision are minor and ensure backward compatibility with the previous versions within the same edition. Newer revisions, for example, introduce new features and attributes. Within the same edition, a data product of one version could always be processed with a later version of the feature and portrayal catalogues.

### Clarification

Clarifications are non-substantive changes to a product specification. Typically, clarifications: remove ambiguity; correct grammatical and spelling errors; amend or update cross references; insert improved graphics, spelling, punctuation and grammar. A clarification must not cause any substantive semantic change to a product specification.

Changes in a clarification are minor and ensure backward compatibility with the previous versions within the same edition. Within the same edition, a data product of one clarification version could always be processed with a later version of the feature and portrayal catalogues, and a portrayal catalogue can always rely on earlier versions of the feature catalogues.

### Version Numbers

The associated version control numbering to identify changes (n) to a product specification must be as follows:

New editions denoted as **n**.0.0

Revisions denoted as n.**n**.0

Clarifications denoted as n.n.**n**

# Specification Scope

This product specification describes one data product and therefore requires only one scope which is described below:

**Scope ID:** VTS Digital Information Service datasets.

**Hierarchical level:** MD\_ScopeCode - 005

**Hierarchical level name:** dataset.

**Level description:** information applies to the dataset

**Extent:** EX\_Extent.description: Global coverage of maritime areas

# Data Product Identification

## Dataset Identification

|  |  |
| --- | --- |
| **title** | VTS Digital Information Service |
| **abstract** | According to IALA Guideline 1089 on Provision of Vessel Traffic Services provides guidance on the delivery of different types of services provided by a Vessel Traffic Service (VTS). VTS is a service implemented by a Competent Authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with traffic and to respond to traffic situations developing in the VTS area.  VTS Digital Information Services should not be limited to information exchange between ship and shore but also other service providers. |
| **content** | Communication message with VTS, Such as ship state information, accident information, environmental information and warning information in VTS area |
| **geographicDescription** | EX\_GeographicDescription: Examples: country; official name of region if any |
| **spatialResolution** | MD\_Resolution>levelOfDetail (CharacterString): “All scales” |
| **purpose** | This PS is in support to the VTS Maritime Services to exchange data with VTS Digital Information Services and to create the means to reduce administrative burden and information overload, reduce miscommunication due to external interference, simplify work procedures, promote sustainable shipping, and increase navigational safety.  Details about digital information exchange could be published by the Competent Authority. |
| **language** | EN |

# Data Content and structure

## Introduction

The VTS Digital Information Service product specification is based on the S-100 General Feature Model (GFM), and is a feature-based vector product. All VTS Digital Information Service features and information classes are derived from one of the abstract classes **FeatureType** and **InformationType** defined in the VTS Digital Information Service application schema, which realize the GFM meta-classes **S100\_GF\_FeatureType** and **S100\_GF\_InformationType** respectively.

VTS Digital Information Service features are encoded as vector entities which conform to S-100 geometry configuration level 3b (S-100 clause 7-5.3.5). VTS Digital Information Service further constrains Level 3a with the following:

* Coincident linear geometry must be avoided when there is a dependency between features.
* The interpolation of arc by centre point and circle by centre point curve segments must be circular arcs with centre and radius, as described in S-100 §§ 7-4.2.1, 7-4.2.20, and 7-4.2.21.
* The interpolation of other GM\_CurveSegment must be loxodromic.
* Linear geometry is defined by curves which are made of curve segments. Each curve segment contains the geographic coordinates as control points and defines an interpolation method between them. The distance between two consecutive control points must not be less than 0.3 mm at a display scale of 1:10000.

The following exception applies to VTS-INS:

• The use of coordinates is restricted to two dimensions (DirectPosition is restricted to two coordinates).

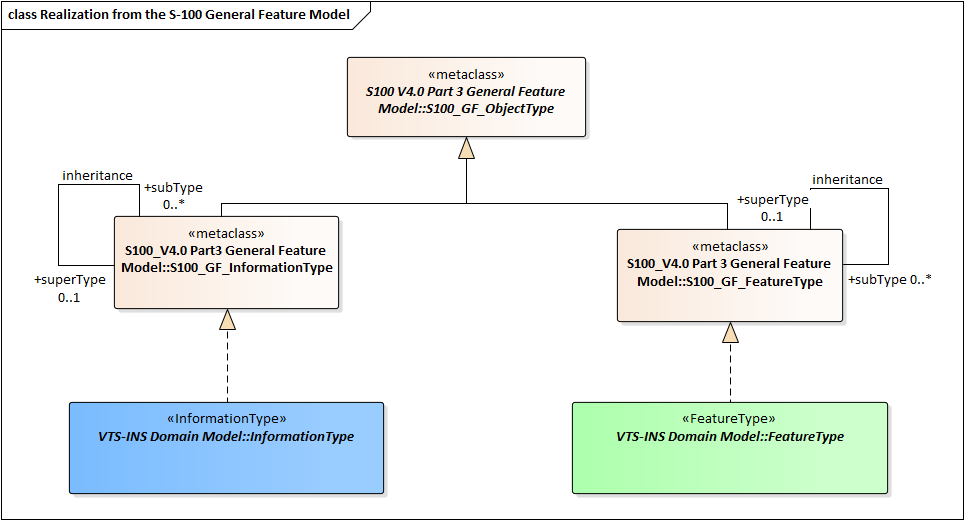


Figure 7-1 Realizations from the S-100 General Feature Model

This clause contains the Application Schema expressed in UML and an associated Feature Catalogue.

## Application Schema

The UML models in this clause are segments of the overall VTS Digital Information Service application schema, and include overviews of the feature classes, information classes, spatial types, and the relationships between them.

This clause contains a general overview of the classes and relationships in the VTS Information Service application schema. Detailed information about how to use the feature types and information types to encode VTS-INS is provided in the VTS-INS Data Classification and Encoding Guide (DCEG).

The following conventions are used in the UML diagrams depicting the application schema:

* Standard UML conventions for classes, associations, inheritance, roles, and multiplicities apply. These conventions are described in Part 1 of S-100.
* Italic font for a class name indicates an abstract class.
* Feature classes are depicted with green background; the dark shade for abstract feature classes and the light shade for ordinary (non-abstract) feature classes.
* Information type classes are depicted with blue background; the dark shade for abstract information type classes and the light shade for ordinary information types.
* Complex attributes are depicted with a pink background.
* Enumeration lists and codelists are depicted with a tan background. The numeric code corresponding to each listed value is shown to its right following an ‘=’ sign.
* No significance attaches to the colour of associations. (Complex diagrams may use different colours to distinguish associations that cross one another.)
* Where the association role or name is not explicitly shown, the default rules for roles and names apply:
* The role name is ‘the<CLASSNAME>’ where <CLASSNAME> is the name of the class to which that association end is linked.
* The association name is ‘<CLASSNAME1>\_<CLASSNAME2>’ where <CLASSNAME1> is the source and <CLASSNAME2> the target. In case of a feature/information association the feature is the source.
* For feature/feature or information/information associations without explicit names the source/target are indicated by an arrowhead.
* Subclasses inherit the attributes and associations of their superclasses at all levels, unless such inheritance is explicitly overridden in the subclass.

### Domain Model

#### Overview of Domain Features and Information Types

The VTS Digital Information Service data product consists of information related to the vessel and the environment within the VTS Area, either delivered to the VTS Operator or made up of messages that the operator must deliver. The information related to the vessel is composed of static information of the vessel, dynamic information of the vessel, accident information of own ship, and status of navigational equipment. The information in the VTS Area consists of status information within the VTS Area and Warning information.

The figure 7-2 shows the overview picture of the feature and information type of the VTS Information Service domain model.

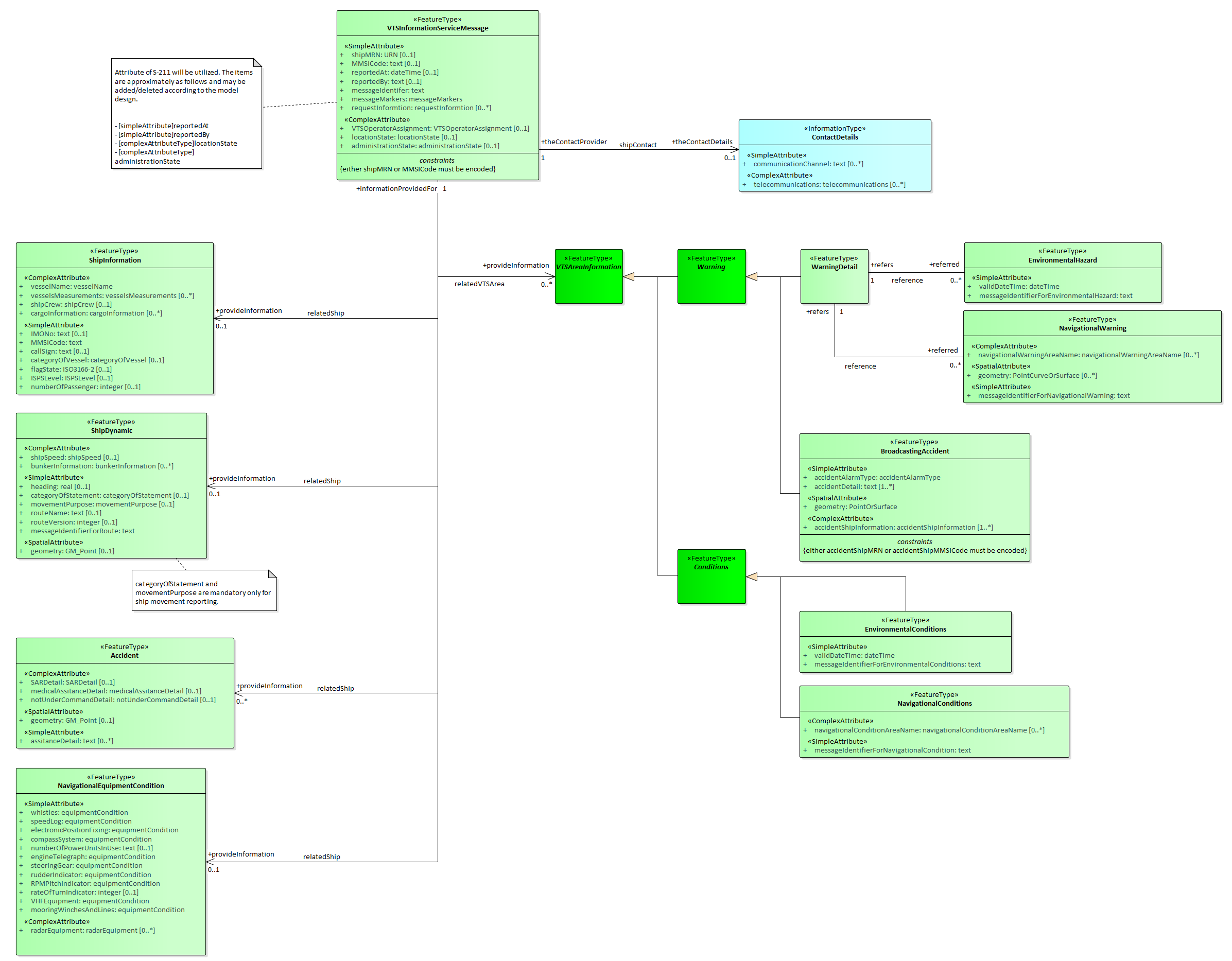


Figure 7-2 Overview of VTS-INS Feature and Information Types

* VTSInformationServiceMessage is a feature type. Classes for distinguishing information that is sent. Manage requests, responses to requests, and results of service requests, or distinguish which information is transmitted from broadcasting information. Ships can be reported to VTS in this class and transmitted with requested information, while VTS can transmit with answer information in this class.
* ShipInformation is a feature type. Static information/information that does not change when a ship is operated in one voyage.
* ShipDynamic is a feature type. Dynamic information/information that may change or change when a ship is operated in one voyage.
* Accident is a feature type. Class to communicate own vessel accident information. The purpose of this class is to provide emergency information about ship accidents prior to VTS communication.
* NavigationalEquipmentCondition is a feature type. Mechanical defects/An item to manage the condition of items to determine whether mechanical defects that can affect the normal operation of a ship are present.
* BroadcastingAccident is a feature type. Class that contains information to inform the surrounding vessel of accident information or information about the vessel requesting assistance.
* VTSareaInformation is an abstract type that collects properties common to Warning and Condition within the VTS Area, while Warning and Condition are abstract types that collect common properties of Warning and Status information within the VTS Area, respectively.
* NavigationalWarning is a feature type. Navigation warning in the VTS Area from VTS Operator. Use S-124 to get information.
* EnvironmentalHazard is a feature type. Environmental hazard Information in the VTS Area from VTS Operator. Use S-412 to get information.
* EnvironmentalConditions is a feature type. Environmental condition Information in the VTS Area from VTS Operator. Use S-412 to get information.
* NavigationalConditions is a feature type. Navigation conditions in the VTS Area from VTS Operator. Use S-127 to get information.
* ContactDetails is an information type. Information on how to reach a person or organisation by postal, internet, telephone, telex and radio systems.
* VTS Information Service Message-related Ship Information associations are modelled by the association labelled relatedShip, between classes VTSInformationServiceMessage and ShipInformation, ShipDynamic, Accident, NavigationalEquipmentCondition in Figure 7-2.
* VTS Information Service Message-related VTS Area Information associations are modelled by the association labelled relatedVTSArea, between classes VTSInformationServiceMessage and VTSAreaInformation in Figure 7-2.

#### VTS-INS Complex Attributes

The complex attributes in the VTS Information Service domain are provided in Figures 7-3.

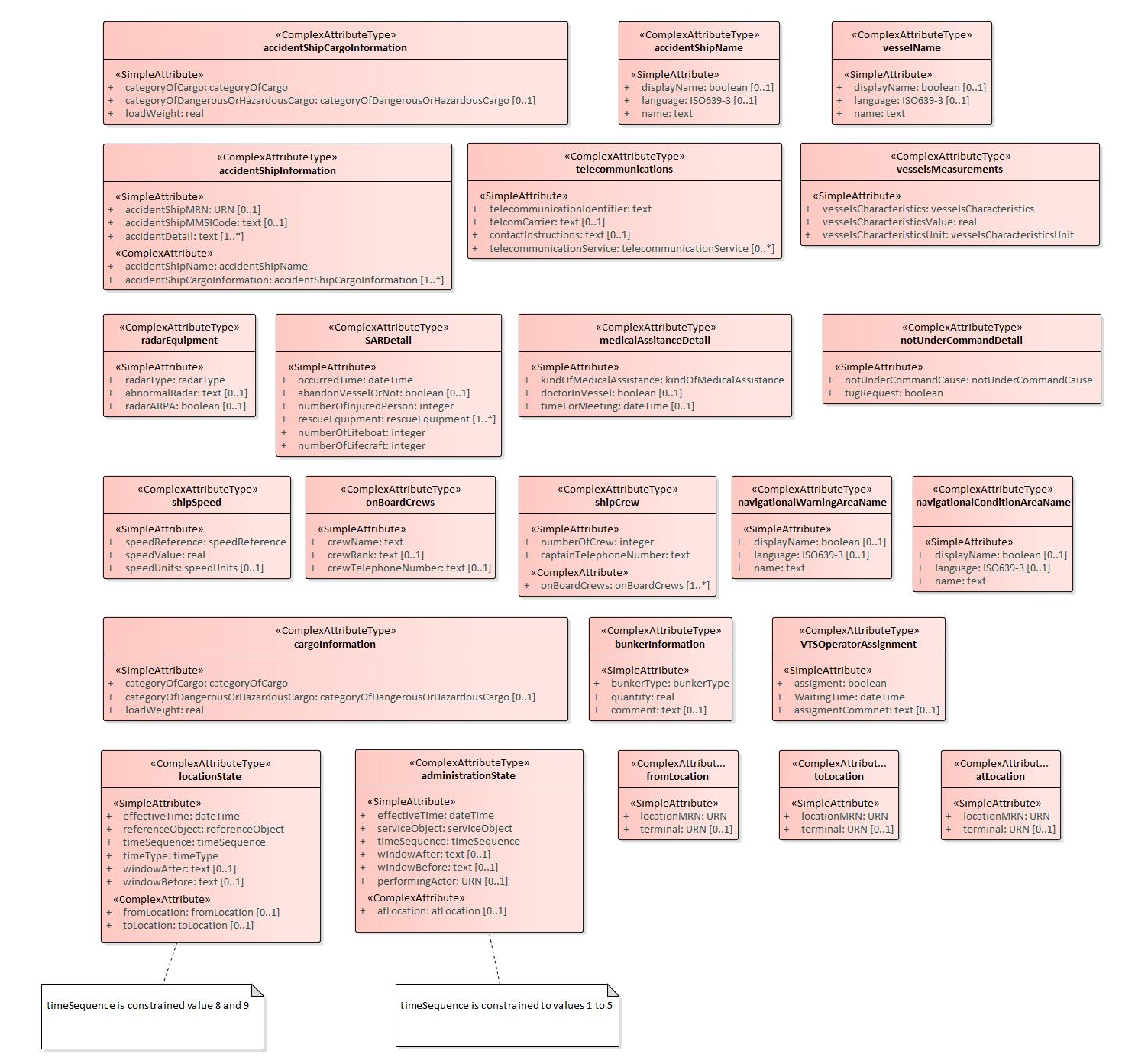


Figure 7-3 VTS-INS Complex Attributes

#### VTS-INS Enumerations and Codelists

For completeness, the enumerations and codelists in the VTS Information Service domain are provided in Figures 7-4.

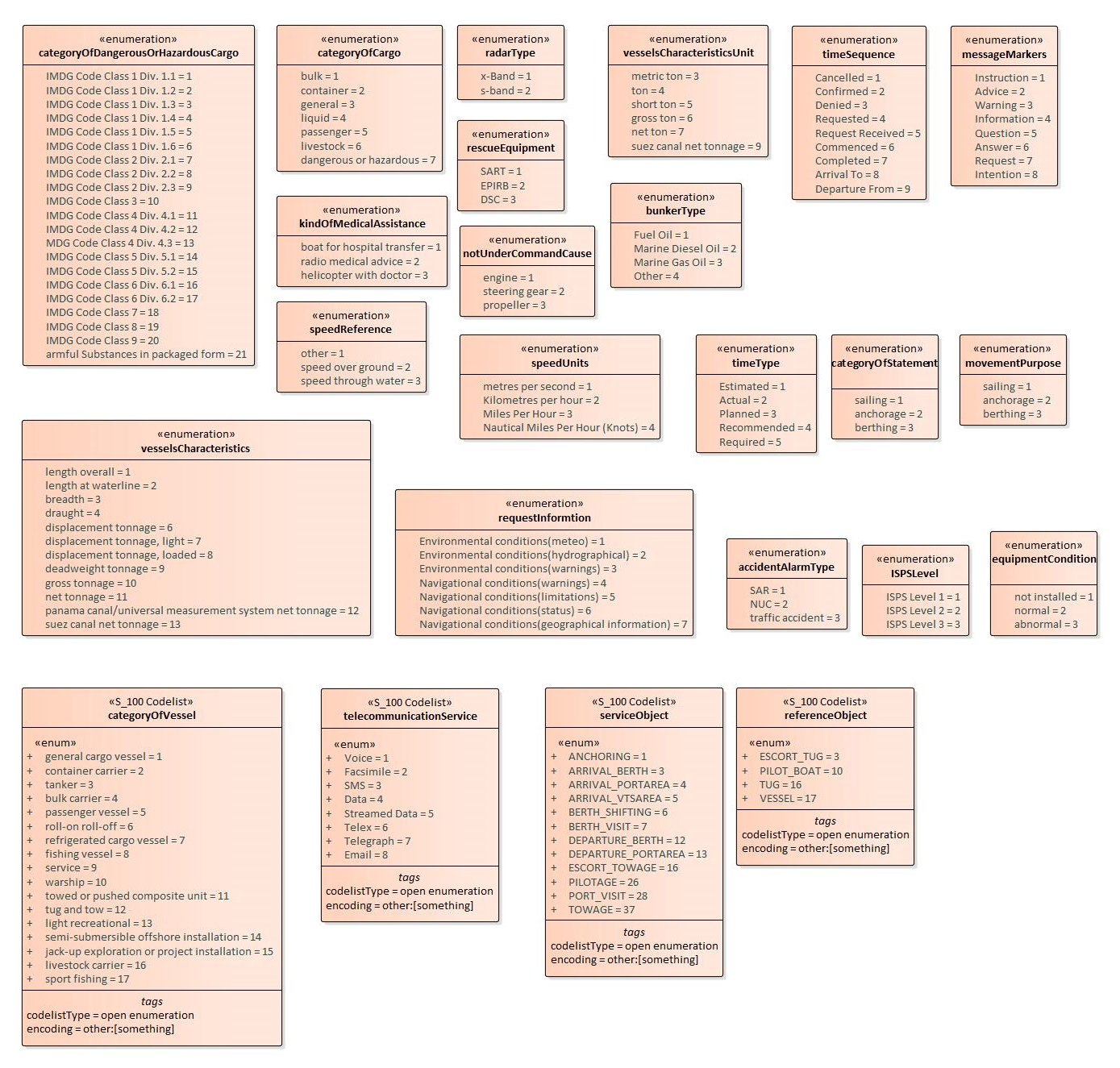


Figure 7-4 VTS-INS enumerations and codelists

### Meta features application schema

This data product does not make use of meta-features.

## Feature Catalogue

The Feature Catalogue describes the feature types, information types, attributes, attribute values, associations and roles which may be used in the product. The VTS Information Service Feature Catalogue is available in an XML document which conforms to the S-100 XML Feature Catalogue Schema. A printed version of the feature catalogue is provided in Annex #(TBD).

## Feature Types

Feature types contain descriptive attributes and do not contain any geometry (i.e. information about the shape and position of a real-world entity). Features have two aspects – feature type and feature instance. A feature type is a class and is defined in a Feature Catalogue. A feature instance is a single occurrence of the feature type and represented as an object in a dataset. A feature instance is located by a relationship to one or more spatial instances. A feature instance may exist without referencing a spatial instance.

VTS-INS makes use of the following feature types:

Geographic (Geo) feature type – carries the descriptive characteristics of a real world entity.

Relationship feature type – A feature relationship links instances of one feature type with instances of the same or a different feature type.

# Co-ordinate Reference Systems (CRS)

## Introduction

The location of an object in the S-100 standard is defined by means of coordinates which relate a feature to a position. The coordinate reference system used for this product specification is World Geodetic System 1984 (WGS 84) which is defined by the European Petroleum Survey Group (EPSG) code 4326.

Spatial data are expressed as latitude (φ) and longitude (λ) geographic coordinates. Latitude values are stored as a negative number to represent a position south of the Equator. Longitude values are stored as a negative number to represent a position west of the Prime Meridian. Coordinates are expressed as real value, degree / degree decimal format. Datasets conforming to this product specification are not projected.

**Horizontal coordinate reference system:** WGS 84

**Projection:** None

**Vertical coordinate reference system:** None

**Temporal reference system:** Gregorian calendar

**Coordinate reference system registry:** EPSG Geodetic Parameter Registry

**Date type (according to ISO 19115-1):** 002 - publication

## Horizontal Reference System

Positional data is expressed in latitude and longitude geographic coordinates to one of the reference horizontal reference systems defined in the HORDAT attribute. Unless otherwise defined, the World Geodetic System 84 (WGS 84) will be used for VTS-INS data products.

## Projection

VTS-INS data products are un-projected.

## Vertical Coordinate Reference System

VTS-INS data products do not provide detailed vertical information.

## Temporal Reference System

Time is measured by reference to Calendar dates and Clock time in accordance with ISO 19108:2002 Temporal Schema clause 5.4.4.

## VTS Information Service Data and Scale

VTS Information Service data must be compiled in the best applicable scale. The use of the data itself is "scale independent". That means that the data can be used at any scale. S-100 allows the association of multiple spatial attributes to a single feature instance. In principle, each of these spatial attributes can be qualified by maximum and minimum scales.

For example, it is possible, within one dataset, to have a single instance of a feature that has more than one area geometry. Each of these geometries has different scale max/min attributes. Moreover, due to cluttering in smaller scales, the scale minimum attribute may be used to turn off portrayal of some features at smaller scales.

# Data Quality

VTS Information Service datasets must be validated using the conformance checks that are listed in Annex #(TBD). Prior to release by the data producer. The data producer must review the check results and address any issues to ensure sufficient quality of the data products. The checks are a mix of data format validation checks, conformance to standard checks and logical consistency checks.

# Data Capture and Classification

The Data Capture and Classification (DCEG) is found in Annex #(TBD).

# Data Maintenance

# Data Product format (encoding)

## Introduction

Detailed documentation of the VTS-INS encoding schema is provided in Annex #(TBD) of this document.

Format Name: XML, Specification: custom.

**File Structure: (VTS-INS Product Specification), Annex #(TBD).**

## Numeric Attribute Encoding

Floating point and integer attribute values must not contain leading zeros. Floating point attribute values must not contain non-significant trailing zeros.

## Text Attribute Values

Character strings must be encoded using the character set defined in ISO 10646-1, in Unicode Transformation Format-8 (UTF-8).

## Mandatory Attribute Values

Some attribute values are considered mandatory for the following reasons:

* Certain messages make no logical sense without specific attributes,
* Some attributes are necessary to determine which symbol is to be displayed,

All mandatory attributes are identified in the Feature Catalogue and summarised in Annex #(TBD) – Data Classification and Encoding Guide.

## Unknown Attribute Values

It is an error for a mandatory attribute value to be missing. Mandatory attributes cannot be “nilled”.

Optional attributes must be omitted altogether if the value is unknown or missing.

## Structure of dataset files

A ‘dataset’ in this product is a message that consists of a single object encoded as an XML element VTSInformationServiceMessage.

This product references datasets from other standard documents (S-124, S-127, S-412, and S-421). Datasets of other standard documents do not exist separately in several files. They are nested in VTS-INS Dataset as shown in Figure 12-1 using Attributes that can function as Message Identifier.

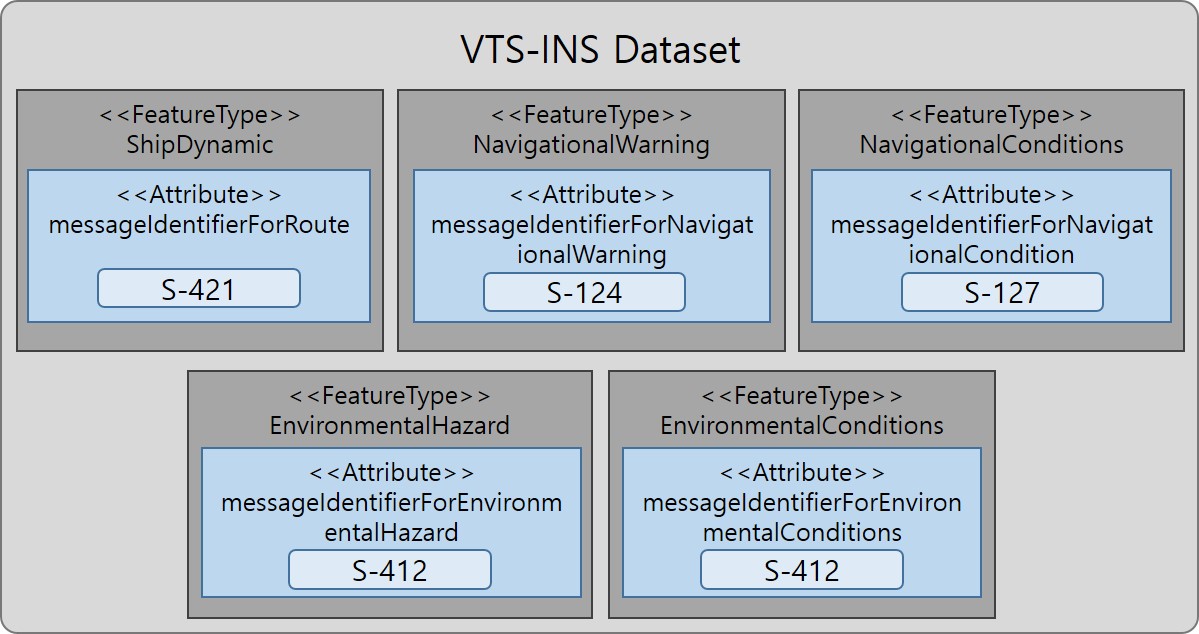


Figure 12-1 VTS-INS Dataset with Other Standard Documents

Collections of objects may be wrapped. This wrapping is out of the scope of this product specification.

## Message object identifiers

Each message object is identified by a **messageIdentifier** based on URN format, in accordance with RFC 4122. This allows us to assign message identifiers in a distributed manner with no centralised id management and still be guaranteed that all message identifiers are globally unique. As a result, any message that is sent has an identifier. Since a VTS-INS dataset consists of a single message, the ID of the single message object in a dataset is the same as the ID of the dataset.

GML geometric primitives (inline or external) are required to have a **gml:id** attribute with a value that is unique within the file (dataset or collection). The **gml:id** values must be used as the reference for the object from another object in the same dataset or another dataset. Applications must therefore take care to generate a unique gml:id for each point encoded as coordinates.

## Dataset validation

Fields may be repeated or omitted as permitted by the XML schemas and the validation tests. Since XML schema cannot encode rules for conditional presence or attributes, these rules must be checked by other validation code in the implementation.

Schematron rules are another possibility for validation code, but are not defined in this specification since the ability of implementations to integrate Schematron validation is unknown. Implementers may create and implement their own Schematron validation rules.

## Location of Data Product Format schema Files

The schema file will provide a future location and is available from that location.

## Detailed documentation of schema

The detailed documentation of the schema is in Annex #(TBD) (currently a separate document enclosed with this file).

# Data Product Delivery

This clause specifies the encoding and delivery mechanisms for a VTS-INS dataset. Data which conforms to this product specification must be delivered by means of an exchange set.

There are only two delivery modes for VTS-INS data – single messages and collections. In either delivery mode, the content may be encapsulated into a form suitable for transmission by a mapping called a transmission encoding. An encoding translates each of the elements of the content (e.g., exchange set) into a logical form suitable for writing to media and for transmission online. An encoding may also define other elements in addition to the exchange set contents (i.e., media identification, etc…) and also may define commercial constructs such as encryption and compression methods.

Examples: REST; MIME-encoded email; zip files.

If the data is transformed (e.g., for encryption or compression purposes) its content must not be changed.

This product specification does not define the transmission encoding which must be used as a default for transmission of data between parties.

## Message datasets

VTS-INS Datasets are delivered as single messages transmitted to a service broker via an appropriate delivery mechanism, e.g., REST API.

**Units of Delivery**: Message

**Transfer Size**: 10kb maximum

**Medium Name**: Digital data delivery

**Other Delivery Information**:

Each delivery packet must contain a single VTS-INS Message.

Exchange catalogues are not included.

The allowed components are as follows:

Mandatory Elements

* VTS-INS Message – XML encoding of single VTS-INS Message.

Optional Elements: None.

## Collections

VTS-INS Collections are transferred as collections of messages transmitted via an appropriate delivery mechanism, e.g., REST API.

**Units of Delivery**: Collection

**Transfer Size**: 20MB

**Medium Name**: Digital data delivery

**Other Delivery Information**:

Each collection may contain zero or more VTS-INS objects.

Exchange catalogues are not included.

The allowed components are as follows:

Mandatory Elements

* VTS-INS Message– XML encoding of VTS-INS features/attributes and their associated geometry and metadata.
* Collection wrapper – as specified by the service broker API.

Optional Elements: None

## Dataset distribution

### Datasets

Datasets are distributed as files as described in this specification. The distribution media are left to the discretion of the producer and distributor.

**The VTS Information Service product specification does not mandate implementation of the API or service broker.**

### Dataset size

Single messages must not exceed 10kb. Collections must not exceed 20 MB.

### Dataset file naming

If VTS-INS data is communicated in the form of dataset files containing a single VTS-INS message in each file, the files shall be named <MESSAGEIDENTIFIER>.XML

Where <MESSAGEIDENTIFIER> must be upper case.

NOTE: The letter cases of the file name and the messageIdentifier encoded within the message are not guaranteed to be the same. E.g., the internal messageIdentifier may use lower case letters, or mixed case, or may have only some letters in uppercase, etc.

## Support Files

The supported file types allowed for VTS-INS are files for the transfer of Route, Navigation Warning, Navigational Conditions, Environmental Hazard, and Environmental Conditions. These files are identified within the VTS-INS data set by the following attribute:

|  |  |  |
| --- | --- | --- |
| Type | Attribute Name | Attribute in Standard Documents |
| Simple Attribute | routeName | Using the value of S-421.Route.routeInfoName |
| Simple Attribute | routeVersion | Using the value of S-421.RouteHistory.routeHistoryEditionNo |
| Simple Attribute | validDateTime | Using the value of S-412.S412\_FeatureType.validDateTime |
| Complex Attribute | navigationalConditionAreaName | Using the value of S-127.FeatureType.featureName |
| Complex Attribute | navigationalWarningAreaName | Using the value of S-124.S124\_FeatureType.featureName |

## Exchange Catalogue

The exchange catalogue prescribed by S-100 is not used in the VTS-INS specification and is not transmitted with VTS-INS messages. This is to reduce demands on bandwidth and the complexity of generation and handling of VTS-INS.

# Metadata

Metadata prescribed by S-100 is not transmitted with VTS-INS messages. This is to reduce demands on bandwidth and the complexity of generation and handling of VTS-INS.

For this reason there is no metadata defined in this specification.

# Use of other standard documents in VTS-INS

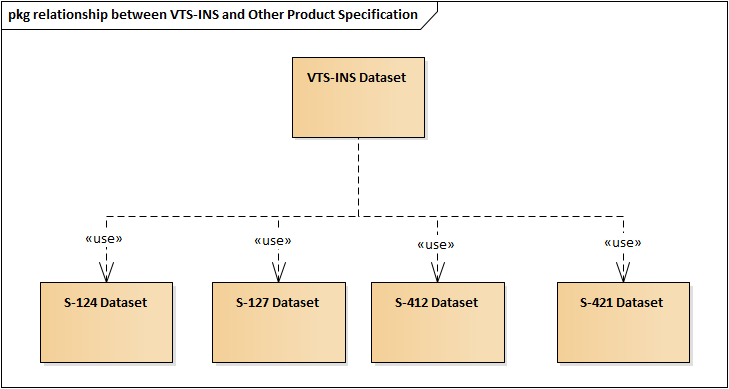


Figure 15-1 relationship between VTS-INS and Other Product Specification

The VTS Information Service uses S-421 to transmit route information and S-412 to transmit weather and environmental information within the VTS Area. And S-124 is used to transmit navigation warning and S-127 to transmit navigational conditions.

Figure 15-1 shows the relationship between VTS-INS and S-124, S-127, S-412, and S-421.

# Language

The exchange language must be English. Other languages may be used as a supplementary option. National geographic names can be left in their original national language using the complex attribute Feature Name.

Character strings must be encoded using the character set defined in ISO 10646-1, in Unicode Transformation Format-8 (UTF-8). A BOM (byte order mark) must not be used.

# Acknowledgements

1. Data Classification and Encoding Guide

[To be developed in the next version]

1. Data Product Format (Encoding)

[*To be developed in the next version*]

1. NORMATIVE IMPLEMENTATION GUIDANCE

*IALA to determine if this annex is needed.*

1. FEATURE CATALOGUE

*[To be developed in the next version.]*

1. Application Schema Documentation Tables

[*To be developed in the next version*.]

1. VTS-INS dataset validation rules

[*To be developed in the next version*.]

1. Currently being revised [↑](#footnote-ref-1)
2. To be revised [↑](#footnote-ref-2)
3. A product specification (S-210) has to be created [↑](#footnote-ref-3)