

**IALA S-211**

**Product Specification**

**Draft 1.0.0 – 28 March 2019**

IALA Port Call Message Product Specification

Annex A

Data Classification and Encoding Guide

**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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# Overview

## Preface

The “Data Classification and Encoding Guide” has been developed to provide consistent, standardized instructions for encoding Port Call Message (PCM) (S-211) data.

The purpose of the Data Classification and Encoding Guide is to facilitate S-211 encoding to meet IALA standards for the exchange of Port Call Messages. This document describes how to encode information that the modeller considers relevant. The content of a PCM is at the discretion of the producer provided that the conventions described within this document are followed.

The entire S-100 Universal Hydrographic Data Model is available at the following web site, http://www.iho.int.

## S-211 Appendix A - Data Classification and Encoding Guide – Metadata

Note: This information uniquely identifies this Data Classification and Encoding Guide to the Product Specification and provides information about its creation and maintenance.

|  |  |
| --- | --- |
| **Metadata** | **Content** |
| **Title:** | The IALA Port Call Message Product Specification, Data Classification and Encoding Guide |
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| **Identifier:** | S-211 Appendix A Data Classification and Encoding Guide |
| **Maintenance:** | Changes to S-211 Appendix A; Data Classification and Encoding Guide are coordinated by IPCDMC . |

Table 1‑1 Product specification metadata

## Terms and definitions

|  |  |
| --- | --- |
| **Term** | **Definition** |
| **aggregation** | special form of **association** that specifies a whole-part relationship between the aggregate (whole) and a component (see composition) |
| **application** | manipulation and processing of data in support of user requirements (ISO 19101) |
| **application schema** | **conceptual schema** for data required by one or more **applications** (ISO 19101) |
| **association** | semantic relationship between two or more classifiers that specifies connections among their instances  NOTE:  A binary association is an association among exactly two classifiers (including the possibility of an association from a classifier to itself) |
| **attribute** | named property of an entity  NOTE:  Describes the geometrical, topological, thematic, or other characteristic of an entity |
| **boundary** | set that represents the limit of an entity (ISO 19107) |
| **composition** | special form of **association** that specifies a “strong aggregation”.  In a composition association, if a container object is deleted then all of the objects it contains are deleted as well. |
| **Conceptual model** | model that defines concepts of a **universe of discourse** (ISO 19101) |
| **conceptual schema** | formal description of a **conceptual model** (ISO 19101) |
| **coverage** | **feature** that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal **domain** (ISO 19123)  *EXAMPLE Raster image, polygon overlay, digital elevation matrix.* |
| **Curve** | 1-dimensional **geometric primitive**, representing the continuous image of a line  NOTE: The **boundary** of a **curve** is the **set** of **points** at either end of the **curve**. If the **curve** is a cycle, the two ends are identical, and the **curve** (if topologically closed) is considered to not have a boundary. The first **point** is called the **start point**, and the last **point** is the **end point**. Connectivity of the curve is guaranteed by the “continuous image of a line” |
| **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 contained within a larger dataset. A hardcopy map or chart may be considered a dataset.* |
| **Dataset series** | collection of **datasets** sharing the same product specification (ISO 19115) |
| **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.* |
| **End point** | last point of a curve (ISO 19107) |
| **enumeration** | a fixed list which contains valid identifiers of named literal values. Attributes of an enumerated type may only take values from this list. |
| **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.*  EXAMPLE:  The feature instance named “Turning Torso Tower” may be classified with other phenomena into a feature type “tower”. |
| **Feature association** | relationship that links instances of one **feature** type with instances of the same or a different **feature** type (ISO19110)  *NOTE 1; A feature association may occur as a type or an instance. Feature association type or feature association instance is used when only one is meant.*  *NOTE 2: Feature associations include aggregation of features.* |
| **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.* |
| **Geometric primitive** | geometric object representing a single, connected, homogeneous element of geometry  NOTE:  Geometric primitives are non-decomposed objects that present information about geometric configuration. They include **points, curves,** surface |
| **maximum display scale** | the largest value of the ratio of the linear dimensions of features of a dataset presented in the display and the actual dimensions of the features represented (largest scale) of the scale range of the dataset |
| **metadata** | data about data (ISO 19115) |
| **minimum display scale** | the smallest value of the ratio of the linear dimensions of features of a dataset presented in the display and the actual dimensions of the features represented (smallest scale) of the scale range of the dataset |
| **model** | abstraction of some aspects of reality (ISO 19109) |
| **point** | 0-dimensional geometric primitive, representing a position  NOTE:  The **boundary** of a point is the empty set |
| **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) |
| **set** | unordered collection of related items (objects or values) with no repetition (ISO 19107) |
| **start point** | first point of a curve (ISO 19107) |
| **surface** | connected 2-dimensional geometric primitive, representing the continuous image of a region of a plane  NOTE:  The boundary of a surface is the set of oriented, closed **curves** that delineate the limits of the surface |
| **universe of discourse** | view of the real or hypothetical world that includes everything of interest (ISO 19101) |

Table 1‑2 List of terms and definitions

## Abbreviations

|  |  |
| --- | --- |
| **Abbreviation** | **Description** |
| DCEG | Data Classification and Encoding Guide |
| ECDIS | Electronic Chart Display and Information System |
| ENC | Electronic Navigational Chart |
| GML | Geography Markup Language |
| HO | Hydrographic Office |
| IALA | International Association of Marine Aids to Navigation and Lighthouse Authorities |
| IHO | International Hydrographic Organization |
| IMO | International Maritime Organization |
| IPCDMC | International Port Collaborative Decision Making Council |
| ISO | International Organization for Standardization |
| PCM | Port Call Message |
| REST | Representational State Transfer |
| STM | Sea Traffic Management |
| UML | Unified Modelling Language |
| URL | Universal Resource Locator |
| URN | Uniform Resource Name |
| XML | eXtensible Markup Language |

Table 1‑3 List of abbreviations

## Use of language

Within this document:

“Must” indicates a mandatory requirement;

“Should” indicates an optional requirement, that is the recommended process to be followed, but is not mandatory;

“May” means “allowed to” or “could possibly”, and is not mandatory, or recommended.

## Maintenance

Changes to the Data Classification and Encoding Guide must occur in accordance with the S-211 PCM Product Specification clause 4.1.

# General

## Introduction

This S-211 Data Classification and Encoding Guide (DCEG) contains rules and guidance for the content of port call messages.

The S-211 specification contains an application schema (UML model) describing the conceptual domain model in terms of classes and relationships, and a Feature Catalogue (see S-211 Annex B) that specifies the data model, i.e., specifies the data model types and associations corresponding to the various classes and relationships in the application schema.

To simplify the DCEG text, the various data model types will be provided without the suffixes “class”, “type” or “instance”; e.g. the term “feature” should be understood as “feature class” or “feature type” or “feature instance” as best fits the immediate context in which it is used (and where there might be confusion, it is written out in full as feature class/type/instance). The model defines real world entities as a combination of descriptive and spatial characteristics (S-211 PCM Product Specification clause 4.4).

This section of the DCEG contains general information needed to understand the encoding rules and describes fundamental common rules and constraints. It also describes datasets and metadata. The data model object types used within S-211 and their encoding rules and guidelines are defined in detail in subsequent sections of this document.

Within this document the features, information types, associations and attributes appear in **bold text**.

## Descriptive characteristics

### Feature

A feature contains descriptive attributes that characterize real world entities.

The word ‘feature’ as used in the ISO 191xx series and in S-100 based product specifications has two distinct but related senses – ‘feature type’ and ‘feature instance’. A feature instance is a single occurrence of the feature and is represented as an object in a dataset.

The location of a feature instance on the Earth’s surface is indicated by a relationship to one or more spatial primitive instances. A feature instance may exist without referencing a spatial primitive instance.

#### Geographic feature class

**Geographic (Geo) feature types** carry the descriptive characteristics of a real world entity which is provided by a spatial primitive instance. PCMF contains only geo features, and therefore only these are described here.

## Spatial characteristics

### Spatial primitives

No spatial primitives are used in S-211

Within this document, allowable spatial primitives are included in the description of the feature. For easy reference, Table 2‑1 below summarises the allowable spatial primitives for each feature. In the table, abbreviations are as follows: point (P), curve (C) and surface (S).

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **P** | **C** | **S** |
| Port Call Message |  |  |  |

Table 2‑1 Features permitted for PCM and their spatial primitives

## Attributes

Attributes may be simple type or complex type. Complex (C) attributes are aggregates of other attributes that can be simple type or complex type attributes. Simple (S) attributes are assigned to one of the types collected at clause 2.4.1.

The binding of attributes to a feature, the binding of attributes to attributes to construct complex attributes, and attribute multiplicity are all defined in the Feature Catalogue.

Within this document, the allowable attributes are included in the description of each feature, as well as the allowable values for enumeration type attributes.

### Simple attribute types

Each simple attribute (S) is assigned to one of attribute types in Table 2‑2 (in alphabetic order):

|  |  |  |
| --- | --- | --- |
| **Abbre- viation** | **Attribute type** | **Description** |
| DA | Date | A date provides values for year, month and day according to the Gregorian Calendar.  Example: 19980918 (YYYYMMDD) |
| DT | Date and Time | A DateTime is a combination of a date and a time type.  Example: 19850412T101530 (YYYYMMDDThhmmss) |
| EN | Enumer-ation | A fixed list of valid identifiers of named literal values. Attributes of an enumerated type may only take values from this list. |
| TE | Free text | A CharacterString is an arbitrary-length sequence of characters including accents and special characters from a repertoire of one of the adopted character sets. |
| TI | Time | A time is given by an hour, minute and second. Time zone according to UTC is optional. Character encoding of a time is a string that follows the local time  Example: 183059 or 183059+0100 or 183059Z |
| URN | URN | A persistent, location-independent, resource identifier that follows the  syntax and semantics for URNs specified in RFC 2141.  EXAMPLE urn:iho:s101:1:0:0:AnchorageArea |

Table 2‑2 Simple attribute types

### Mandatory attributes

Some attributes are mandatory and must be populated because messages cannot be processed without specific attributes.

Within this document, mandatory attributes are those with a multiplicity of 1,1 or 1,n (n>1) or 1,\*. The attribute multiplicity is identified in the description of each feature class.

For easy reference, the Table 1‑2 summarises the mandatory attributes for each feature and complex attribute.

| **Feature / Complex attribute** | **Mandatory Attributes** |
| --- | --- |
| Port Call Message | messageId; exactly one of locationState, serviceState, administrationState, or messageOperation |
| locationState | referenceObject, time, timeSequence, timeType; at least one of fromLocation and toLocation |
| serviceState | serviceObject, time, timeSequence, timeType; one of atLocation or betweenLocations |
| administrationState | serviceObject, time, timeSequence, timeType; one of atLocation or betweenLocations |
| messageOperation | messageId, categoryOfMessageOperation |
| betweenLocations | fromLocation, toLocation |

Table 2‑3 Mandatory attributes for PCM feature classes

### Conditional attributes

Attributes for location and timeSequence are conditional either in their presence or values, depending on the State complex attribute and/or the value of a co-attribute.

Where the sub-attribute of a complex attribute is conditional, this is indicated in the Remarks section for the relevant feature class entries.

### Missing attribute values

It is an error for the value of mandatory attribute to be populated with an empty (null) value.

Where the value of a non-mandatory attribute is not known, the attribute must not be used.

### Multiplicity

In order to control the number of allowed attribute values or sub-attribute instances within a complex attribute, S-100 uses the concept of multiplicity. This defines lower and upper limits for the number of values, whether the order of the instances is significant and if an attribute is mandatory. Common examples are shown in Table 2‑4:

Format: MinOccurs, MaxOccurs (a \* indicates that infinite instances are possible, the term(ordered) indicates that the order of the provided instances is significant)

|  |  |
| --- | --- |
| **Multiplicity** | **Explanation** |
| 0,1 or 0..1 | An instance is not required; if provided there must only be one instance. |
| 1,1 or 1..1 | An instance is required and there must only be one instance. |
| 0,\*  or 0..1 | An instance is not required and there can be an infinite number of instances. |
| 1,\* or 1..\* | An instance is required and there can be an infinite number of instances. |
| 1,\* (ordered) | An instance is required and there can be an infinite number of instances, the order of which is significant. |
| 2,2 or 2..2 | Two instances are required and there must be no more than two. |

Table 2‑4 Multiplicity of attributes

### Other S-100 attributes

S-100 attribute types not mentioned are not used in this specification. Specifically, portrayal and scale attributes scaleMinimum/scaleMaximum are not used.

### Textual information

The text populated in attributes of type **text** must not exceed 300 characters. Character strings contained in **text** sub-attributes must be UTF-8 character encoding.

### Dates and times

For attributes that use the complete date type (type *Date* or *DA*), all their components (year, month, day and timezone) must be specified.

The truncated date type (type *S100\_TruncatedDate* or *TD*), is not currently used in this specification.

Dates and times must be encoded according to the emerging time specification (UKHO\_IHMA\_2017).

## Associations

This specification does not use feature or information associations.

## Datasets

### Types of Datasets

A dataset is a single feature which comprises a single specific message. Such a dataset may be referred to as a “message” in this product specification.

Messages may also be transferred as collections consisting of zero or more messages. Individual messages in a collection must conform to the rules for a single message, but the structure of the collection wrapper containing the messages is out of the scope of this specification.

The following types of transfers may be produced:

|  |  |
| --- | --- |
| **Dataset** | **Explanations** |
| New dataset (or message) | A single PCM message. |
| Collection | A sequence of zero or more messages. |

Table 2‑5 PCM dataset types

### Metadata

Metadata exchange is not part of the PCM data transfer and therefore metadata elements are not defined for PCM.

### Identifiers

Each port call message must have a unique identifier structured as a Marine Resource Name (MRN). Several other types of identifiers are used in this specification. They are given in the table below. All identifiers are sub-types of the S-100 type “text” either directly or through its sub-type URN.

|  |  |
| --- | --- |
| **Identifier type** | **Definition** |
| LocalJobIdentifier | Port call identifier, based on MRN. |
| Informal Pattern | urn:mrn:ipcdmc:urn:mrn:ipcdmc:local\_job:… |
| Remarks | First element of the NSS should be the UN/Locode of the port |
| LocalPortCall‌Identifier | Local Port call identifier, based on MRN. |
| Informal Pattern | urn:mrn:ipcdmc:urn:mrn:ipcdmc:local\_port\_call:… |
| Remarks | First element of the NSS should be the UN/Locode of the port, second element is a data source id and the third is the port call id of the data source external system. |
| LocationIdentifier | Location identifier, based on MRN. |
| Informal Pattern | urn:mrn:ipcdmc:location:… |
| Remarks | This can be either a specific identifier for an identified physical location or a type-only identifier for a logical location, such as BERTH |
| MRN | Marine Resource Name identifier, based on URN. |
| Informal Pattern | urn:mrn:… |
| Remarks | Note that the NID, including the mrn: prefix can be no more than 31 characters long. |
| PortCallIdentifier | Port call identifier, based on MRN. |
| Informal Pattern | urn:mrn:ipcdmc:urn:mrn:ipcdmc:port\_call:… |
| Remarks | First element of the NSS should be the 5 character UN/Locode of the port |
| PortCallMessage‌Identifier | Port call message identifier, based on MRN and UUID. |
| Informal Pattern | urn:mrn:ipcdmc:urn:mrn:ipcdmc:message:… |
| Remarks |  |
| UUID | Universally unique identifier |
| Informal Pattern | urn:… |
| Remarks | IETF RFC 4122(?). Length=36 |
| VesselIdentifier | Vessel identifier, based on MRN. Can be either IMO or MMSI based |
| Informal Pattern | urn:mrn:ipcdmc:vessel:… |
| Remarks |  |

Table 2‑6. Identifier types

## Scale policy

PCM data is scale-independent and scale attributes are not used.

# Description of table format for feature and information types

**X.X Clause heading**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| IHO Definition: **FEATURE:** Definition. (Authority for definition). | | | | | | | | | | | | |
| **S-211[Geo Feature/Information Type]: Feature (S-57 Acronym)** S-211 feature and corresponding S-57 acronym (if applicable) | | | | | | | | | | | | |
| **Primitives:** Allowable geometric primitive(s) [**Point, Curve, Surface]** | | | | | | | | | | | | |
| *Real World*  Example if real world instance(s) of the Feature. | | | *Paper Chart Symbol*  Example(s) of paper chart equivalent symbology for the Feature (if applicable). | | | | | *ECDIS Symbol*  Example(s) of proposed ECDIS symbology for the Feature. | | | | |
| **Attribute** | | **S-57 Acronym** | | | | **Allowable Encoding Value** | | | | **Type** | **Multiplicity** | |
| Category of beer | |  | | | | 1 : ale  2 : lager  3 : porter  4 : stout  5 : pilsener  6 : bock beer  7 : wheat beer | | | | EN | 1,1 | |
| This section lists the allowable attributes for the S-101 feature. Attributes are listed in alphabetical order. Sub-attributes (Type prefix (S)) of complex (Type C) attributes are listed in alphabetical order and indented directly under the entry for the complex attribute (see below for example). | | This section lists the corresponding S-57 attribute acronym. A blank cell indicates no corresponding S-57 acronym. | | | | This section lists the allowable encoding values for S-101 (for enumerate (E) Type attributes only). Further information about the attribute is available in Section XX. | | | | Attribute type (see clause X.X). | Multiplicity describes the “cardinality” of the attribute in regard to the feature. If “(ordered)” is included, the order of the instances matters. See clause X.X. | |
| Fixed date range | |  | | | |  | | | | C | 0,1 | |
| Date end | | (DATEND) | | | |  | | | | (S) DA | 0,1 | |
| Date start | | (DATSTA) | | | |  | | | | (S) DA | 0,1 | |
| **Feature/information associations** | | | | | | | | | | | | |
| **Type** | **Association Name** | **Class** | | **Role** | **Mult.** | | **Class** | | **Role** | | | **Mult.** |
| Aggr  Asso  Comp | Name of the Association | **Feature or Information Type at “this” end** | | At “this” end | At “this” end  x..y | | **Feature or Information Type(s) at “other” end** | | Role name | | | At “other” end  x..y |
| INT 1 Reference:The INT 1 location(s) of the Feature – by INT1 Section and Section Number (if applicable).  **X.X.X Sub-clause heading(s) (see S-4 – B-YYY.Y)**  Introductory remarks. Includes information regarding the real world entity/situation requiring the encoding of the Feature in the ENC, and where required nautical cartographic principles relevant to the Feature to aid the compiler in determining encoding requirements.  Specific instructions to encode the feature.  Remarks:   * Additional encoding guidance relevant to the feature.   **X.X.X.X Sub-sub-clause heading(s) (see S-4 – B-CCC.C)**  Clauses related to specific encoding scenarios for the Feature (if required).  Remarks:   * Additional encoding guidance relevant to the scenario (if required).   Distinction: List of features in the Product Specification distinct from the Feature. | | | | | | | | | | | | |

Remarks:

Attribute: Indentation of attributes indicates sub-attributes of complex attributes. Complex attributes may also be sub-attributes of complex attributes, which is indicated by further indentation of the attribute name in the tables.

S-57 Acronym: S-57 attribute acronyms shown in italic style text have been re-modelled from S-57.

Allowable Encoding Value: For (EN) type attributes, the enumerates listed are only those allowable for the particular occurrence of the attribute relevant to the feature. Allowable values may vary for the attribute depending on the feature to which the attribute is bound. Such bindings are defined in the S-211 Feature Catalogue. The full list of enumerates that may be assigned to an attribute in S-211 can be found in the Simple Attributes section of the printed feature catalogue document.

Type: The prefix (C) indicates that the attribute is a complex attribute. Complex attributes are aggregates of other attributes that can be simple type or complex type (see Product Specification main document). The prefix (S) indicates that the attribute is a sub-attribute of a complex attribute. Complex attributes that are sub-attributes of a complex attribute, and their sub-attributes, are indicated by indentation of the attribute name in the S-211 Attribute column.

Association ends and multiplicities: A lower bound of 0 in the multiplicity at any end of an association indicates only that the association is not mandatory for any particular instance of the feature at the other end (i.e., it is not mandatory for an instance of “that” feature type to have an association to a feature of “this” type). A lower bound of “1” means that if an instance of “that” type exists, it must be associated to a instance of “this” type. If the association is actually encoded then it amounts to saying that “this relationship exists between these two instances” and there must be an appropriate feature instance at both ends. Associations that are not mandatory should be encoded if and only if they convey useful information.

# Metadata Features

Metadata features such as the S-101 (ENC) Data Coverage and Quality of Bathymetric Data features are not used in this specification.

# Geo Features

## Introduction

There are no geographic feature types in the PCM specification.

## Port Call Message

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IHO Definition: **Port Call Message:** Definition required | | | | | | |
| **S-211 Geo Feature: PortCallMessage**  **Supertype: none** | | | | | | |
|  | | | | | | |
| *Real World*  not applicable | *Paper Chart Symbol*  **None** | | | *ECDIS Symbol*  **none** | | |
| **Attribute** | |  | **Allowable Encoding Value** | | **Type** | **Multiplicity** |
| port call ID | |  |  | | URN subtype PortCallIdentifier | 0,1 |
| local port call ID | |  |  | | URN subtype LocalPortCallIdentifier | 0,1 |
| local job ID | |  |  | | URN subtype LocalJobIdentifier | 0,1 |
| vessel ID | |  |  | | URN subtype VesselIdentifier | 0,1 |
| message ID | |  |  | | URN subtype PortCallMessageIdentifier | 1,1 |
| reported at | |  |  | | DT | 0,1 |
| reported by | |  |  | | TE | 0,1 |
| comment | |  |  | | TE | 0,1 |
| location state | |  |  | | C | 0,1 |
| reference object | |  | 1: AGENT  2: BUNKER\_VESSEL  3: ESCORT\_TUG  4: FRESH\_WATER\_VESSEL  5: GANGWAY  6: ICEBREAKER  7: MOORER  8: PASSENGER  9: PILOT  10: PILOT\_BOAT  11: PONTOONS\_AND\_FENDERS  12: SECURITY  13: SLOP\_VESSEL  14: SLUDGE\_VESSEL  15: SURVEYOR  16: TUG  17: VESSEL | | EN | 1,1 |
| effective time | |  |  | | DT | 1,1 |
| window before | |  | HH:MM | | TE | 0,1 |
| window after | |  | HH:MM | | TE | 0,1 |
| time type | |  | 1: ESTIMATED  2: ACTUAL  3: PLANNED  4: RECOMMENDED  5: REQUIRED | | EN | 1,1 |
| time sequence | |  | 8: ARRIVAL\_TO  9: DEPARTURE\_FROM | | EN | 1,1 |
| fromLocation | |  |  | | C (type location, Table 5‑1) | 0,1 |
| toLocation | |  |  | | C (type location, Table 5‑1) | 0,1 |
| service state | |  |  | | C | 0,1 |
| Performing Actor | |  |  | | URN (subtype MRN) | 0,1 |
| Service Object | |  | 1: ANCHORING  2: ARRIVAL\_ANCHORING\_OPERATION  3: ARRIVAL\_BERTH  4: ARRIVAL\_PORTAREA  5: ARRIVAL\_VTSAREA  6: BERTH\_SHIFTING  7: BERTH\_VISIT  8: BUNKERING\_OPERATION  9: CARGO\_OPERATION  10: CARGO\_SURVEY  11: DEPARTURE\_ANCHORING\_OPERATION  12: DEPARTURE\_BERTH  13: DEPARTURE\_PORTAREA  14: DEPARTURE\_VTSAREA  15: EMBARKING  16: ESCORT\_TOWAGE  17: FORKLIFT  18: GANGWAY\_OPERATION  19: GARBAGE\_OPERATION  20: ICEBREAKING\_OPERATION  21: INSPECTION  22: LOADING\_OPERATION  23: LUBEOIL\_OPERATION  24: MOORING\_OPERATION  25: PILOT\_BOAT\_OPERATION  26: PILOTAGE  27: PONTOONS\_AND\_FENDERS\_OPERATION  28: PORT\_VISIT  29: POSTCARGOSURVEY  30: PRECARGOSURVEY  31: PROVISION\_OPERATION  32: READYTOSAIL\_OPERATION  33: SECURITY\_OPERATION  34: SLOP\_OPERATION  35: SLUDGE\_OPERATION  36: TOURS  37: TOWAGE  38: UNLOADING\_OPERATION  39: UNMOORING\_OPERATION  40: WATER\_OPERATION  41: CRANE\_OPERATION  42: RAMP\_OPERATION | | EN | 1,1 |
| effective time | |  |  | | DT | 1,1 |
| time sequence | |  | 6: COMMENCED  7: COMPLETED | | EN | 1,1 |
| time type | |  | 1: ESTIMATED  2: ACTUAL  3: TARGET  4: RECOMMENDED  5: REQUESTED | | EN | 1,1 |
| window after | |  | HH:MM | | TE | 0,1 |
| window before | |  | HH:MM | | TE | 0,1 |
| at location | |  |  | | C (type location, Table 5‑1) | 0,1 |
| between locations | |  |  | | C | 0,1 |
| from location | |  |  | | C (type location, Table 5‑1) | 1,1 |
| to location | |  |  | | C (type location, Table 5‑1) | 1,1 |
| administration state | |  |  | | C | 0,1 |
| Performing Actor | |  |  | | URN (subtype MRN) | 0,1 |
| Service Object | |  | 1: ANCHORING  2: ARRIVAL\_ANCHORING\_OPERATION  3: ARRIVAL\_BERTH  4: ARRIVAL\_PORTAREA  5: ARRIVAL\_VTSAREA  6: BERTH\_SHIFTING  7: BERTH\_VISIT  8: BUNKERING\_OPERATION  9: CARGO\_OPERATION  10: CARGO\_SURVEY  11: DEPARTURE\_ANCHORING\_OPERATION  12: DEPARTURE\_BERTH  13: DEPARTURE\_PORTAREA  14: DEPARTURE\_VTSAREA  15: EMBARKING  16: ESCORT\_TOWAGE  17: FORKLIFT  18: GANGWAY\_OPERATION  19: GARBAGE\_OPERATION  20: ICEBREAKING\_OPERATION  21: INSPECTION  22: LOADING\_OPERATION  23: LUBEOIL\_OPERATION  24: MOORING\_OPERATION  25: PILOT\_BOAT\_OPERATION  26: PILOTAGE  27: PONTOONS\_AND\_FENDERS\_OPERATION  28: PORT\_VISIT  29: POSTCARGOSURVEY  30: PRECARGOSURVEY  31: PROVISION\_OPERATION  32: READYTOSAIL\_OPERATION  33: SECURITY\_OPERATION  34: SLOP\_OPERATION  35: SLUDGE\_OPERATION  36: TOURS  37: TOWAGE  38: UNLOADING\_OPERATION  39: UNMOORING\_OPERATION  40: WATER\_OPERATION  41: CRANE\_OPERATION  42: RAMP\_OPERATION | | EN | 1,1 |
| effective time | |  |  | | DT | 1,1 |
| time sequence | |  | 1: ESTIMATED  2: ACTUAL  3: TARGET  4: RECOMMENDED  5: CANCELLED | | EN | 1,1 |
| window after | |  | HH:MM | | TE | 0,1 |
| window before | |  | HH:MM | | TE | 0,1 |
| atLocation | |  |  | | C (type location, Table 5‑1) | 0,1 |
| between locations | |  |  | | C | 0,1 |
| from location | |  |  | | C (type location, Table 5‑1) | 1,1 |
| to location | |  |  | | C (type location, Table 5‑1) | 1,1 |
| message operation | |  |  | | C | 0,1 |
| message ID | |  |  | | URN (subtype PortCallMessageIdentifier) | 1,1 |
| messageOperationCommand | |  | 1: WITHDRAW | | EN | 1,1 |
| Location state, administration state, service state, and message operation Exactly one of these attributes must be populated. Locations in complex attribute locationState At least one of the attributes fromLocation and toLocation must be populated.  If the value of the timeSequence attribute is ARRIVAL\_TO, toLocation must be populated.  If the value of the timeSequence attribute is DEPARTURE\_FROM, fromLocation must be populated. Locations in complex attribute administrationState Exactly one of the attributes atLocation and betweenLocations must be populated. Locations in complex attribute serviceState Exactly one of the attributes atLocation and betweenLocations must be populated. Time windows It is also possible to communicate a time span, a window relative to the “effectiveTime” field. This is achieved with the “windowBefore” and windowAfter” fields, that each take an offset, in hours and minutes, format (“HH:MM”). Only positive values are allowed for both fields.  Remarks:  To a particular state there are different communicative functions that are associated. The time of when a particular state should be reached could be recommended to someone(s) for its occurrence (as e.g. a recommendation of when the vessel should initiate the port visit). The time of when a particular state could be targeted of when it is aimed to occur as well as estimated of when it is expected to be occur. When a state has occurred its status becomes actual.  These different time types, i.e. recommended, targeted, estimated, and actual are different possible time types that could enable enhanced coordination among involved actors. Associated states to an event represents the progress of the event, is initiated by the progress of other states (within the same or in other events), and could trigger other states (within the same or in other events).  A state could concern the certain time a physical object has arrived at, or departed from a particular geographical spot (location state), such as the vessel is at berth (all fast), and the certain time a particular service is to be commenced or completed (service state), such as cargo operations are commenced. Commencing and completing a service is normally preceded by sequences of communicative acts such as requested, request received, denied, confirmed, and cancelled regulated in the time sequence of the state. A time stamp of an administrative state is not combined with a time type since all administrative states are actuals.  A unique combination of time type and state type constitute the time stamp, as e.g. Estimated Time of Arrival Vessel at Pilot Boarding Area which is the specification of what is often referred to as ETA. This suggested level of granularity specifies what it concerns and to which location, decreasing the probability for misunderstanding.  Distinction: None | | | | | | |

All locations are encoded as a complex attribute with the sub-attributes in the table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Complex Type: **location:** Location identifier, based on MRN. | | | | |
| **Attribute Type** | **S-57 Acronym** | **Allowable Encoding Value** | **Type** | **Multiplicity** |
| Location |  |  | C |  |
| location MRN |  |  | URN subtype MRN | 1,1 |
| Location MRN Location MRN can be either a specific identifier for an identified physical location or a type-only identifier for a logical location, such as BERTH.  The URN must be of the form urn:mrn:ipcdmc:location:<LOCID>:<TYPEID>:… where:   * <LOCID> is a 5-character port UN/LOCODE * <TYPEID> is one of the type identifiers defined in the main PortCDM product specification (section 7.2.2). * Anything following the <TYPE\_ID> is the specific location id   Letter case may be upper or lower case.  The full pattern is given in the XML schemas which specify the data format.  Coordinates are encoded with west longitudes and south latitudes negative. | | | | |

Table 5‑1. Complex type location

# Information Types

Information types are not used in this specification.

# Geo Feature Attribute and Enumerate Descriptions

[See the Simple attributes and Complex attributes sections in Appendix C – Feature Catalogue.]

# Associations

Associations and roles are not used in this product specification.

# Meta Feature and Spatial Attribute and Enumerate Descriptions

Meta features are not used in this product specification, nor are spatial attributes.

# Complex Attributes

[See the Complex attributes section in Appendix C – Feature Catalogue.]

# ECDIS System (Portrayal) Attributes

Portrayal attributes are not used in this edition of S-211 Port Call Message Product Specification.

# Updating

The S-211 Port Call Message specification does not define a distinct format for updating messages.