BS ISO 28005-2:2011

BSI Standards Publication

Security management systems for the supply chain — Electronic port clearance (EPC)

Part 2: Core data elements

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee SME/32, Ships and marine technology - Steering committee.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 66170 9

ICS 35.240.60; 47.020.99

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2011.

Amendments issued since publication

Date	Text affected

BS ISO 28005-2:2011

INTERNATIONAL STANDARD

ISO 28005-2

First edition
2011-03-01

Security management systems for the supply chain — Electronic port clearance (EPC) —

Part 2: Core data elements

Systèmes de management de la sécurité pour la chaîne d'approvisionnement — Opérations portuaires assistées par systèmes électroniques —

Partie 2: Éléments de données principaux

Reference number
ISO 28005-2:2011(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 28005-2 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*.

This first edition of ISO 28005-2 cancels and replaces ISO/PAS 28005-2:2009 which has been technically revised.

ISO 28005 consists of the following parts, under the general title *Security management systems for the supply chain — Electronic port clearance (EPC)*:

— *Part 2: Core data elements*

The following part is under preparation:

— *Part 1: Message structures*

INTERNATIONAL STANDARD **ISO 28005-2:2011(E)**

Security management systems for the supply chain — Electronic port clearance (EPC) —

Part 2: Core data elements

1 Scope

1.1 General

This part of ISO 28005 contains technical specifications that facilitate efficient exchange of electronic information between ships and shore for coastal transit or port calls. It is intended to cover safety and security information requirements related mainly to the relationships between the ship and the port and coastal state authorities as defined in this subclause.

This part of ISO 28005 contains the definition of core data elements for use in electronic port clearance (EPC) messages. It contains definitions of core data elements for electronic messaging between ships and shore in the areas of safety, security and marine operations. It does not define any structuring of messages or provide any guidance on what information is required for a particular purpose; it is rather a general data dictionary for safety, security or operation-related maritime information.

It is intended for use in XML messages and will for that reason differ somewhat from the similar trade data elements directory (TDED) International Standard, ISO 7372.

The core data elements defined in this part of ISO 28005 are specified so that their meaning and interpretation in general are independent of the context in which they are used.

This part of ISO 28005 does not define the message formats required to exchange information.

1.2 Application of the core data elements

This part of ISO 28005 contains definitions of core data elements for electronic port clearance (EPC). These elements cover all requirements for ship-to-shore and shore-to-ship reporting as defined in the following.

a) All FAL standard declarations (FAL 1 to 7) as defined in the FAL Convention.

b) ISPS reporting requirements as defined in ISPS and MSC 1305.

c) All general ship reporting requirements as defined in IMO Resolution A.851.

d) Recommended reporting on ship-generated waste as defined in MEPC 644 (mandatory within the European Union, as described in EU/2000/59).

e) Required reporting as defined in the bulk loading and unloading code IMO Resolution A.862.

f) ETA reporting to pilot station as defined in IMO Resolution A.960.

Annex L gives a cross-reference between the above references and the core data elements.

This part of ISO 28005 can also be used for information exchanges between the ship and the ship agent, the port and ship operator or manager. It will not necessarily cover issues such as customs clearance of imported or exported goods or transport service provisions to goods owners.

1.3 Types of data elements defined by this part of ISO 28005

Figure 1 shows some of the types of elements that are defined and referenced in this part of ISO 28005. The grey boxes represent objects that are not defined in this part of ISO 28005, but which are respectively basis information and results of using this part of ISO 28005.

The top-most grey box represents standard data types as defined in XML Schema Part 2 (XSD-2). The bottom-most grey box represents an electronic XML message containing data elements defined by using this part of ISO 28005.

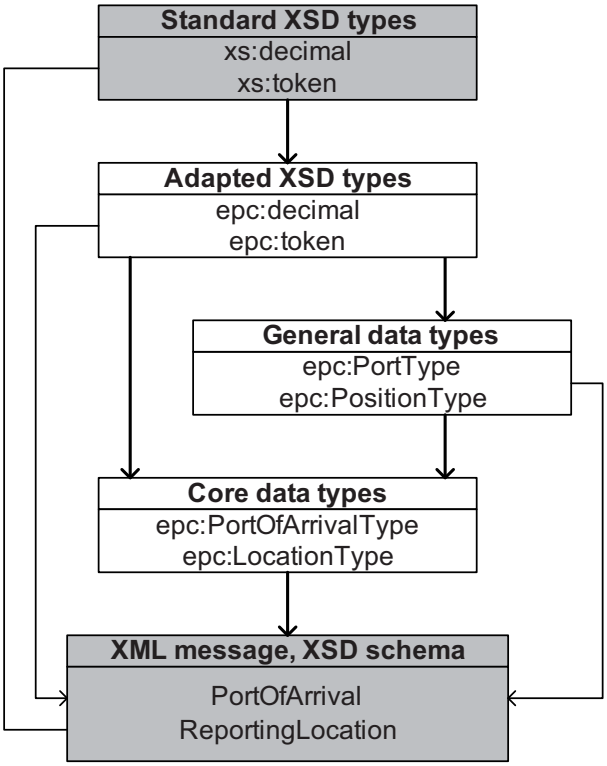

Figure 1 — Elements of this part of ISO 28005

Figure 1 does not include all elements in each group, but has selected a few from each group as examples. From the top downwards, the defined elements are as follows.

— Adapted XSD types: These are basic XSD types with additional restrictions that apply for the use of these elements in this part of ISO 28005.

— General data types: These are data types that represent common concepts like a port description or a certificate which normally need to be specialized more to be given a context-specific meaning.

— Core data types: These are data types that also contain a contextual meaning to the more generic concept, such as an arrival port instead of a general port or a reporting location instead of a general location.

This part of ISO 28005 does not prohibit the use of data types other than the EPC Core Elements when messages are defined (this is indicated with the thin arrows in Figure 1). However, such data elements will be given a specific semantic meaning in the specification of the message format.

1.4 Structure of the data element descriptions

Figure 2 gives an outline of the structure of this part of ISO 28005. The two rectangles at the top represent the general data types outlined in the previous clause while the row of rectangles at the bottom represents the EPC core elements.

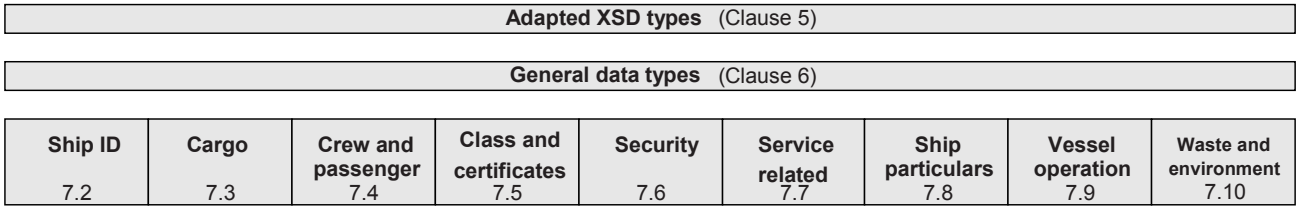

Figure 2 — Overview of the structure of this part of ISO 28005

The groups are loosely based on the order in which they appear on typical FAL forms:

a) Ship ID: ship identification and contact details.

b) Cargo: data related to cargo and cargo types.

c) Crew and passenger: crew- and passenger-related data.

d) Class and certificates: data related to class and certificates kept on board.

e) Security: mainly ISPS-related data.

f) Service-related: data related to services requested by the ship, including message headers and clearance request and status.

g) Ship particulars: static data about the ship.

h) Vessel operation: data that is dependent on current operation or voyage; also physical data that changes, e.g. with loading such as draught.

i) Waste and environment: currently, this section contains information about waste.

The grouping of core elements is for convenience only and need not result in any particular structuring of EPC messages. Additionally, the data elements, when defined in an XSD file, will not use any formal grouping; all data elements will have the same name space.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 6346, *Freight containers — Coding, identification and marking*

ISO 9711-1, *Freight containers — Information related to containers on board vessels — Part 1: Bay plan system*

ISO/IEC 10646:2003, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

IETF RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax*

International Maritime Dangerous Goods (IMDG) Gde, IMO

MEPC.1/Circ.644, *Standard Format for the Advance Notification Form for Waste Delivery of Port Reception Facilities*

UNECE R21 (UNECE Recommendation No. 21), *Codes for Passengers, Types of Cargo, Packages and Packaging Materials (with Complementary Codes for Package Names)*

UNTDD, *United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
character
atomic unit of text as specified by ISO/IEC 10646:2003

NOTE Legal characters include: tab, carriage return, line feed, and the legal characters of The Unicode Standard and ISO/IEC 10646. The editions cited in this part of ISO 28005 were current at the time of publication; new characters could be added to The Unicode Standard or ISO/IEC 10646 by amendments or future editions.

3.1.2
core data element
data object of a type defined in Clause 7 of this part of ISO 28005:2010.

NOTE The core data element will be represented as the contents between XML start and end tags, where the tags have the same name as the core data type with the trailing string “Type” omitted.

3.1.3
core data type
data type defined in Clause 7 of this part of ISO 28005:2010.

NOTE All core data types will have a trailing “Type” in their name which will be removed when the data type is instantiated as a core data element.

3.1.4
data type
core data type (3.1.3) or another data type defined in Clauses 5 or 6 of this part of ISO 28005:2010.

NOTE All data types will have a name ending with “Type”.

3.1.5
electronic port clearance
EPC
process of exchanging information between the ship and its agent and various parties on shore to allow the ship clearance to enter port and berth

NOTE EPC does not necessarily include customs clearance of goods that are imported or exported.

3.1.6
leg
part of a voyage between a departure port and an arrival port without any intervening port calls

3.1.7
OBO
oil-bulk-ore carrier
O/O carrier
ship whose design is similar to a conventional bulk carrier but that is equipped with pipelines, pumps and an inert gas plant so as to enable the carriage of oil cargoes in designated spaces

3.1.8
voyage
sailing of the ship from an initial departure port to a final arrival port with or without a number of intervening port calls

NOTE 1 What constitutes a voyage is defined by the ship's operator or its owner.

NOTE 2 See also **leg** (3.1.6).

3.1.9
XML schema
definition of the structure of an XML document, written in the XML schema language (XSD)

NOTE The XML schema language is in itself a valid XML structure.

3.2 Abbreviated terms

BLU bulk loading and unloading[1)]

DG dangerous goods[2)]

HS World Customs Organization's Harmonized System

FAL Facilitation, IMO's Facilitation Committee and standard forms defined in the FAL Convention

IRI Internationalized Resource Identifier[19]

ISM international safety management[3)]

ISPS international ship and port facility security[4)]

RORO Roll-on/Roll-off (ship)

TDED Trade Data Elements Dictionary[2]

1) The BLU code is described in the annex to IMO Resolution A.862.

2) The term “harmful and noxious substances” is also sometimes used instead of “dangerous goods”.

3) The ISM code is defined in Chapter IX of Reference [6].

4) The ISPS code is defined in Chapter XI-2 of Reference [6].

URI	Uniform Resource Identifier
URL	Uniform Resource Locator
XML	Extensible Markup Language
XSD	XML Schema Definition Language

4 General provisions

4.1 Use of XML name space

4.1.1 XSD name space

All data elements defined in the Schema standards[16][17], and which are used in this part of ISO 28005, use the name space “xs”. Thus, the data type name will be prefixed with “xs:”. This corresponds to the XSD definition file header including the following attribute:

```
<xs:schema ...
           xmlns:xs="http://www.w3.org/2001/XMLSchema" ...
```

4.1.2 ISO 28005-1 name space

All data types defined in this part of ISO 28005 will be defined in the namespace “epc”. Thus, the data type name will be prefixed with “epc:”. This corresponds to the XSD file header including the following attribute:

```
<xs:schema ...
           xmlns:epc="http://www.iso.org/28005-1" ...
```

4.2 Principle for creating tag names in a message file

This part of ISO 28005 defines data types that can be used to construct an XML message for exchange of information between ship and shore. Each information element in the XML file shall have a tag name derived from the corresponding core data type defined in this part of ISO 28005. The following rules apply.

a) If the information element in the XML file corresponds directly to a core data type defined in this part of ISO 28005, the tag name of that information element shall be the same as that for the type name without the trailing “Type” or “ContentType” that the core data type has.

b) If a new information element is created, it should get a name and type which reflects the principles employed in this part of ISO 28005.

4.3 Structure of data type definitions

4.3.1 Name

All data types defined in this part of ISO 28005 will be given a name that is also included as the first part of the heading for the clause where the data type is defined.

The data type name follows the specifications for XML tag names[15], with the following additional constraints.

a) The name will always end with the string “Type”.

b) Enumerated data types will have the postfix “ContentType”.

NOTE 1 Some core data elements can also have the ending “Type”. In that case, the corresponding core data type will have the postfix “TypeType”.

c) This part of ISO 28005 will use the “Upper Camel Case” in all core data types, i.e. the first letter will be upper case and, when the tag name consists of a number of concatenated words, each of the words will start with an upper case letter.

d) The name consists only of characters from the sets (A-Z), (a-z) and, exceptionally, (0-9).

NOTE 2 The names have been selected to be generally understandable in the context of ship-to-shore communication for port clearance. The names are in normal British English without any special characters. Names are in singular form except where the data element contains a list of items, in which case the tag name is in plural form.

4.3.2 Definition

Each data type will have a definition that is intended to give an unambiguous description of what the data element shall contain and in what context it is valid. This is the first paragraph after the heading of the clause.

4.3.3 Type

Each data type will be defined as a section of XSD code. This section will only cover the actual data type definition and will not be a valid XML document in itself. Annex M gives a brief overview of the syntax elements used, but the user of this part of ISO 28005 should refer to Reference [16] for the definitive descriptions.

4.3.4 Representation

Additional information about how the data field shall be formatted will be contained in the representation paragraph. This may give, for example, the normative reference to the official sources of enumeration codes.

4.4 Principles for defining enumerated types

Enumerated types, i.e. types that are associated with a fixed set of code values, are defined in one of three ways.

a) When the code set is small and not defined and maintained by parties external to this part of ISO 28005, the allowed code values are listed in the definition of the data type as XSD constraints.

b) If the code set is larger, but not defined by external parties, the code set is included in a normative annex. Subclause 8.2 defines how such code sets can be put into a separate XML file.

c) When the code set is maintained by an external party, the definition will only define the data type as a token and make a reference to where the code set can be found and how the code set shall be used in the core data element. An informative annex will normally contain a list of some of the most common codes. Subclause 8.2 can be used to encode the values in XML.

NOTE It will not be possible to use an XSD schema to validate the use of codes defined according to items b) and c) above.

4.5 Character sets for data fields

This part of ISO 28005 allows all character sets that are supported by XML (see 8.1). Additional restrictions may be specified in the representation part of the data type definitions.

4.6 No use of XML attributes

The data types defined by this part of ISO 28005 do not use XML attributes. All information is contained within XML start and stop tags.

4.7 Empty tags

Mandatory tags, i.e. tags that are not marked with minOccurs="0", shall normally contain valid data. Tags that are optional may be left out of the message, may be empty, i.e. have no end tag, or may have empty content. The receiver of messages shall treat all forms of empty tags the same.

4.8 Defaults for minOccurs and maxOccurs

According to Reference [16], the default values for minOccurs and maxOccurs equal 1. This is used in this part of ISO 28005 to shorten the type specifications in the data type definition clauses.

5 Adapted XSD data types

5.1 Introduction

The adapted XSD data types used in this part of ISO 28005 are defined in Reference [17]. Subclauses 5.2 to 5.10 contain additional restrictions on the use of these data types that apply in this part of ISO 28005.

5.2 epc:anyURI – Generalized URI

Definition:
This data type contains a valid generalized URI. This may be a mail address, prefixed by "mailto:", or an external file, prefixed by "file:".

Type:

```
<xs:simpleType name="anyURI">
   <xs:restriction base="xs:anyURI"/>
</xs:simpleType>
```

Representation:
All generalized URIs (which may be encoded as an IRI) allowed by Reference [17] are also allowed in this part of ISO 28005. However, to ensure compatibility with older systems, users are advised to use the URL type strings (seven-bit character set) until the IRI concept is sufficiently well implemented.

5.3 epc:boolean – Boolean flag

Definition:
This data type contains a date flag that can have the logical values true or false.

Type:

```
<xs:simpleType name="boolean">
   <xs:restriction base="xs:boolean"/>
</xs:simpleType>
```

Representation:
All flag values allowed in the XSD definition given in Reference [17] are allowed. When the boolean type is used in contexts where the value represents an answer to a yes/no question, the true value shall represent "yes" while the false value represents "no".

5.4 epc:date – General date

Definition:
This data type contains a date without additional time of day or time zone information.

Type:

```
<xs:simpleType name="date">
```

```
  <xs:restriction base="xs:date"/>
</xs:simpleType>
```

Representation:
This is a date in the standard XSD format, without any time zone code in the value.

Senders of date information should not include time zone information. Receivers should be prepared to accept a time zone code, but it shall be disregarded in further processing of the data.

5.5 epc:dateTime – Time and date, with time zone

Definition:
This data type contains a date with additional time of day and time zone information.

Type:

```
<xs:simpleType name="dateTime">
  <xs:restriction base="xs:dateTime"/>
</xs:simpleType>
```

Representation:
This is a date and time in the standard XSD format, with a time zone code in the value.

Senders of date and time information shall include time zone information. Receivers should be prepared to accept values without time zone codes. In this case, the time zone is undefined and proper actions should be taken by the systems processing this data.

NOTE 1 The time zone value “Z” is a valid code and refers to GMT or UTC time.

NOTE 2 The seconds field can contain the value 60 (when leap seconds occur).

5.6 epc:decimal – Decimal number

Definition:
This data type is used to specify a quantity.

Type:

```
<xs:simpleType name="decimal">
   <xs:restriction base="xs:decimal"/>
</xs:simpleType>
```

Representation:
The decimal type represents a subset of the real numbers, which can be represented by decimal numerals. The value space of decimal is the set of numbers that can be obtained by multiplying an integer by a non-positive power of ten, i.e. expressible as $i \times 10^{-n}$ where i and n are integers and $n \geqslant 0$. Precision is not reflected in this value space; the number 2.0 is not distinct from the number 2.00. The order relation on decimal is the order relation on real numbers, restricted to this subset.

The decimal has a lexical representation consisting of a finite-length sequence of decimal digits (#×30–#×39) separated by a period as a decimal indicator. An optional leading sign is allowed. If the sign is omitted, “+” is assumed. Leading and trailing zeros are optional. If the fractional part is zero, the period and following zeros can be omitted. For example: −1.23, 12678967.543233, +100000.00, 210. See Reference [17].

NOTE The format requires the use of the period (.) as decimal sign. Some national standards use, e.g., a comma (,) for this purpose. In such cases, the sending or receiving application performs the translation.

5.7 epc:duration – Time duration

Definition:
This data type is used to specify duration in time.

Type:
```
<xs:simpleType name="duration">
  <xs:restriction base="xs:duration"/>
</xs:simpleType>
```

Representation:
This type can specify a time period as specified in Reference [17]. The general format is "[–]P*n*Y*n*M*n*DT*n*H*n*M*n*[.*n*]S", where [–] is an optional minus sign, *n* is a positive integer number and [.*n*] is an optional decimal field.

5.8 epc:int – Integer number

Definition:
This data type is used to specify an integer quantity.

Type:
```
<xs:simpleType name="int">
  <xs:restriction base="xs:int"/>
</xs:simpleType>
```

Representation:
The integer type is an integer in the range from –2147483648 to 2147483647 (inclusive).

5.9 epc:string – General string

Definition:
This data type contains a general string that is mainly intended to be read by humans. There are no restrictions on the format of the string. See 5.10 for a string type that is intended for computer consumption.

Type:
```
<xs:simpleType name="string">
  <xs:restriction base="xs:string"/>
</xs:simpleType>
```

Representation:
No restrictions on the string representation beyond what is specified in Reference [17] are enforced on the type level. The representation field in the data type definition may put length constraints on the string.

The receiver should be prepared to accept longer strings than specified, but such strings may be truncated. Thus, the sender cannot rely on longer strings being processed or displayed.

5.10 epc:token – Computer-understandable string

Definition:
The token data type is used for a text string that is mainly meant to be interpreted by a computer. This includes enumerated codes as well as other structured strings.

Type:
```
<xs:simpleType name="token">
  <xs:restriction base="xs:token"/>
</xs:simpleType>
```

Representation:
The representation field in the type definition clause will specify how restrictions apply.

6 General data types

6.1 Introduction

The data types defined in this section are not specific to any particular function. Some of them are based on UN/CEFACT CCL version 08A[12]. The definition contained in the text is in these cases simplified compared to the full definition of the original types. However, they should be semantically compatible with the data model description of CCL.

6.2 epc:AttachmentType – Reference to an attached document

Definition:
This type contains a description of and a reference to an attached document.

Type:

```
<xs:complexType name="AttachmentType">
  <xs:sequence>
    <xs:element name="URI" type="epc:string" minOccurs="0"/>
    <xs:element name="Description" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This data element shall contain a valid URI as specified in IETF RFC 3986 that points to an attached file. The URI should normally use the “file:./xxx.yyy” format to point to a local file with the name “xxx.yyy” (as an example). In this case, the receiver shall find the attached file either as a parallel attachment in an electronic mail message or as a component of an archive file on the same level as the XML message. The Description can give a human-readable description of the attached file or it can contain the attached information itself. If a URI is supplied, the Description is for information only and may not be read by the receiver. If the URI is empty or does not exist, the Description contains the attached information.

6.3 epc:ContactInfoType – Contact information

Description:
This data type contains contact information for either a person or a company.

Type:

```
<xs:complexType name="ContactInfoType">
  <xs:sequence>
    <xs:element name="Address" type="epc:PostalAddressType" />
    <xs:element name="ContactNumbers" type="epc:CommunicationNumberType" />
    <xs:element name="Person" type="epc:NameType" minOccurs="0" />
    <xs:element name="Company" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
Common information for both persons and companies are address and contact numbers. Companies and persons differ in that companies have one name in a string, while persons can have a given name, family name, and middle name. Exactly one of Person and Company shall be included in the data item.

6.4 epc:CommunicationNumberType – Communication number information

Definition:
This data type specifies a contact point via telephone or other means.

Type:

```
<xs:complexType name="CommunicationNumberType">
  <xs:sequence>
    <xs:element name="BusinessTelephone" type="epc:string" minOccurs="0"/>
    <xs:element name="MobileTelephone" type="epc:string" minOccurs="0"/>
    <xs:element name="HomeTelephone" type="epc:string" minOccurs="0"/>
    <xs:element name="Telefax" type="epc:string" minOccurs="0"/>
    <xs:element name="EMail" type="epc:anyURI" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This element contains a list of contact points for a person or organization. Telephone numbers shall be specified with an international prefix code. The e-mail tag shall be a valid URI with the “mailto:” prefix.

6.5 epc:CountryCodeContentType – Country identification

Definition:
This data type gives a unique and coded representation of a country identity.

Type:

```
<xs:simpleType name="CountryCodeContentType">
  <xs:restriction base="epc:token">
    <xs:length value="2"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The content of this element shall be the two-letter country code as defined in ISO 3166-1.

6.6 epc:GenderContentType – Enumeration type for Male/Female

Definition:
This enumeration type contains the values Male and Female.

Type:

```
<xs:simpleType name="GenderContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="Male"/>
    <xs:enumeration value="Female"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The two codes specified are the only valid ones.

6.7 epc:MeasureType – A physical measurement

Definition:
This data type contains one measurement of a physical quantity.

Type:

```
<xs:simpleType name="MeasurementUnitContentType">
  <xs:restriction base="xs:token"/>
</xs:simpleType>


<xs:complexType name="MeasureType">
  <xs:sequence>
    <xs:element name="Content" type="epc:decimal"/>
    <xs:element name="UnitCode" type="epc:MeasurementUnitContentType"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The UnitCode is the unit code as defined in UNECE R20. Examples of some commonly used codes are given in Annex D. Content is the quantity related to the specified unit code.

6.8 epc:NameType – Name of person

Definition:
This data type contains the full name of a person.

Type:

```
<xs:complexType name="NameType">
  <xs:sequence>
    <xs:element name="GivenName" type="epc:string"/>
    <xs:element name="MiddleName" type="epc:string" minOccurs="0"/>
    <xs:element name="FamilyName" type="epc:string"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
Represented as three text strings, where the middle name is optional. Strings are in free text and may not be suitable for computer-based comparisons.

NOTE Users of this core data element might want to impose additional restrictions on the data type, e.g. by requiring the spelling to be as in an electronically readable identification paper.

6.9 epc:OrganisationType – Description of an organization

Definition:
This data type is used to give details of an organized body such as a business, government body, department or charity.

Type:

```
<xs:complexType name="OrganisationType">
  <xs:sequence>
    <xs:element name="Name" type="epc:string" minOccurs="0"/>
    <xs:element name="RegistrationCountryCode"
                type="epc:CountryCodeContentType" minOccurs="0"/>
    <xs:element name="RegistrationDate" type="epc:date" minOccurs="0"/>
    <xs:element name="TaxIdentifier" type="epc:string"
                minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
```

```
</xs:complexType>
```

Representation:
The details are official name of organization, country of registration, date of registration and tax identification code [e.g. value added tax (VAT) code[5)]]. The specification allows any or all fields to be omitted. Note also that an organization can have a number of different TaxIdentifier codes. All strings are intended to be read by humans and no restrictions are enforced on the elements.

6.10 epc:PortType – Identification of a port

Definition:
This data type identifies a specific port.

Type:

```
<xs:complexType name="PortType">
  <xs:sequence>
    <xs:element name="Name" type="epc:string"/>
    <xs:element name="Facility" type="epc:string"/>
    <xs:element name="ContryCode" type="epc:CountryCodeContentType"/>
    <xs:element name="UNLoCode" type="epc:UNLoCodeContentType"/>
    <xs:element name="GISISCode" type="epc:token" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The name field is the name of the port, written as the port name is normally written. Facility is the facility as defined in ISPS, terminal or berth. Both of these are to be read by humans. The location code is the UN location code and the country code specifies the country. The GISIS code field is a four-digit token corresponding to the port facility's code in the IMO GISIS maritime security database. All fields except the GISIS code are mandatory, but an unknown location code may be specified.

6.11 epc:PositionType – Geographical position

Description:
This data type is used for geographical positions, represented by latitude and longitude.

Type:

```
<xs:simpleType name="LatitudeType">
  <xs:restriction base="epc:decimal">
    <xs:minInclusive value="-90"/>
    <xs:maxInclusive value="90"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="LongitudeType">
  <xs:restriction base="epc:decimal">
    <xs:minInclusive value="-180"/>
    <xs:maxInclusive value="180"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="PositionType">
  <xs:sequence>
    <xs:element name="Latitude" type="epc:LatitudeType"/>
    <xs:element name="Longitude" type="epc:LongitudeType"/>
```

5) In some countries VAT is referred to as goods and services tax (GST).

```
  </xs:sequence>
</xs:complexType>
```

Representation:
The latitude and longitude are represented using the degrees and decimal degree format recommended by ISO 6709, i.e. {±}dd.dd for latitude and {±}ddd.dd for longitude, where '+' (plus) indicates north or east and '–' (minus) indicates south or west. The '+' (plus) sign can be omitted.

6.12 epc:PostalAddressType – A postal mail address

Definition:
This is the postal address for a person or organization. The description of country is simplified to contain only the two-letter ISO standard as described in CountryCodeContentType. This means that the CountryID is not needed as an element.

Type:

```
<xs:complexType name="PostalAddressType">
  <xs:sequence>
    <xs:element name="PostCodeCode" type="epc:token" minOccurs="0" />
    <xs:element name="PostOfficeBox" type="epc:string" minOccurs="0" />
    <xs:element name="LineOne" type="epc:string" minOccurs="0" />
    <xs:element name="LineTwo" type="epc:string" minOccurs="0" />
    <xs:element name="LineThree" type="epc:string" minOccurs="0" />
    <xs:element name="LineFour" type="epc:string" minOccurs="0" />
    <xs:element name="LineFive" type="epc:string" minOccurs="0" />
    <xs:element name="StreetName" type="epc:string" minOccurs="0" />
    <xs:element name="StreetNumber" type="epc:string" minOccurs="0" />
    <xs:element name="CityName" type="epc:string" minOccurs="0" />
    <xs:element name="Country" type="epc:CountryCodeContentType"
                minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
This is the description of a postal address. Most fields are intended to be read by humans and are free format, except for the country code. The LineOne to LineFive tags can be used for various contact information and should in general be printable, one tag data on one line.

6.13 epc:RemarksType – General remarks

Definition:
This type is used for general remarks fields.

Type:

```
<xs:simpleType name="RemarksType">
  <xs:restriction base="epc:string"/>
</xs:simpleType>
```

Representation:
This is a human-readable general remark. The context of the remarks field will be given by the context in which it is placed.

6.14 epc:UNLoCodeContentType – UN location code

Definition:
A data element of this type specifies a UN location code.

Type:

```
<xs:simpleType name="UNLoCodeContentType">
```

```
    <xs:restriction base="epc:token">
      <xs:length value="3"/>
    </xs:restriction>
  </xs:simpleType>
```

Representation:
The enumeration contains the three-letter location code as defined in UNECE R16. The location code (lower case) “xxx” is reserved for an unknown location code.

This code should normally be used together with the country code (CountryCodeContentType). It has been decided to represent country and location codes in two separate tags to simplify formatting of human-readable text.

6.15 epc:VersionType – Version code

Definition:
This type contains a version code.

Type:

```
<xs:simpleType name="VersionType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
This string contains a version code in the format “M.N” or “M.N.P” where M, N, and P are positive integers, possibly with leading zeros. The sender and receiver of this version code can use the following rules to determine if the receiver is able to process the associated information.

a) If the “M” code is different from what the receiver can understand, the receiver shall not try to process the information; it may be incompatibility in coding or semantics.

b) If the “N” code sent is higher than what the receiver understands, the receiver can still safely process the information it understands, but there may be additional enumeration codes or tags in the message that shall be discarded.

c) If the “N” code sent is lower or the same as what the receiver understands, it can safely process the information.

d) The “P” code shall be ignored by the receiver. It can be used by manufacturers to internally identify different revisions of sending systems.

7 Core data types

7.1 Introduction

This section contains data types that can be instantiated as core data elements in EPC-related messages. This clause is divided into a number of subclauses where each subclause contains data types from a specific domain. This subdivision is for convenience only and does not imply any special organization of core data elements in a specific message.

7.2 Ship identity and contacts data types

7.2.1 epc: Agent Type – The ship's agent

Definition:
This type contains information about the organization representing the ship in a specific context. This may be the Company or an agent, depending on circumstances.

Type:

```
<xs:complexType name="AgentType">
   <xs:complexContent>
      <xs:extension base="epc:ContactInfoType"/>
   </xs:complexContent>
</xs:complexType>
```

Representation:
The element shall contain contact information for the Company as defined in the ContactInfoType element.

7.2.2 epc:CompanyType – The ship's operating Company

Definition:
This type contains information about the Company as defined in the ISM code.

Type:

```
<xs:complexType name="CompanyType">
  <xs:sequence>
    <xs:element name="Organisation" type="epc:OrganisationType" />
    <xs:element name="Contact" type="epc:ContactInfoType" />
    <xs:element name="IMOCompanyId" type="epc:token" />
  </xs:sequence>
</xs:complexType>
```

Representation:
The element shall contain contact information for the Company as defined in the OrganisationType and ContactInfoType elements, and the IMO company identification number.

7.2.3 epc:InmarsatCallNumberType – Inmarsat call number to ship

Definition:
This data type contains the Inmarsat call number for the ship if available. If not, it contains alternative instructions for calling.

Type:

```
<xs:complexType name="InmarsatCallNumberType">
  <xs:sequence>
    <xs:element name="Inmarsat" type="epc:string"/>
    <xs:element name="Alternative" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
The elements shall be used as follows.

— Inmarsat: Inmarsat call number. Note that one normally needs the extension code related to the area that the ship operates in. This extension code shall not be included in this number. If no number is available, the string should be empty.

— Alternative: Alternative contact information, e.g., via VHF, HF or MF radio.

7.2.4 epc:NameofMasterType – name of Master

Definition:
This is the port of registration for a ship.

Type:

```
<xs:simpleType name="NameOfMasterType">
  <xs:restriction base="epc:NameType"/>
</xs:simpleType>
```

Representation:
The data item contains country code and port code for the port of registration. The port name in human-readable format may also be included.

7.2.5 epc:RegistrationPortType – Port of Registration

Definition:
This is the port of registration for a ship.

Type:
```
<xs:complexType name="RegistrationPortType">
  <xs:complexContent>
    <xs:extension base="epc:PortType"/>
  </xs:complexContent>
</xs:complexType>
```
Representation:
The data item contains country code and port code for the port of registration. The port name in human-readable format may also be included.

7.2.6 epc:ShipIDType – Ship identity

Description:
This composite element contains data that can be used to identify the ship. Note that different users of this data structure require different minimum information elements.

Type:
```
<xs:complexType name="ShipIDType">
  <xs:sequence>
    <xs:element name="ShipName" type="epc:string"  minOccurs="0"/>
    <xs:element name="IMONumber" type="epc:token" minOccurs="0"/>
    <xs:element name="MMSINumber" type="epc:token" minOccurs="0"/>
    <xs:element name="CallSign" type="epc:token" minOccurs="0"/>
    <xs:element name="Comment" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The ShipIDType is represented as follows.

— ShipName: This is the name of the ship. This is in human-readable form and no special restrictions are enforced.

— IMONumber: This token consists of the string “IMO” followed by the seven-digit IMO number without any embedded separator character.

— MMSINumber: This token consists of the nine-digit MMSI number without any separator character.

— CallSign: This is the call sign for the ship. The call sign is at least four characters long and can consist of both letters and numbers.

— Comment: Any other information related to ship identity. This could, e.g., be used if an identity field is requested by a certain receiver, but is not available for this ship.

7.3 Cargo data types

7.3.1 Introduction

This section describes data types related to the general description of cargo and other goods stored onboard the ship. This clause will not define sufficient data objects to generally implement a full cargo manifest.

7.3.2 epc:CargoDataType – Detailed description of cargo

Definition:
This type can be used to describe cargo onboard a ship according to requirements in FAL 2 and 7 (dangerous cargo). This does not generally replace the manifest as the information is less detailed, but it can be looked at as a summary of the manifest. Typical uses include the calculation of port fees, statistical reporting, etc. The special cargo details block is optional. It gives additional information for dangerous goods, security, health and veterinary authorities for this cargo item. Each cargo item may have zero or one of this information.

Type:

```
<xs:complexType name="SpecialCargoDetailsType">
  <xs:sequence>
    <xs:element name="CargoInformationHolder" type="epc:ContactInfoType"/>
    <xs:element name="Consignor" type="epc:ContactInfoType" minOccurs="0"/>
    <xs:element name="Packer" type="epc:ContactInfoType" minOccurs="0"/>
    <xs:element name="PortOfLoading" type="epc:PortType"/>
    <xs:element name="OriginalPortOfShipment" type="epc:PortType"
                minOccurs="0"/>
    <xs:element name="OnBoardLocation" type="epc:CargoLocationType"
                minOccurs="0"/>
    <xs:element name="SafetyDataSheetReference" type="epc:AttachmentType"
                minOccurs="0"/>
    <xs:element name="DGSafetyDataSheet" type="epc:DGSafetyDataSheetType"
                minOccurs="0"/>
    <xs:element name="Comment" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="CargoItemType">
  <xs:sequence>
    <xs:element name="GoodsType" type="epc:GoodsTypeType"/>
    <xs:element name="PackageType" type="epc:PackageTypeContentType"/>
    <xs:element name="NoOfUnits" type="epc:int"/>
    <xs:element name="NoOfPackages" type="epc:int"/>
    <xs:element name="MarksAndNumber" type="epc:string"/>
    <xs:element name="SealNumber" type="epc:string" minOccurs="0"/>
    <xs:element name="GrossQuantity" type="epc:MeasureType"/>
    <xs:element name="NetQuantity" type="epc:MeasureType" minOccurs="0"/>
    <xs:element name="Measurements" type="epc:string" minOccurs="0"/>
    <xs:element name="TransportDocumentId" type="epc:string"/>
    <xs:element name="ItemNumber" type="epc:string" minOccurs="0"/>
    <xs:element name="PortOfDischarge" type="epc:PortType" minOccurs="0"/>
    <xs:element name="Consignee" type="epc:ContactInfoType" minOccurs="0"/>
    <xs:element name="SpecialCargoDetails"
                type="epc:SpecialCargoDetailsType" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="CargoDataType">
  <xs:sequence>
    <xs:element name="CargoItem" type="epc:CargoItemType"
                minOccurs="0" maxOccurs="unbounded"/>
```

```
    </xs:sequence>
  </xs:complexType>
```

Representation:
The cargo data contains a list of cargo item descriptions, one for each cargo item that is declared. A cargo item may in principle consist of several units (e.g., sacks of rice) which in turn may contain a number of packages. Each cargo data item contains the following information.

— GoodsType: This is a description of the goods type for this cargo item.

— PackageType: This is a description of the outer package of the cargo item.

— NoOfUnits: This is the number of cargo units that this item declaration covers.

— NoOfPackages: This is the total number of packages on all cargo units covered by this cargo item.

— MarksAndNumbers: Marks and numbers of the cargo item. For containers, this shall be the identification code as defined in ISO 6346.

— SealNumber: If the cargo item is sealed, usually for containers, the seal number shall be entered here.

— GrossQuantity: Gross quantity of cargo item.

— NetQuantity: Optionally, the net quantity can also be entered.

— Measurements: The physical size of the cargo item, where applicable. This should be omitted, e.g., for bulk cargo.

— TransportDocumentId: Transport document, e.g. bill of lading, identity code.

— ItemNumber: Reference to this cargo item's location in the transport document.

— PortOfDischarge: This is the identity of the port where the cargo will be discharged from the ship. This element may be empty if the discharge port is the port being reported to.

— Consignee: This field is required by some authorities, although it is not required by the FAL Convention. Note that it may also be required for certain types of dangerous and polluting cargo.

— SpecialCargoDetails: This data item shall be included if the cargo contains dangerous goods. See below for a description of the fields of that data type.

The special cargo details data type can be used for dangerous cargo (IMDG) or other cargo that falls under the MARPOL convention. The data fields are as follows.

— CargoInformationHolder: This is the contact information for the person/organization that can provide information about the cargo. This may, e.g., be the manufacturer.

— Consignor: This is the contact information for the consignor/shipper.

— Packer: This is the contact information for the packer of the goods if different from Consignor.

— PortOfLoading: This is the identity of the port where the cargo was loaded onboard the ship.

— OriginalPortOfShipment: This is necessary when a goods item originates from another port than PortOfLoading, e.g. after a trans-shipment.

— OnBoardLocation: This is the onboard location of the cargo. See data type definition for details.

— SafetyDataSheetReference: Reference to the physicochemical characteristics of the product if required and if provided as, e.g. a printed sheet. If it is electronic information, the next entry shall be used.

— DGSafetyDataSheet: This is the electronic safety data sheet for dangerous cargo. If the information is not available in the EPC format, reference information can be provided in the previous tag.

— Comment: Additional information, if provided.

NOTE A complete description of cargo in this format will make the dangerous cargo manifest superfluous. Note, however, that authorities can require both.

7.3.3 epc:CargoLocationType – Cargo Location Type

Definition:
This data type contains the location of a cargo item onboard the ship. The description format is dependent on the cargo unit type (container, bulk, etc.) as well as the type of ship (RORO, deep sea container, feeder, etc.).

Type:

```
<xs:simpleType name="CargoLocationType">
  <xs:restriction base="epc:string"/>
</xs:simpleType>
```

Representation:
CargoLocationType is a string with one upper case letter specifying the type of location code, a colon (:) and then the actual location code. The following clauses specify the type of coding, the coding letter and the format of the code.

— Container ship – Code “C”: A string of digits in the form BBRRTT where BB is the bay number, RR is the row number and TT is the tier number. This shall be coded according to ISO 9711-1. This includes leading zeros where necessary. As an example, “C:010212” means container in bay 1, row 2 and tier 12.

— Container feeder – Code “F”: A string of digits in the form HHHTTRR where HHH is the hatch number, TT is the tier number and RR is the row number. All fields shall be filled with leading zeros. As an example “F:0010204” means hatch 1, tier 2 and row 4.

— RORO – Code “R”: A string of digits in the form DDBBBRRTT where DD is deck, BBB is bay, RR is row and TT is tier. As an example “R:030100204” means deck 3, bay 10, row 2 and tier 4.

— General cargo – Code “G”: A string of characters in the format CCS or CCSDDD, where CC is the cell number, S is side of ship (“S” – starboard, “P” – port side and “C” – centre), and DDD is an optional code specifying deck (WED – weather deck, TDn – tween deck n, where n is a digit zero to nine and LOH is lower hold deck).

— Bulk vessel, including tankers – Code “B”: The tank or hold number as numeral or other coding as used onboard.

— Other – Code “O”: Free text description.

7.3.4 epc:CargoOverviewType – Brief description of onboard cargo

Definition:
This is a short text giving a human-readable overview of what cargo the ship carries. This shall also contain brief details of any harmful substances and gases that could endanger persons or the environment.

Type:

```
<xs:simpleType name="CargoOverviewType">
  <xs:restriction base="epc:string"/>
</xs:simpleType>
```

Representation:
This is a free text for human consumption. The text may include special characters such as new line.

7.3.5 epc:CargoTypeContentType – Type of cargo

Definition:
This element encodes cargo type.

Type:

```
<xs:simpleType name="CargoTypeContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The element shall contain the one-digit cargo type code defined in Annex I of UNECE R21. An overview of the codes is given in Annex G.

7.3.6 epc:DGSafetyDataSheetType – Safety data related to dangerous goods

Definition:
This type refers to physicochemical characteristics of products. It is an electronic alternative to a printed safety data sheet.

Type:

```
<xs:simpleType name="PackingGroupCodeContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="I"/>
    <xs:enumeration value="II"/>
    <xs:enumeration value="III"/>
    <xs:enumeration value="None"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="DGSafetyDataSheetType">
  <xs:sequence>
    <xs:element name="ProperShippingName" type="epc:string" />
    <xs:element name="UNNumber" type="epc:token" />
    <xs:element name="UNClass" type="epc:UNHazardClassContentType" />
    <xs:element name="PackingGroup"
                type="epc:PackingGroupCodeContentType" />
    <xs:element name="SubsidiaryRisks" type="epc:UNHazardClassContentType"
                minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="FlashPoint" type="epc:decimal" minOccurs="0"/>
    <xs:element name="MARPOLPollutionCode"
                type="epc:MARPOLPollutionCodeContentType"
                minOccurs="0"/>
    <xs:element name="EmergencyInstruction"
                type="epc:string" minOccurs="0"/>
    <xs:element name="SegregationInformation" type="epc:string"
                minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The data sheet for dangerous goods safety contains information for safe handling of dangerous goods. The data elements are as follows.

— ProperShippingName: This is the substance name, that is, the formal shipping name, e.g. “Dimethylhydrazine, unsymmetrical” as defined in IMDG.

— UNNumber: This is the UN dangerous goods unique number as defined in IMDG. This is a four-digit number prefixed with “UN”, e.g., “UN1163”. The leading UN shall be included in the token. If the material does not have a UN code, the tag shall be empty.

— UNClass: Contains the UN Hazard Code for this cargo as defined in IMDG. It specifies the hazard code for the actual substance. Subsidiary hazard codes may be added where applicable in the SubsidiaryRisks data items.

— PackingGroup: Packing danger group code as appropriate and as defined in IMDG. If there is no packing group assigned, the tag shall be empty.

— SubsidiaryRisks: This field specifies additional hazard codes associated with the goods, if applicable. More than one code can be listed. If no subsidiary risk exists, the tag shall be omitted.

— FlashPoint: Flash point in degrees centigrade, if applicable. Shall be omitted if not applicable.

— MARPOLPollutionCode: This code applies to noxious liquid substances as defined in MARPOL, Annex II.

— EmergencyInstructions: Additional instructions on emergency handling of this item in free text.

— SegregationInformation: Additional information on segregation of this cargo item in free text.

7.3.7 epc:DutiableCrewEffectType – List of crew effects that may be dutiable

Definition:
This is a list of crew effect items as specified in FAL 4. The list contains all crew effects that may be dutiable. The list may be empty, but the top level tag shall occur exactly once. The list is intended for human consumption, and it does not use a code table for types of dutiable goods.

Type:

```
<xs:complexType name="CrewEffectItemType">
  <xs:sequence>
    <xs:element name="CrewReference" type="epc:CrewReferenceType"/>
    <xs:element name="Name" type="epc:NameType"  minOccurs="0" />
    <xs:element name="Duty" type="epc:CrewDutyType" minOccurs="0" />
    <xs:element name="EffectDescription" type="epc:string"/>
    <xs:element name="Measurement" type="epc:MeasureType"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="DutiableCrewEffectsType">
  <xs:sequence>
    <xs:element name="CrewEffectItem" type="epc:CrewEffectItemType"
                minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The CrewEffectItemType shall contain one type of crew effect for one specific crew member. Thus, if one crew member possesses, e.g., both cigarettes and alcohol, the list shall contain two entries with the same CrewReference value. The tags are as follows.

— CrewReference: This tag points to the specific crew member in the crew list. This corresponds to the crew number field in FAL 4.

— Name: The name of the crew member. If supplied, it shall be identical to the name listed in the crew list.

— OnBoardDuty (Text). Description of the crew member's duty onboard. If supplied, it shall be identical to the name listed in the crew list.

— EffectDescription tag contains the description of the type of possible dutiable or prohibited item in a human-readable format.

— Measurement: This field specifies the quantity.

The list shall contain all crew effects that may be dutiable or prohibited.

NOTE Crew name and rank is included here as it is included in FAL 4. However, if the crew list is also supplied, these fields are superfluous. Authorities can still require all fields in both structures.

7.3.8 epc:GeneralDescriptionOfDGType – General description of dangerous cargo

Definition:
The data element shall contain a list of all dangerous goods onboard the ship.

Type:

```
<xs:complexType name="DGInfoType">
  <xs:sequence>
     <xs:element name="UNHazardClass" type="epc:UNHazardClassContentType"
                 minOccurs="0"/>
     <xs:element name="MARPOLCode" type="epc:MARPOLPollutionCodeContentType"
                minOccurs="0"/>
     <xs:element name="Description" type="epc:string" minOccurs="0"/>
     <xs:element name="Measure" type="epc:MeasureType"/>
     <xs:element name="Remarks" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="GeneralDescriptionOfDGType">
  <xs:sequence>
    <xs:element name="DGInfo" type="epc:DGInfoType"
                minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
Each element of the list shall contain the UN hazard class, the MARPOL code or a Description entry as well as the total amount of the material onboard (Measure). An optional Remarks can give human-readable additional information where relevant.

The list shall contain all dangerous goods onboard. Each entry represents one class of hazardous goods. It is legal to have several entries with the same hazard class. Thus, to find the complete amount onboard of goods of a given hazard class, the measurements of all items with the same hazard class need to be added together.

NOTE One can, for various reasons, divide one type of goods into different entries, e.g., if they are stored in different compartments. In this case, the comment would normally distinguish between the entities.

7.3.9 epc:GoodsTypeType – Type of goods based on HS

Definition:
This type contains a reference to the actual goods type for the cargo item. The coding is based on the World Customs Organization coding scheme, but can also be used for other purposes than customs clearance.

Type:

```
<xs:complexType name="GoodsTypeType">
  <xs:sequence>
    <xs:element name="HSCode" type="epc:token"/>
    <xs:element name="Description" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
HSCode is a WCO Harmonized System (WCO HS) compliant code. This standard requires the use of a period (.) between the four first digits (heading) and the next two digits (sub-heading). Additional code digits may be added after the sub-heading after a new period (.). The sub-heading and associated period is optional. Thus, the codes “3913” (Natural polymers), “3913.10” (Alginic acid, its salts and esters) and “3913.10.10” (Sodium alginate) are all legal codes. Description is an optional free text description of the goods.

7.3.10 epc:MARPOLPollutionCodeContentType – MARPOL pollution code

Definition:
This element encodes the MARPOL code for noxious liquid substances.

Type:

```
<xs:simpleType name="MARPOLPollutionCodeContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="X"/>
    <xs:enumeration value="Y"/>
    <xs:enumeration value="Z"/>
    <xs:enumeration value="OS"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The code values are those defined in MARPOL, Annex II.

7.3.11 epc:PackageTypeContentType – Type of cargo package

Definition:
This element encodes cargo package type.

Type:

```
<xs:simpleType name="PackageTypeContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The element shall contain the two-letter alphabetic code of Annex V of UNECE R21. Examples of some of the codes are given in Annex G.

7.3.12 epc:ShipStoreType – Description of ship's dutiable stores

Definition:
This is a description of the dutiable stores that the ship carries. This is a list of the ship's stores, including type, quantity and location onboard according to FAL 3.

Type:

```
<xs:complexType name="ShipStoreItemType">
  <xs:sequence>
    <xs:element name="Description" type="epc:string"/>
    <xs:element name="Measurement" type="epc:MeasureType"/>
    <xs:element name="LocationOfStorage" type="epc:string"/>
```

```
  </xs:sequence>
</xs:complexType>

<xs:complexType name="ShipStoreType">
  <xs:sequence>
    <xs:element name="StoreItem" type="epc:ShipStoreItemType" minOccurs="0"
                maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This data structure contains information that is for human consumption. Thus, the fields, except measurement, are in free text format.

7.3.13 epc:UNHazardClassContentType – UN dangerous goods hazard class

Definition:
This type contains the hazard class for dangerous goods.

Type:

```
<xs:simpleType name="UNHazardClassContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The enumeration contains the UN Hazard classes as defined in IMDG. The format of the string shall be exactly as defined in the IMDG Code, without the explanatory text. If the material does not have a hazard class, the tag shall be empty. For information, the currently defined codes are listed in Annex I.

7.4 Crew and passenger data

This section contains data types containing information related to the crew.

7.4.1 epc:CrewDutyType – Duty onboard or on shore

Definition:
This data type specifies the duty of a person. Most codes are for onboard duties, but Company Security Officer and Agent can also be used in conjunction with ISPS code.

Type:

```
<xs:complexType name="CrewDutyType">
  <xs:sequence>
    <xs:element name="Code" type="epc:token"/>
    <xs:element name="Text" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
The two fields shall be used as follows:

- Code: This is the crew duty type in coded representation. A list of onboard duty codes is defined in Annex C.

- Text: This is the crew duty in free text. It is optional if a valid coded value is supplied. If supplied and if corresponding to the code in Annex C, it should contain the same textual description as in the annex.

7.4.2 epc:CrewListType – Information about all crew onboard

Definition:
CrewDataType is a list of information items, one for each crew member onboard the ship. This list is needed in FAL 1, FAL 4 and ISPS. FAL 4 (crew effects) requires a reference to the crew in question by including the crew's number on the crew list (entry number in FAL 5).

Type:

```
<xs:complexType name="CrewMemberDataType">
  <xs:sequence>
    <xs:element name="CrewReference" type="epc:CrewReferenceType"/>
    <xs:element name="CrewIdDocument" type="epc:PersonIdDocumentType"/>
    <xs:element name="Name" type="epc:NameType"/>
    <xs:element name="Gender" type="epc:GenderContentType" minOccurs="0"/>
    <xs:element name="Duty" type="epc:CrewDutyType"/>
    <xs:element name="DateOfBirth" type="epc:date"/>
    <xs:element name="PlaceOfBirth" type="epc:string"/>
    <xs:element name="CountryOfBirth" type="epc:CountryCodeContentType"/>
    <xs:element name="Nationality" type="epc:CountryCodeContentType"/>
    <xs:element name="CountryOfResidence"
                type="epc:CountryCodeContentType" minOccurs="0"/>
    <xs:element name="EmbarkationPort" type="epc:PortType" minOccurs="0"/>
    <xs:element name="EmbarkationDate" type="epc:date" minOccurs="0"/>
    <xs:element name="DebarkationPort" type="epc:PortType" minOccurs="0"/>
    <xs:element name="DebarkationDate" type="epc:date" minOccurs="0"/>
    <xs:element name="Remarks" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="CrewListType">
  <xs:sequence>
    <xs:element name="CrewMemberData" type="epc:CrewMemberDataType"
                minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
NumberOfCrew is the total number of crew onboard the ship. One CrewMemberData element exists for each of the crew members. This data element contains the following elements:

— CrewReference: This is the crew reference that uniquely identifies each of the crew members onboard the ship.

— CrewIdDocument: This is the reference to the person's identification document.

— Name: This is the name of the person.

— Gender: This is the gender of the person[6)].

— CrewDuty: Crew duty or rank.

— DateOfBirth: Date of birth as a date type.

— PlaceOfBirth: Place of birth, city name or similar.

— CountryOfBirth: Country code for country of birth.

6) This data structure contains more information than what is required by FAL 5. Elements that are not required by FAL 5 are defined as optional (minOccurs = “0”).

— Nationality: Two-letter country code for nationality.

— CountryOfResidence: Two-letter country code for country of residence.

— EmbarkationPort: Port where the crew member embarked the ship.

— DebarkationPort: Port where the crew member debarked the ship.

— EmbarkationTime: Date and time when the crew member embarked the ship.

— DebarkationTime: Date and time when the crew member debarked the ship.

— Remarks: Additional and optional information.

7.4.3 epc:CrewReferenceType – Reference to a crew member

Definition:
This data type is used as a reference to a specific crew member. It will be defined in the crew list as a unique code for each crew member. The code can be used in other data objects to give a reference to this crew member.

Type:
```
<xs:simpleType name="CrewReferenceType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The reference code is an arbitrary, but unique, string within the list of crew members. A typical reference code may be the number of this crew on the crew list.

7.4.4 epc:PassengerReferenceType – Reference to a passenger member

Definition:
This data type is used as a reference to a specific passenger. It will be defined in the passenger list as a unique code for each passenger. The code can be used in other data objects to give a reference to this passenger.

Type:
```
<xs:simpleType name="PassengerReferenceType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The reference code is an arbitrary, but unique, string within the list of passengers. A typical reference code may be the number of this passenger on the passenger list.

7.4.5 epc:PassengerListType – Information about passengers

Definition:
The passenger data may contain one or more records of the general passenger data item.

Type:
```
<xs:complexType name="PassengerDataType">
  <xs:sequence>
    <xs:element name="PassengerReference"
                type="epc:PassengerReferenceType" minOccurs="0" />
    <xs:element name="PassengerIdDocument" type="epc:PersonIdDocumentType"
                minOccurs="0" />
    <xs:element name="Name" type="epc:NameType"/>
```

```
      <xs:element name="Gender" type="epc:GenderContentType" minOccurs="0" />
      <xs:element name="DateOfBirth" type="epc:date"/>
      <xs:element name="PlaceOfBirth" type="epc:string"/>
      <xs:element name="CountryOfBirth" type="epc:CountryCodeContentType"/>
      <xs:element name="Nationality" type="epc:CountryCodeContentType"
                  minOccurs="0" />
      <xs:element name="CountryOfResidence" type="epc:CountryCodeContentType"
                  minOccurs="0" />
      <xs:element name="EmbarkationPort" type="epc:PortType" minOccurs="0"/>
      <xs:element name="EmbarkationDate" type="epc:date" minOccurs="0"/>
      <xs:element name="DebarkationPort" type="epc:PortType" minOccurs="0"/>
      <xs:element name="DebarkationDate" type="epc:date" minOccurs="0"/>
      <xs:element name="HomeAddress" type="epc:PostalAddressType"
                        minOccurs="0"/>
      <xs:element name="VisitAddress" type="epc:PostalAddressType"
                        minOccurs="0"/>
      <xs:element name="Transit" type="epc:boolean" />
      <xs:element name="Remarks" type="epc:string" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>

  <xs:complexType name="PassengerListType">
    <xs:sequence>
      <xs:element name="PassengerData" type="epc:PassengerDataType"
                  minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
```

Representation:
The passenger data list contains a list of passenger data items according to FAL 6 requirements. Each passenger data item has the following components.

— PassengerReference: This is the unique identifier that identifies a single passenger on the list of all passengers[7)].

— PassengerIdDocument: This is the reference to the identification document for this passenger.

— Name: This is the name of the passenger.

— Gender: This is the gender of the passenger[7)].

— DateOfBirth: This is the date of birth for this passenger.

— PlaceOfBirth: This is the place of birth, for instance the city.

— CountryOfBirth: This is the two-letter code for the country of birth for this passenge[7)].

— Nationality: This is the two-letter country code representing the nationality of this passenger.

— CountryOfResidence: This is the two-letter country code representing the country of residence for this passenger[7)].

— EmbarkationPort: This is the port of embarkation.

— DebarkationPort: This is the port of debarkation.

7) This data structure contains more information than what is required by FAL 6. Elements that are not required by FAL 6 are marked as optional (minOccurs = “0”).

— EmbarkationTime: This is the time when the passenger is embarking the ship[7)].

— DebarkationTime: This is the time when the passenger is debarking the ship[7)].

— HomeAddress: This is the home address for this passenger[7)].

— VisitAddress: This is the address for the passenger's first stay in the country of arrival[7)].

— Transit: Shall be true if the passenger is a transit passenger in this port call, i.e., if the passenger enters the ship again before departure.

— Remarks: Optional remarks, e.g., if the passenger requests special assistance, instructions can be entered into this field[7)].

7.4.6 epc:PersonIdDocumentType – Identification papers for a person

Description:
This data type contains information about the personal identity papers carried by a specific person on a ship.

Type:

```
<xs:simpleType name="IdDocumentCodeContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="MusterBook"/>
    <xs:enumeration value="Passport"/>
    <xs:enumeration value="ResidentialPermit"/>
    <xs:enumeration value="PictureId"/>
    <xs:enumeration value="Other"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="PersonIdDocumentType">
  <xs:sequence>
    <xs:element name="IdDocument" type="epc:IdDocumentCodeContentType"/>
    <xs:element name="IdNumber" type="epc:string"/>
    <xs:element name="IssueDate" type="epc:date"/>
    <xs:element name="IssuingCountry" type="epc:CountryCodeContentType"/>
    <xs:element name="ExpirationDate" type="epc:date" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
The types of documents are a muster book, passport or other legal identity card with picture. If none of this is available, the code “Other” shall be used. In this case, the other fields cannot be relied on. The identity number is the identity code of the specified document. Issue and expiration dates are transferred as said, but the expiration date may be omitted. Issuing country is coded in the normal two-letter country-code.

The types of identity cards are as follows.

— MusterBook: Mariner's document.

— Passport: Valid passport.

— ResidentialPermit: A residential permit, normally issued by a national authority to a foreigner.

— PictureID: Other valid governmental issued identification.

— Other: Other types of identification.

7.4.7 epc:PersonsOnboard – Number of persons onboard

Definition:
This data item is used to specify the number of persons onboard. It is divided into passenger and crew counts. Any of these can be omitted.

Type:

```
<xs:complexType name="PersonsOnboardType">
  <xs:sequence>
    <xs:element name="Passengers" type="epc:int" minOccurs="0" />
    <xs:element name="Crew" type="epc:int" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
This shall contain the total number of persons onboard.

7.5 Class and certificates

This section defines data types that represent the ship's class approval status as well as certificates and approval status.

For certificates, tag names are defined in Annex A and are not specifically listed here. See 7.5.1 for more information.

7.5.1 Certificate – Any certificate

Definition:
Specific certificates are not defined as types in this part of ISO 28005. Only the generic certificate type is defined as CertificateType. However, Annex A gives default names for specific certificate data items.

Type (example):

```
      …
<xs:element name="RegistryCertificate" type="CertificateType"/>
<xs:element name="SafetyManagementCertificate" type="CertificateType"/>
<xs:element name="AnyCertificate" type="CertificateType"/>
      …
```

Representation:
The above XSD code shows how two specific and one general certificate data items can be specified in the definition of e.g. an XML message. See 7.3.2 for definition of contents. If a specific certificate is needed in an XML message, the tag name shall be the one listed in Annex A under the column heading “Tag name”. It is also possible to specify a “generic” certificate, e.g. with the tag name “AnyCertificate”. In this case, the certificate type can be determined from the embedded certificate type code.

7.5.2 epc:CertificateType – Certificate description

Definition:
This data type is used to give details about a specific certificate. Annex A lists all certificates that are defined for use in this part of ISO 28005, but additional certificates can be added by using the code “Other”.

Type:

```
<xs:simpleType name="CertificateCodeContentType" type="epc:token" />

<xs:simpleType name="epc:CertificateStatusContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="Approved"/>
    <xs:enumeration value="Intermediate"/>
    <xs:enumeration value="USCGApproved"/>
```

```
      <xs:enumeration value="Exemption"/>
      <xs:enumeration value="Other"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="CertificateIssuerTypeContentType">
    <xs:restriction base="epc:token">
      <xs:enumeration value="Flag"/>
      <xs:enumeration value="Class"/>
      <xs:enumeration value="RO"/>
      <xs:enumeration value="RSO"/>
      <xs:enumeration value="Other"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:complexType name="CertificateType">
    <xs:sequence>
      <xs:element name="Name" type="epc:string"/>
      <xs:element name="Code" type="epc:CertificateCodeContentType"/>
      <xs:element name="CertificateStatus"
                  type="epc:CertificateStatusContentType"/>
      <xs:element name="Restrictions" type="epc:string" minOccurs="0"/>
      <xs:element name="IssueDate" type="epc:date"/>
      <xs:element name="ExpiryDate" type="epc:date"/>
      <xs:element name="ExtendedUntil" type="epc:date" minOccurs="0"/>
      <xs:element name="LastEndorsementDate" type="epc:date" minOccurs="0"/>
      <xs:element name="Issuer" type="epc:OrganisationType"/>
      <xs:element name="IssuerType"
                  type="epc:CertificateIssuerTypeContentType "/>
      <xs:element name="Comment" type="epc:string" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
```

Representation:
The elements of this data type are as follows.

— Name: This is the name of the certificate as it is normally written in English. This is to be read by humans.

— Code: This field shall contain a code as defined in Annex A.

— CertificateStatus: This element shall contain one of the specified codes. “Approved” and “Exemption” are generally useful for many certificates, while “Intermediate” and “USCGApproved” are usually only appropriate for international ship safety certificates.

— Restrictions: This can be used to specify any restrictions in force with regards to the certificate.

— IssueDate, ExpiryDate, ExtendedUntil and LastEndorsementDate: These are the dates that may apply to the certificate's validity.

— Issuer: This is the description of the issuing body. This should, for most certificates, be the flag state but, if issued by a recognized organization, the field shall contain the description and type of organization in the IssuerType field.

— IssuerType: This is the type of organization. RO or RSO should be used instead of class when class operates on behalf of a flag state.

— Comment: This field can be used to give additional information and is in human-readable format.

7.5.3 epc:ShipClassType – Class Notation for Ship

Definition:
This is the class society and the class notation for the ship.

Type:

```
<xs:simpleType name="ClassSocietyContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>

<xs:complexType name="ShipClassType">
  <xs:sequence>
    <xs:element name="SocietyName" type="epc:string"/>
    <xs:element name="SocietyCode" type="epc:ClassSocietyContentType"/>
    <xs:element name="Country" type="epc:CountryCodeContentType"/>
    <xs:element name="Notation" type="epc:string"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The SocietyName is the printable name of the classification society. The SocietyCode is the corresponding code as defined in Annex A. The country is the country where the class society resides and the Notation is the class notation as a printable text string.

7.5.4 epc:INFClassContentType – Irradiated nuclear fuel class

Definition:
This enumerated type contains the codes for the license of the vessel according to the INF Code.

Type:

```
<xs:simpleType name="INFClassContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="INF0"/>
    <xs:enumeration value="INF1"/>
    <xs:enumeration value="INF2"/>
    <xs:enumeration value="INF3"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The codes correspond to the INF classifications in the above-referenced INF Code. INF0, if used, means that the ship is not certified to carry this type of cargo.

7.6 Security data types

7.6.1 epc:CurrentPortSecurityLevelType – Current security level on ship

Definition:
This type contains the port's current security level as defined in the ISPS standard.

Type:

```
<xs:simpleType name="CurrentPortSecurityLevelType">
  <xs:restriction base="epc:SecurityLevelContentType"/>
</xs:simpleType>
```

Representation:
This is the port's current security level according to the ISPS standard.

7.6.2 epc:CurrentShipSecurityLevelType – Current security level in port

Definition:
This type contains the ship's current security level according to the ISPS standard.

Type:

```
<xs:simpleType name="CurrentShipSecurityLevelType">
  <xs:restriction base="epc:SecurityLevelContentType"/>
</xs:simpleType>
```

Representation:
This is the ship's current security level according to the ISPS standard.

7.6.3 epc:PortCallsType – Last ten port calls

Definition:
This data type contains a list of the last ten port calls with arrival and departure times, security level and additional security measures.

Type:

```
<xs:complexType name="ShipToPortActivityType">
  <xs:sequence>
    <xs:element name="FromDateTime" type="epc:dateTime"/>
    <xs:element name="ToDateTime" type="epc:dateTime"/>
    <xs:element name="Port" type="epc:PortType"/>
    <xs:element name="PortSecurityLevel"
                type="epc:CurrentPortSecurityLevelType"/>
    <xs:element name="AdditionalSecurityMeasures" type="epc:string"
                      minOccurs="0" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="PortCallListType">
   <xs:sequence>
      <xs:element name="PortCall" type="epc:ShipToPortActivityType"
                  maxOccurs="10"/>
   </xs:sequence>
</xs:complexType>
```

Representation:
This type is used to list the last ten port calls, with information on arrival and departure times, port name, facility name and location codes, security in effect at port at that time and if any special security measures were taken during call. If none, this field should be left out or be empty.

7.6.4 epc:ShipToShipActivityListType – Ship-to-ship activities

Definition:
This data type contains a list with the description of recent ship-to-ship activities and any security measures applied during these activities.

```
<xs:complexType name="epc:ShipToShipActivityType">
  <xs:sequence>
    <xs:element name="FromDateTime" type="epc:dateTime"/>
    <xs:element name="ToDateTime" type="epc:dateTime"/>
    <xs:element name="Location" type="epc:LocationType"/>
    <xs:element name="Activity" type="epc:string" />
    <xs:element name="AdditionalSecurityMeasures" type="epc:string"
                minOccurs="0"/>
  </xs:sequence>
```

```
</xs:complexType>

<xs:complexType name="ShipToShipActivityListType">
   <xs:sequence>
      <xs:element name="ShipToShipActivity"
                  type="epc:ShipToShipActivityType"
                  minOccurs="0" maxOccurs="unbounded"/>
   </xs:sequence>
</xs:complexType>
```

Representation:
This data type is used to describe a ship-to-ship activity. The description shall contain the time and date when activity started and ended, the position and/or location (at least one), what activity was performed and if any special security measures were taken. The latter field shall be omitted or be empty if no special measures applied.

7.6.5 epc:HasSecurityPlanType – Approved security plan

Definition:
This data type indicates if the ship has an approved security plan.

```
<xs:simpleType name="HasSecurityPlanType">
  <xs:restriction base="epc:boolean"/>
</xs:simpleType>
```

Representation:
True if the ship has a security plan, False if the ship does not have a security plan.

7.6.6 epc:SecurityLevelContentType – ISPS security level

Definition:
This type contains the security level on ships or in ports as defined in the ISPS code.

Type:

```
<xs:simpleType name="SecurityLevelContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="SL0"/>
    <xs:enumeration value="SL1"/>
    <xs:enumeration value="SL2"/>
    <xs:enumeration value="SL3"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
This type enumerates the security levels according to the ISPS code. The codes used are

a) SL0: below normal security level (i.e. minimum requirements for security level 1 are not met),

b) SL1: normal security level,

c) SL2: heightened security level, and

d) SL3: exceptional security level.

7.7 Service-related data types

7.7.1 epc:JournalNumberType – Unique identifier for a port call

Definition:
This data items contains an identifier issued by the port authorities referencing a ship's particular call in a particular port. It shall be used as a unique identifier for the port clearance requests sent by the ship.

Type:

```
<xs:simpleType name="JournalNumberType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The journal number is a computer-recognizable string that is used to identify a ship's application for port clearance.

NOTE This code is used by the port to identify a ship's port call. The ship normally uses the VoyageNumber (see 7.9.28) to identify a voyage between ports.

7.7.2 epc:MessageHeaderType – Standard header for an EPC message

Definition:
This data item contains mandatory reference information for an EPC message. The same format shall be used by ships and port authorities.

Type:

```
<xs:simpleType name="MessageTypeContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>

<xs:complexType name="EPCMessageHeaderType">
  <xs:sequence>
    <xs:element name="ShipMessageId" type="epc:token" />
    <xs:element name="JournalNumber" type="epc:JournalNumberType"
                minOccurs="0"/>
    <xs:element name="SenderName" type="epc:NameType" minOccurs="0" />
    <xs:element name="SenderDuty" type="epc:CrewDutyType" minOccurs="0" />
    <xs:element name="MessageType" type="epc:MessageTypeContentType" />
    <xs:element name="ReportingSystem" type="epc:ReportingSystemType"
                minOccurs="0"/>
    <xs:element name="ArrivalDeparture" type="epc:ArrivalDepartureType"
                minOccurs="0"/>
    <xs:element name="Version" type="epc:VersionType" />
    <xs:element name="SentTime" type="epc:dateTime" />
    <xs:element name="ReplyURI" type="epc:anyURI" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This data item contains general information required to process an incoming message. The data elements are as follows.

— ShipMessageId: A unique identifier assigned by the ship as a reference to a message sent from the ship. Any messages sent in reply to this message shall contain the same identifier. The ship should use different IDs for all messages, although the messages refer to the same port call or reporting system passage.

NOTE 1 The messaging system is strictly a server/client system where the ship is the client. Thus, all messages from the shore (server) will be referenced to one ship message. Also, if there is a problem with the shore side message, the ship needs to manually contact the shore side server system to resolve the problem.

— JournalNumber: This data element contains an identifier issued by the port or reporting system authorities referencing a ship's particular call in a particular port or a particular passage through a reporting system. It shall be used as a unique identifier in all messages relating to this port call or passage by both ship and port/reporting system. It can be omitted in the first request from the ship.

— SenderName/SenderDuty: Name and crew duty for sending person. Used in most forms to identify the person responsible for the contents.

— MessageType: This field contains a message type code. The currently allowed types are defined in Annex E. Additional codes may be defined in later editions of this International Standard or in other standards.

— ReportingSystem: Name of reporting system, if appropriate. This is used for all ship reporting messages.

— ArrivalDeparture: This flag shall be used in the cases where the same message may be used both for arrival and departure.

— Version: This is the version code the sender used when formatting the message.

— SentTime: This is date and time when this message was sent from the ship or port/reporting system.

— ReplyURI: This is an address to which any reply to the message should be sent. The ship should always use this code, while the port/reporting system may omit it if messages are always sent to a fixed URI.

NOTE 2 To ensure compatibility, it is recommended that this be a valid e-mail address with only seven-bit (“ASCII”) characters.

7.7.3 epc:OtherServiceRequestType – Additional service request

Definition:
This data item can be used to request other services that require clearance from a port or port authority. These can be tugs, pilots, linesmen or other facilities.

Type:

```
<xs:simpleType name="OtherServiceContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>

<xs:complexType name="OtherServiceRequestType">
  <xs:sequence>
    <xs:element name="ServiceType" type="epc:OtherServiceContentType" />
    <xs:element name="Description" type="epc:string"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The ServiceType element contains one of the codes from Annex F. Other codes could be added by revisions of this part of ISO 28005 or other standards. The Description gives a description of how the service should be provided. It also needs to specify the service when the service type code “Other” is used.

7.7.4 epc:ReportingSystemType – Identification of reporting system

Definition:
This data item contains mandatory reference information for an EPC message. The same format shall be used by ship and port authorities.

Type:

```
<xs:simpleType name="ReportingSystemType">
```

```
    <xs:restriction base="epc:string"/>
  </xs:simpleType>
```

Representation:
This data item contains the name of a reporting system as defined in the corresponding IMO resolution or a name for, e.g., voluntary ship reporting systems, such as AMVER. The name shall be encoded exactly as in the corresponding reporting requirements without any additional space or other formatting characters.

7.7.5 epc:RequestStatusTypeContentType – Status of a service request

Definition:
This data item is used to report back status of a request from a ship to a port or a ship reporting system.

Type:

```
  <xs:simpleType name="RequestStatusTypeContentType">
    <xs:restriction base="epc:token">
      <xs:enumeration value="Discarded"/>
      <xs:enumeration value="Pending"/>
      <xs:enumeration value="Accepted"/>
      <xs:enumeration value="NotAccepted"/>
      <xs:enumeration value="AcceptedWithConditions"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:complexType name="RequestStatusType">
    <xs:sequence>
      <xs:element name="Status" type="epc:RequestStatusTypeContentType"/>
      <xs:element name="Comment" type="epc:string" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
```

Representation:
The status field is an enumerated type that shall contain one of the allowed code values. The “Discarded” code is used if the message for some reason was not understood, e.g. because receiver did not understand the specified message type or if the version code was incompatible. The “Pending” code is used if the message was received and understood, but final acceptance and rejection will be sent at a later time. The three remaining codes are used to indicate acceptance, part acceptance or rejection. If the request is not accepted or only partly accepted, the remarks field shall explain how and why restrictions apply or the reason for discarding the message. For “Pending”, the field may indicate when a final answer can be expected.

7.8 Ship particular types

7.8.1 epc:BeamType – Beam of vessel

Description:
This is the width of the vessel at its widest point or at the midpoint. It does not cover cargo that extends over the ship's fixed beam.

Type:

```
  <xs:simpleType name="BeamType">
    <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
The ship's beam as described above, measured in metres.

7.8.2 epc:DeadWeightType – Dead weight

Description:
Dead weight of ship.

Type:

```
<xs:simpleType name="DeadWeightType">
  <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
Dead weight, measured in metric tonnes.

7.8.3 epc:DoubleBottomContentType – Double bottom or sides indicator

Description:
This enumerated type lists possible values for double bottoms or hulls. It is normally only used for tankers.

Type:

```
<xs:simpleType name="DoubleBottomContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="DoubleHull"/>
    <xs:enumeration value="DoubleBottom"/>
    <xs:enumeration value="SingleHull"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The following codes are valid:

— DoubleHull: Ship has double bottom and sides.

— DoubleBottom: Ship has double bottom only.

— SingleHull: Normal single-hull ship.

7.8.4 epc:GrossTonnageType – Gross tonnage

Description:
This is the gross tonnage as defined by The International Convention on Tonnage Measurement of Ships.

Type:

```
<xs:simpleType name="GrossTonnageType">
  <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
Gross tonnage, as defined in the convention.

7.8.5 epc:IceClassType – Ship ice class

Description:
This data type contains one or more ice class codes for the ship.

Type:

```
<xs:simpleType name="IceClassBalticContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="A1"/>
    <xs:enumeration value="A1Super"/>
    <xs:enumeration value="B1"/>
    <xs:enumeration value="C1"/>
    <xs:enumeration value="II"/>
  </xs:restriction>
</xs:simpleType>
```

```
<xs:simpleType name="PolarClassContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="PC1"/>
    <xs:enumeration value="PC2"/>
    <xs:enumeration value="PC3"/>
    <xs:enumeration value="PC4"/>
    <xs:enumeration value="PC5"/>
    <xs:enumeration value="PC6"/>
    <xs:enumeration value="PC7"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="IceClassType">
  <xs:sequence>
    <xs:element name="BalticIceClass"
                type="epc:IceClassBalticContentType" minOccurs="0"/>
    <xs:element name="PolarClass"
                type="epc: epc:PolarClassContentType" minOccurs="0"/>
      <xs:element name="Comment" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The ice class can contain zero or more elements from the following list. If zero elements exist, the ship has no ice class. If only the comment field exists, the ship may have another class that is not one of the described ones.

— BalticIceClass: This the ice class as defined in SJÖFS 2003:4 and which is used by Finland and Sweden in the Baltic region.

— PolarClass: This is the polar class as defined in MSC 1056. This coding is also sometimes called the IACS ice class.

— Comment: Additional information or other ice class than the ones listed above.

7.8.6 epc:LengthOverallType – Length overall

Description:

Length overall, i.e. maximum length of a vessel from the two points on the hull most distant from each other, measured perpendicular to the waterline.

Type:

```
<xs:simpleType name="LengthOverallType">
  <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
Length overall, measured in metres.

7.8.7 epc:NetTonnageType – Net tonnage

Description:
This is the net tonnage as defined by The International Convention on Tonnage Measurement of Ships.

Type:

```
<xs:simpleType name="NetTonnageType">
  <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
The ship's net tonnage as defined in the Convention.

7.8.8 epc:SummerDraughtType– Summer draught

Description:
Worst-case loaded draught for the ship.

Type:
```
<xs:simpleType name="SummerDraughtType">
  <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
The element shall contain the ship's summer draught in metres.

7.8.9 epc:ShipTypeContentType – Ship type code

Description:
This is an enumerated type containing ship type codes according to UNECE R28.

Type:
```
<xs:simpleType name="ShipTypeContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
This data type codes the ship type according to UNECE R28. Examples of codes for ship types are listed in Annex J. The actual codes shall be taken from and constructed according to the above reference. The code is a two- or three-digit number without any inserted space.

7.9 Vessel operation data types

7.9.1 epc:AirDraughtType – Air draught

Description:
Distance from waterline to highest point of vessel under the current loading conditions.

Type:
```
<xs:simpleType name="AirDraughtType">
  <xs:restriction base="epc:decimal"/>
</xs:simpleType>
```

Representation:
Data is the ship's air draught in metres.

7.9.2 epc:ArrivalDraughtType – Arrival draught

Description:
Draught of ship at arrival (before loading or unloading).

Type:
```
<xs:complexType name="ArrivalDraughtType">
  <xs:sequence>
    <xs:element name="ForeDraught" type="epc:decimal" minOccurs="0"/>
    <xs:element name="MidShipDraught" type="epc:decimal" minOccurs="0"/>
    <xs:element name="AftDraught" type="epc:decimal" minOccurs="0"/>
```

```
    </xs:sequence>
  </xs:complexType>
```

Representation:
The data fields contain the ship's draught at arrival in metres. It is possible to specify fore, aft and mid-ship draughts. If only one is specified, it should normally be mid-ship draught.

7.9.3 epc:ArrivalDepartureType – Arrival or departure flag

Description:
Flag distinguishing between an arrival or departure message.

Type:

```
<xs:simpleType name="ArrivalDepartureType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="Arrival"/>
    <xs:enumeration value="Departure"/>
    <xs:enumeration value="Other"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The item shall contain the code as defined here. It is mandatory for the sender to use correct coding if the data item is required in the message. If it is not required, it can usually be omitted if the message is neither arrival nor departure.

NOTE In cases where the only legal choices are arrival or departure, the receiver can only check on one of the values and assume the other if the first check does not give a match.

7.9.4 epc:ATAType – Actual time of arrival

Description:
Actual time of arrival.

Type:

```
<xs:simpleType name="ATAType">
  <xs:restriction base="epc:dateTime"/>
</xs:simpleType>
```

Representation:
This is the actual time and date of arrival. Note that local time offset from UTC is required.

7.9.5 epc:ATDType – Actual time of departure

Description:
Actual time of departure.

Type:

```
<xs:simpleType name="ATDType">
  <xs:restriction base="epc:dateTime"/>
</xs:simpleType>
```

Representation:
This is the actual time and date of departure. Note that local time offset from UTC is required.

7.9.6 epc:ATPType – Actual time of passage

Description:
Actual time of passage referenced to a specific location.

Type:

```
<xs:simpleType name="ATPType">
  <xs:restriction base="epc:dateTime"/>
</xs:simpleType>
```

Representation:
This is the actual time and date of passage. Note that local time offset from UTC is required.

7.9.7 epc:BulkLoadUnloadDataType – Data required for safe loading and unloading

Description:
This data type contains information that is specified as transferred between the ship's master and terminal before loading or unloading a bulk carrier (as described in the BLU). The data item does not cover information covered in other data items in this part of ISO 28005, like ship identity, length overall, beam, etc.

Type:

```
<xs:complexType name="BulkCargoPartType">
  <xs:sequence>
    <xs:element name="Hatch" type="epc:string" />
    <xs:element name="Quantity" type="epc:MeasureType" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="BulkCargoListType">
  <xs:sequence>
    <xs:element name="Unit" type="epc:BulkCargoPartType"
                maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="BulkLoadUnloadDataType">
  <xs:sequence>
    <xs:element name="IsLoading" type="epc:boolean" />
    <xs:element name="CargoType" type="epc:string" />
    <xs:element name="TotalQuantity" type="epc:BulkCargoListType" />
    <xs:element name="OperationPlan" type="epc:BulkCargoListType"
                maxOccurs="unbounded"/>
    <xs:element name="TimeForBallasting" type="epc:duration" />
    <xs:element name="LengthOfCargoArea" type="epc:decimal" />
    <xs:element name="DistanceWaterlineToHatch" type="epc:decimal" />
    <xs:element name="DistanceSideToHatch" type="epc:decimal" />
    <xs:element name="AccommodationLadder" type="epc:string" />
    <xs:element name="CargoHandlingGear" type="epc:string" />
    <xs:element name="MooringLines" type="epc:string" />
    <xs:element name="SpecificInstructions" type="epc:string" />
    <xs:element name="RequiredRepairs" type="epc:string" />
    <xs:element name="ChecklistCompleted" type="epc:boolean" />
    <xs:element name="Remarks" type="epc:string" />
  </xs:sequence>
</xs:complexType>
```

Representation:
This data structure contains various information elements required by IMO A.862 (BLU), Annex II and suggested in MSC 1160, Annex I. The data elements are as follows.

— IsLoading: True if ship is loading, false if ship is unloading.

— CargoType: Brief description of cargo.

— TotalQuantity: Total quantity of cargo, stowage by hatch.

— OperationPlan: Quantity of cargo to be loaded or unloaded per stage, in quantity per hatch. First stage as first element of each list. A number of lists can be inserted in the message, in which case all lists shall be processed in parallel. If the quantity in one unit is zero, it means that one shall wait until all corresponding units in all lists have been completed.

— TimeForBallasting: Time needed for ballasting or de-ballasting.

— LengthOfCargoArea: Length of the cargo area (“working length”) from the forward coaming of the forward-most hatch to the after coaming of the aft-most hatch into which cargo is to be loaded or from which cargo is to be unloaded.

— DistanceWaterlineToHatch: Distance from the waterline to the first hatch to be loaded or unloaded.

— DistanceSideToHatch: Distance from the ship's side to the hatch opening.

— AccommodationLadder: Free text description of accommodation ladder position, if provided.

EXAMPLE If shore gangway is provided, can ship provide secure landing place, safety net and bulwark ladder?

— CargoHandlingGear: Details and capacities of ship's cargo-handling gear, if any.

— MooringLines: Number and type of mooring lines. Number of enclosed fairleads forward and aft.

— SpecificInstructions: Specific requests, such as for trimming or continuous measurement of the water content of the cargo.

— RequiredRepairs: Details of any necessary repairs which may delay berthing, the commencement of loading or unloading, or the ship sailing on completion of loading or unloading.

— ChecklistCompleted: True if the terminal's checklist has been completed and all entries check out positive. If false, give explanations in “Remarks” field.

— Remarks: Any other information related to the ship requested by the terminal.

7.9.8 epc:CallPurpose – Purpose of call

Description:
This is a data type with coded content specifying the purpose of a ship's port call.

Type:

```
<xs:simpleType name="PurposeOfCallContentType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>

<xs:complexType name="CallPurpose">
  <xs:sequence>
    <xs:element name="CallPurposeCode" type="epc:PurposeOfCallContentType"
                minOccurs="0"/>
    <xs:element name="CallPurposeText" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This data element shall contain the purpose of the call as a textual description and/or coded value. The coded value can only be omitted if the purpose of the call does not match any of the defined codes. The coded value shall be according to the definition in UN Directories definitions UNTDD for code element 8025, conveyance call purpose description code. A list of purpose of call codes is given in Annex K. The textual description is free format to be read by humans.

7.9.9 epc:DepartureDraughtType – Departure draught

Description:
Draught of ship at departure (after loading or unloading).

Type:

```
<xs:complexType name="DepartureDraughtType">
  <xs:sequence>
    <xs:element name="ForeDraught" type="epc:decimal" minOccurs="0"/>
    <xs:element name="MidShipDraught" type="epc:decimal" minOccurs="0"/>
    <xs:element name="AftDraught" type="epc:decimal" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The data fields contain the ship's draught at departure in metres. It is possible to specify fore, aft and mid-ship draughts. If only one is specified, it should normally be mid-ship draught.

7.9.10 epc:EntryPositionType – Time and position for entry to ship reporting

Description:
This data item contains date and position for entry into a ship reporting or other area.

Type:

```
<xs:complexType name="EntryPositionType">
  <xs:sequence>
    <xs:element name="Position" type="epc:Position"/>
    <xs:element name="Time" type="epc:dateTime"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The position and time when the ship is expected to enter a ship reporting or other area.

7.9.11 epc:ETAType – Estimated time of arrival

Description:
Estimated time of arrival, relative to a specified port.

Type:

```
<xs:simpleType name="ETAType">
  <xs:restriction base="epc:dateTime"/>
</xs:simpleType>
```

Representation:
This is the estimated time and date of arrival. Note that local time offset from UTC is required.

A number of different estimated arrival times may exist simultaneously, e.g., as information from management to master, from master to port or as an internal port generated arrival estimate. The ship may also be instructed to send new estimates, e.g., 72, 48 and 24 hours prior to the expected arrival. This data type is intended for transmission of one estimate in a message that will define the context for the estimate. A data storage system may need to differentiate between estimates received in different messages.

7.9.12 epc:ETDType – Estimated time of departure

Description:
Estimated time of departure, relative to a specified port.

Type:

```
<xs:simpleType name="ETDType">
  <xs:restriction base="epc:dateTime"/>
</xs:simpleType>
```

Representation:
This is the estimated time and date of departure. Note that local time offset from UTC is required.

A number of different estimated departure times may exist simultaneously, e.g., as information from management to master, from master to port or as an internal port generated departure estimate. This data type is intended for transmission of one estimate in a message that will define the context for the estimate. A data storage system may need to differentiate between estimates received in different messages.

7.9.13 epc:ETPType – Estimated time of passage

Description:
Estimated time of passage referenced to a specific location.

Type:

```
<xs:simpleType name="ETPType">
  <xs:restriction base="epc:dateTime"/>
</xs:simpleType>
```

Representation:
This is the estimated time and date of passage. Note that local time offset from UTC is required.

A number of different estimated passage times may exist simultaneously, e.g., as information from management to master, from master to ship reporting system or as an internal coast state generated passage estimate. This data type is intended for transmission of one estimate in a message that will define the context for the estimate. A data storage system may need to differentiate between estimates received in different messages.

7.9.14 epc:ExitPositionType – Time and position for exit from ship reporting

Description:
This data item contains date and position for exit from a ship reporting or other area.

Type:

```
<xs:complexType name="ExitPositionType">
  <xs:sequence>
    <xs:element name="Position" type="epc:Position"/>
    <xs:element name="Time" type="epc:dateTime"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
The position and time when the ship is expected to exit a ship reporting or other area.

7.9.15 epc:LastPortOfCallType – Last port of call

Description:
When referring to a specific leg of a voyage, the last port of call is the last port visited before the leg's departure port. When referring to a port stay, the last port of call is the departure port for the last leg leading to this port.

Type:

```
<xs:complexType name="LastPortOfCallType">
  <xs:complexContent>
    <xs:extension="epc:PortType"/>
```

```
  </xs:complexContent>
</xs:complexType>
```

Representation:
This is a normal port data item.

7.9.16 epc:LocationType – Identification of a location

Definition:
This data type identifies a location, which can be a port, a named location and/or a geographic position. This is normally the location from which a report is given.

Type:

```
<xs:complexType name="LocationType">
  <xs:sequence>
    <xs:element name="Port" type="epc:PortType" minOccurs="0"/>
    <xs:element name="Position" type="epc:PositionType" minOccurs="0"/>
    <xs:element name="Name" type="epc:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This data type allows the user to specify a location as a port, a geographic position and/or a named location. At least one field shall be used. Name is normally not useful together with a port data element.

7.9.17 epc:NavigationalStatusContentsType – Navigational status

Description:
This data type contains a coded representation of the ship's navigational status.

Type:

```
<xs:simpleType name="NavigationalStatusContentType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="Underway by engines"/>
    <xs:enumeration value="At anchor"/>
    <xs:enumeration value="Not under command"/>
    <xs:enumeration value="Restricted in ability to manoeuvre"/>
    <xs:enumeration value="Moored"/>
    <xs:enumeration value="Constrained by draught"/>
    <xs:enumeration value="Aground"/>
    <xs:enumeration value="Engaged in fishing"/>
    <xs:enumeration value="Underway by sail"/>
  </xs:restriction>
</xs:simpleType>
```

Representation:
The coding corresponds to navigational status as defined by COLREG.

7.9.18 epc:NextPortOfCallType – Next port of call

Description:
When referring to a specific leg of a voyage, the next port of call is the next port to be visited after the leg's arrival port. When referring to a port stay, the next port of call is the arrival port for the next leg leading from this port.

Type:

```
<xs:complexType name="NextPortOfCallType">
   <xs:complexContent>
      <xs:extension base="epc:PortType"/>
```

```
      </xs:complexContent>
   </xs:complexType>
```

Representation:
This is a normal port data item.

7.9.19 epc:NextReportTimeType – Time of next report

Description:
This is the time when the receiver can expect the next report. Context is given by the type of report the data item is embedded in.

Type:

```
   <xs:simpleType name="NextReportTimeType">
      <xs:restriction base="epc:dateTime"/>
   </xs:simpleType>
```

Representation:
Time and date, including UTC offset.

7.9.20 epc:OBOLoadUnloadDataType – Data required for safe loading and unloading of OBO

Description:
This data type contains additional information that is specified as transferred between ship's master and terminal before loading or unloading an OBO carrier as described in IMO A.862 (BLU).

Type:

```
   <xs:complexType name="OBOLoadUnloadDataType">
     <xs:sequence>
       <xs:element name="PrecedingCargo1" type="epc:string" />
       <xs:element name="PrecedingCargo2" type="epc:string" />
       <xs:element name="PrecedingCargo3" type="epc:string" />
       <xs:element name="LastOilCargoPort" type="epc:PortType" />
       <xs:element name="LastOilCargoDate" type="epc:date" />
       <xs:element name="SlopTankStatus" type="epc:string" />
       <xs:element name="GasFreeCertificate" type="epc:CertificateType" />
     </xs:sequence>
   </xs:complexType>
```

Representation:
This data structure contains various information elements required by IMO A.862 (BLU), Annex II, which, specifically relate to OBO carriers. The data elements are as follows.

— PrecedingCargo[123]: Nature of preceding three cargos (1 is most recent).

— LastOilCargo[Port,Date]: Date and place where last oil cargo was discharged.

— SlopTankStatus: Advice as to content of slop tanks and whether fully inerted and sealed.

— GasFreeCertificate: Date, place and name of authority that issued the last gas-free certificate which includes pipelines and pumps.

7.9.21 epc:PeriodOfStayType – Period of stay

Description:
This can be used as an alternative to specifying both arrival and departure times for a port call.

Type:

```
<xs:simpleType name="PeriodOfStayType">
  <xs:restriction base="epc:duration"/>
</xs:simpleType>
```

Representation:
Duration of a port stay according to standard coding rules.

7.9.22 epc:PortOfArrivalType – Arrival port

Description:
When referring to a voyage leg, this is the port at the end of that leg. This is normally the case when this element is used in prearrival notifications. In other contexts, the element needs additional context definitions.

Type:

```
<xs:complexType name="PortOfArrivalType">
   <xs:complexContent>
      <xs:extension base="epc:PortType"/>
   </xs:complexContent>
</xs:complexType>
```

Representation:
A port definition according to standard coding rules.

7.9.23 epc:PortOfDepartureType – Departure port

Description:
When referring to a leg of a voyage, this is the departure port for that leg. When referring to a port stay, it is the departure port of the leg that led to this port.

Type:

```
<xs:complexType name="PortOfDepartureType">
   <xs:complexContent>
      <xs:extension base="epc:PortType"/>
   </xs:complexContent>
</xs:complexType>
```

Representation:
A port definition according to standard coding rules.

7.9.24 epc:RadiocommunicationsType – Radiocommunication active

Description:
Specifying frequencies and/or stations actively listened to and used.

Type:

```
<xs:simpleType name="RadioCommunicationsType">
  <xs:restriction base="epc:string"/>
</xs:simpleType>
```

Representation:
State in full names of stations/frequencies guarded.

7.9.25 epc:ROBBunkersType – Bunkers remaining onboard

Description:
Quantity of bunkers remaining onboard (ROB).

Type:

```
<xs:complexType name="ROBBunkersType ">
  <xs:sequence>
    <xs:element name="HFO" type="decimal" minOccurs="0"/>
    <xs:element name="HFOLS" type="decimal" minOccurs="0"/>
    <xs:element name="MDO" type="decimal" minOccurs="0"/>
    <xs:element name="MDOLS" type="decimal" minOccurs="0"/>
    <xs:element name="MGO" type="decimal" minOccurs="0"/>
    <xs:element name="MGOLS" type="decimal" minOccurs="0"/>
    <xs:element name="Other" type="decimal" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

Representation:
This data type allows the sender to specify remaining bunker oil onboard, in one or more of the following categories.

— HFO (HFOLS): Heavy Fuel Oil (Low Sulphur ditto)

— MDO (MDOLS): Marine Diesel Oil (Low Sulphur ditto)

— MGO (MGOLS): Marine Gas Oil (Low Sulphur ditto)

— Other: Any other type of oil

All measurements shall be in metric tonnes. Low Sulphur means oil with less than 1,5 % sulphur as defined in regulation 14(4)(a) of Annex VI of MARPOL.

7.9.26 epc:ShipDefectsType – Any defects of important ship equipment

Description:
This type is used to report problems that could cause significantly reduced manoeuvrability.

Type:

```
<xs:complexType name="ShipDefectsType">
  <xs:sequence>
    <xs:element name="HullIntegrity" type="epc:string" minOccurs="0" />
    <xs:element name="Manoeuvrability" type="epc:string" minOccurs="0" />
    <xs:element name="Mooring" type="epc:string" minOccurs="0" />
    <xs:element name="CargoHandling" type="epc:string" minOccurs="0" />
    <xs:element name="Communication" type="epc:string" minOccurs="0" />
    <xs:element name="Navigation" type="epc:string" minOccurs="0" />
    <xs:element name="Other" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
This data item allows a ship to report various conditions that may impair its ability to operate as expected. The categories are as follows.

— HullIntegrity: Any problems with hull or superstructure that may cause operational problems.

— Manoeuvrability: Defects in hull, steering or propulsion systems that affect manoeuvrability.

— Mooring: Anchor or mooring systems problems.

— CargoHandling: Problems that may impact loading or unloading performance.

— Communication: Problems in communication systems.

— Navigation: Problems with bridge and/or navigation systems.

— Other: Other systems.

7.9.27 epc: ShipStatusType – Vessel status information

Description:
This data item gives vessel navigational status during a voyage. This data element is mainly intended for reporting relative to IMO A.851.

Type:

```
<xs:complexType name="ShipStatusType">
  <xs:sequence>
    <xs:element name="Course" type="epc:decimal" />
    <xs:element name="Speed" type="epc:decimal" />
    <xs:element name="PilotOnboard" type="epc:boolean" />
    <xs:element name="NavigationalStatus"
                type="epc:NavigationalStatusContentType" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
This data item contains elements that describe a vessel's navigational status during a voyage. The elements are as follows.

— Course: True course as decimal degree angle in the range 0 (zero) to 360, inclusive.

— Speed: Speed over ground in decimal knots.

— PilotOnboard: True if a pilot is onboard, false otherwise.

— NavigationalStatus: Optional code specifying the ship's navigational status according to COLREG.

7.9.28 epc: VoyageNumberType – Voyage identification code

Description:
This is an operator-assigned reference code for one particular voyage.

Type:

```
<xs:simpleType name="VoyageNumberType">
  <xs:restriction base="epc:token"/>
</xs:simpleType>
```

Representation:
The number, or code, shall conform to the token data type and shall be unique for the ship in question. It is recommended that a voyage be defined so that the same port is never visited more than once on the voyage.

NOTE This code is normally used by a ship to identify a voyage between ports. The port normally uses the JournalNumber (see 7.7.1) to identify a given port call by the ship.

7.9.29 epc: VoyageDescriptionType – Brief description of voyage

Description:
This is a description of the voyage as required in FAL 1. It lists all ports called on or to be called on in the current voyage and states if cargo was loaded or discharged in the port.

Type:

```
<xs:complexType name="VoyageDescriptionItemType" >
```

```
  <xs:sequence>
    <xs:element name="Port" type="epc:PortType" />
    <xs:element name="ETA" type="epc:ETAType" />
    <xs:element name="Load" type="epc:string" minOccurs="0" />
    <xs:element name="Unload" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="VoyageDescriptionType">
  <xs:sequence>
    <xs:element name="PortCall" type="epc:VoyageDescriptionItemType"
                minOccurs="0" maxOccurs="unbounded" >
  </xs:sequence>
</xs:complexType>
```

Representation:
It is required that each port call in a voyage be listed with ETA, what cargo was loaded and what cargo was unloaded. The cargo descriptions are free format to be read by humans. The loaded or unloaded cargo fields should be omitted or empty if no loading and/or unloading took place in a particular port.

For simplicity, this description should remain unchanged throughout the voyage and list planned activities as stated. However, if cargo loading and discharge plans change, the description shall also be changed.

The FAL 1 form requires that it should be underlined where remaining cargo will be discharged, but that it should be implicit in this data structure. Note also that the contents of this field should make the “Brief description of cargo” superfluous.

7.9.30 epc:WayPointListType – Way-point list

Description:
This is a list of way-points as positions, possibly specifying a part of a voyage leg. One will normally have to specify a starting point and possibly an end point as a location in addition to the way-point list.

Type:

```
<xs:simpleType name="TrackContentsType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="RL"/>
    <xs:enumeration value="GC"/>
    <xs:enumeration value="CO"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="WayPointType">
  <xs:sequence>
    <xs:element name="Position" type="epc:PositionType" />
    <xs:element name="Track" type="epc:TrackContentType" />
    <xs:element name="Time" type="epc:dateTime" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="WayPointListType">
  <xs:sequence>
    <xs:element name="WayPoint" type="epc:WayPointType"
                minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
</xs:complexType>
```

Representation:
This is a list of positions and times in increasing time order (earliest time first) defining a ship's trajectory between the specified positions. Position and time shall be specified according to defined rules. The track type applies to the track of the specified position and can be a rhumb line (RL), a great circle line (GC) or a costal transit (CO) where the ship is kept along a coast at a minimum distance and otherwise at a minimum distance rhumb line.

7.9.31 epc:WeatherObservationsType – Weather information as observed

Description:
This data item can be used to describe the current weather observation. This is based on observations and manual assessments.

Type:
```
<xs:complexType name="WeatherInformationType">
  <xs:sequence>
    <xs:element name="Wind" type="epc:int" minOccurs="0" />
    <xs:element name="WindDirection" type="epc:int" minOccurs="0" />
    <xs:element name="SeaState" type="epc:int" minOccurs="0" />
    <xs:element name="SeaStateDirection" type="epc:int" minOccurs="0" />
    <xs:element name="Swell" type="epc:int" minOccurs="0" />
    <xs:element name="SwellDirection" type="epc:int" minOccurs="0" />
    <xs:element name="Remarks" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```
Representation:
All fields are optional, but if any of the first six elements are empty, the remarks field should be used to give further descriptions, as follows.

— Wind: Wind strength in Beaufort scale, from zero (0) to 17, inclusive.

— WindDirection: Direction in true degrees, zero (0) to 360, inclusive.

— SeaState: Sea state in World Metrological Organization (WMO) code, zero (0) to 9, inclusive.

— SeaStateDirection: Direction in true degrees, zero (0) to 360, inclusive.

— Swell: Swell in Douglas Scale, zero (0) to 9, inclusive.

— SwellDirection: Direction in true degrees, zero (0) to 360, inclusive.

— Remarks: Alternative free text description.

7.10 Waste and environmental data types

7.10.1 epc:BallastStatusType – Status of ship's ballast water when in port

Description:
This data item describes the status of the ship's ballast water when reaching port.

Type:
```
<xs:complexType name="BallastStatusType">
  <xs:sequence>
    <xs:element name="IsClean" type="epc:boolean" />
    <xs:element name="Remarks" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>
```

Representation:
The IsClean flag shall be true if the ballast tanks only contain clean water (as per port or terminal regulations). The Remarks field shall be used to explain any discrepancies if the flag is false.

7.10.2 epc:WasteDisposalRequirementsType – Ship's requirements for waste disposal

Description:
This data item is a free text description of the ship's requirements for waste and residue disposal.

Type:

```
<xs:simpleType name="WasteDisposalRequirementsType">
  <xs:restriction base="epc:string"/>
</xs:simpleType>
```

Representation:
This is a free text description of a ship's requirements for waste and residue disposal at arrival port. This is a recent addition to FAL 1.

NOTE When the WasteDisposalInformation data is supplied, this field is in principle superfluous. However, authorities can still require it.

7.10.3 epc: WasteInformationType – Waste information

Description:
This data element contains information that shall be sent to a port in conjunction with an arrival as specified by MEPC 644. The transmission of this data is required by EU Directive 2000/59/EC for ships visiting European ports.

NOTE 1 The current FAL convention does not mandate the transmission of this information set. It only requires a general report on requirements for safe waste disposal.

Type:

```
<xs:complexType name="WasteTypeType">
  <xs:sequence>
    <xs:element name="Code" type="epc:token"/>
    <xs:element name="Description" type="epc:string" minOccurs="0" />
  </xs:sequence>
</xs:complexType>

<xs:complexType name="WasteDisposalInformationType">
  <xs:sequence>
    <xs:element name="WasteType type="epc:WasteTypeType" />
    <xs:element name="ToBeDelivered" type="epc:decimal" />
    <xs:element name="MaxStorage" type="epc:decimal" />
    <xs:element name="RetainedOnboard" type="epc:decimal" />
    <xs:element name="EstimateGenerated" type="epc:decimal" />
    <xs:element name="DisposedOfInPort" type="epc:PortType" minOccurs="0" />
  </xs:sequence>
</xs:complexType>

<xs:simpleType name="WasteDeliveryStatusType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="All"/>
    <xs:enumeration value="Some"/>
    <xs:enumeration value="None"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="WasteInformationType">
```

```
    <xs:sequence>
      <xs:element name="PointOfContact" type="epc:ContactInfoType" />
      <xs:element name="WasteDeliveryStatus"
                  type="epc:WasteDeliveryStatusType" />
      <xs:element name="LastPortDelivered" type="epc:PortType"/>
      <xs:element name="LastPortDeliveredDate" type="epc:date"/>
      <xs:element name="WasteDisposalInformation"
                  type="epc:WasteDisposalInformationType"
                  maxOccurs="unbounded"/>
      <xs:element name="Comment" type="epc:string"/>
    </xs:sequence>
  </xs:complexType>
```

Representation:
The information regarding waste is represented as follows.

— PointOfContact: Point of contact (POC) in arrival terminal or port.

— WasteDeliveryStatus: If ship delivers all, some or none of its waste in the port it reports to.

— LastPortDelivered[Date]: Last port and date when ship-generated waste was delivered.

— WasteDisposalInformation: One entry per type of waste the ship has onboard. Each entry shall contain:

  — WasteType: Type of waste. The code shall be the one defined in Annex D. In addition, the proper shipping name is required for codes 504 (cargo residues) and all types of waste in category 2 (NLS). Otherwise, the text description of waste is optional.

  — ToBeDelivered: Quantity in cubic metres (m^3) of waste to be delivered in port. This can be an estimate.

  — MaxStorage: Maximum dedicated storage capacity for this type of waste in cubic metres (m^3).

  — RetainedOnboard: Quantity in cubic metres (m^3) of waste to be retained onboard.

  — EstimateGenerated: Estimate amount of waste to be generated between notification and next port of call in cubic metres (m^3).

  — DisposedOfInPort: Name of port where remaining waste will be disposed of.

— Comment: Additional information.

NOTE 2 The structure of information is not the same as given in MEPC 644, but all information elements are present. In particular, only one waste list is provided, which contains both waste to be delivered and waste kept onboard.

8 Electronic representation of this part of ISO 28005

8.1 Main XML schema file

All data definitions in this part of ISO 28005 can be concatenated into one valid XML schema file by adding a suitable header and footer to the definitions. The header and footer can be as follows:

```
<?xml version="1.0" ?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
           xmlns:epc="http://www.iso.org/28005-2"
     targetNamespace="http://www.iso.org/28005-2">

  <xs:simpleType ...
```

```
  <xs:simpleType ...
  <xs:complexType ...

</xs:schema>
```

Note that the first line may also include information about character encoding. Without any particular encoding attribute, the XML parser is required to understand UTF-8 and UTF-16[15]. For other encodings, one can insert the appropriate attribute, e.g.:

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
```

8.2 Code set specification schema

Code sets that are not included in the main schema file are represented as external XML files. Thus, it is not automatically possible to validate EPC message files against the EPC schema file. The code set specification file shall be constructed according to the following schema.

```
<?xml version="1.0" ?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:complexType name="EPCCodeValueType">
    <xs:sequence>
      <xs:element name="Code" type="xs:token"/>
      <xs:element name="Description" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>

  <xs:complexType name="EPCCodeSetList">
    <xs:sequence>
      <xs:element name="EPCCodeValue" type="EPCCodeValueType"
                  minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>

  <xs:element name="CodeSetName" type="xs:string">
  <xs:element name="CodeSetReference" type="xs:string">
  <xs:element name="CodeSet" type="EPCCodeSetList">

</xs:schema>
```

The CodeSetName shall be the name of the code set as specified in the annex title or by other normative references. The CodeSetReference shall be the description of where this particular code set has its origin, with reference to the normative specification where appropriate. The CodeSet is the actual code set.

Annex A
(informative)

Certificate codes

Table A.1 gives code values that are used to identify a specific certificate type. The list is based on MSC 1151. Refer to MSC 1151 for the use of these certificates and accurate references to where they are mandated. The following list is normative only for certificate codes and tag names.

Table A.1 — Code values based on MSC 1151

Code	Tag name	Description
ITC	TonnageCertificate	International Tonnage (Measurement) Certificate
LLC	LoadLineCertificate	International Load Line Certificate
MSM	MinimumSafeManningDocument	Minimum Safe Manning Document
IOPP	OilPollutionPreventionCertificate	International Oil Pollution Prevention Certificate
ISPP	SewagePollutionPreventionCertificate	International Sewage Pollution Prevention Certificate
VDR	VDRComplianceCertificate	Voyage Data Recorder System Certificate of Compliance
ISMC	ISMComplianceDocument	ISM Document of Compliance
SMC	SafetyManagementCertificate	Safety Management Certificate (ISM Code)
ISSC	ISSCertificate	International Ship Security Certificate (ISSC)
PSSC	PSSCertificate	Passenger Ship Safety Certificate
STPSSaC	STPSSaCertificate	Special Trade Passenger Ship Safety Certificate
STPSSpC	STPSSpCertificate	Special Trade Passenger Ship Space Certificate
SCC	CSSConstructionCertificate	Cargo Ship Safety Construction Certificate
SEC	CSSEquipmentCertificate	Cargo Ship Safety Equipment Certificate
SRC	CSSRadioCertificate	Cargo Ship Safety Radio Certificate
SSC	CSSCertificate	Cargo Ship Safety Certificate
GAD	GrainAuthorizationDocument	Document of Authorization for the Carriage of Grain
CLC	CivilLiabilityCertificate	Certificate of Insurance in Respect of Civil Liability for Oil Pollution Damage
ESD	EnhancedSurveyDocument	Enhanced Survey Report File (Bulk and Tankers)
NLS	NLSCertificate	International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (NLS Certificate)
BCHC	BulkChemicalsCarriageCertificate	Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk
IBCHC	IntBulkChemicalsCarriageCertificate	International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk
LGCC	BulkLiquidGasCertificate	Certificate of Fitness for the Carriage of Liquefied Gases in Bulk
ILGCC	IntBulkLiquidGasCertificate	International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk
HSCS	HSCSafetyCertificate	High-Speed Craft Safety Certificate
HSCOP	HSCOperationPermit	Permit to Operate High-Speed Craft
IMDG	IMDGCertificate	Certificate of Compliance for Carriage of Dangerous Goods
INFC	INFCertificate	International Certificate of Fitness for the Carriage of INF Cargo

Table A.2 gives additional codes that are not based on MSC 1151. Code and tag name fields are normative.

Table A.2 — Code values not based on MSC 1151

Code	Tag name	Description
COR	RegistryCertificate	COR
CLCH	HullClassCertificate	CLCH
CLCM	EngineClassCertificate	CLCM
PANDI	PandiCertificate	PANDI
ILO133	ILO133Certificate	ILO133
ILO92	ILO92Certificate	ILO92
ITF	ITFBlueCard	ITF
DOH	DeclarationOfHealth	DOH
GFC	GasFreeCertificate	GFC
DRC	DeRatCertificate	DRC
OTH	Certificate	OTH

Annex B
(informative)

Classification society codes

Table B.1 gives code values that are used to identify specific classification societies. This list is adapted from The Lloyd's Register Fairplay database two-letter codes for classification societies.

Table B.1 — Code values adapted from the Lloyd's Register

Code	Class society
BR	Bulgarian Koraben Registar
BV	Bureau Veritas
CC	China Classification Society
CR	China Register
CS	Croatian Register of Shipping
DS	Deutsche Schiffs-Revision
GL	Germanische Lloyd
HR	Hellenic Register
IR	Indian Register of Shipping
JR	Jugoslavenski Register Brodova
KI	Biro Klasifikasi Indonesia
KR	Korean Register of Shipping
LR	Lloyd's Register
NK	Nippon Kaiji Kyokai
NV	Det Norske Veritas
PR	Polski Rejestr Statkow
RC	Registro Cubana de Buques
RI	Registro Italiano Navale
RN	Registrul Naval Roman
RP	Rinave Portuguesa
RR	Russian River Register
RS	Russian Maritime Register
TL	Turk Lloydu
VE	Venus Register
VR	Vietnam Register
ZC	China Classification Society
OT	Other

Annex C
(informative)

Onboard and shore duty codes

Table C.1 gives codes for onboard (and shore) duty. The codes and the left-most descriptions are mainly taken from the corresponding list used by the United States Coast Guard (USCG) & Customs and Border Protection (CBP) Electronic Notice of Arrival/Departure (e-NOA/D). However, additional descriptions and entries marked with “Other” in the reference column were not in that original list.

Table C.1 — Onboard and shore duty codes

Code	Description	Reference
AbleSeaman	Able Seaman	
Agent	Agent	
AsstFoodBevMngr	Assitant Food and Beverage Manager	
BarManager	Bar Manager	
BarService	Bar Service	
Bosun	Bosun	
Cadet	Cadet	
Captain	Captain	
CargoTechnician	Cargo Technician	
CasinoStaff	Casino Staff	
ChiefCook	Chief Cook	
ChiefElectrician	Chief Electrician	
ChiefHousekeeper	Chief Housekeeper	
ChiefEngineer	Chief Engineer	Other
ChiefMaster	Chief Master	
ChiefMate	Chief Mate	
ChiefOfficer	Chief Officer	
ChiefPurser	Chief Purser	
ChiefSteward	Chief Steward	
ClassSurveyor	Class Surveyor	Other
CSO	Company Security Officer	
Cook	Cook	
CraneOperator	Crane Operator	
CrewMember	Crew Member	
CruiseDirector	Cruise Director	
CruiseStaff	Cruise Staff	
DeckApprentice	Deck Apprentice	Other

Table C.1 (*continued*)

Code	Description	Reference
DeckFitter	Deck Fitter	Other
DeckOfficer	Deck Officer	
Deckhand	Deckhand, Deck Crew	
Doctor	Doctor	
Donkeyman	Donkeyman	
ElectricalEngineer	Electrical Engineer	
ElectricalOfficer	Electrical Officer	Other
Electrician	Electrician	
EngineerCadet	Engineer Cadet, Engine Apprentice	
EngineeringCrew	Engineering Crew, Engine Crew	
EngineFitter	Engine Fitter	Other
Entertainment	Entertainment	
FacilitiesCrew	Facilities Crew	
FacilitiesManager	Facilities Manager	
FirstAsstEngineer	First Assistant Engineer	
FirstEngineer	First Engineer	Other
FirstMate	First Mate	
FirstOfficer	First Officer	
Fitter	Fitter	
FourthOfficer	Fourth Officer	
FoodBevMngr	Food and Beverage Manager, Catering Officer	
FoodService	Food Service, Catering Crew	
FourthAsstEngineer	Fourth Assistant Engineer, Fourth Engineer	
Greaser	Greaser	
Hospitality	Hospitality	
HotelDirector	Hotel Director	
HotelStaff	Hotel Staff	
HousekeepingStaff	Housekeeping Staff	
InformationTechnology	Information Technology	
JuniorEngineer	Junior Engineer	Other
LaundryMaster	Laundry Master	
Lifeboatman	Lifeboatman	
Maitred	Maître d'	
MarineCrew	Marine Crew	
MarketingRevenueMngr	Marketing Revenue Manager	
Master	Master	

Table C.1 (*continued*)

Code	Description	Reference
MasterFirstClassPilot	Master First Class Pilot	
MateFirstClassPilot	Mate First Class Pilot	
Mechanic	Mechanic	
MedicalStaff	Medical Staff	
Messman	Messman	
Motorman	Motorman	
Oiler	Oiler	
Operator	Operator	
OrdinarySeaman	Ordinary Seaman	
Owner	Owner	
Painter	Painter	
Porter	Porter	
Provision	Provision	
ProvisionMaster	Provision Master	
Pumpman	Pumpman, Pump Man	
QMED	QMED	
RadioOfficer	Radio Officer	
Reeferman	Reeferman	
Repairman	Repairman	Other
RiddingCrew	Ridding Crew	Other
SafetyAndSecurity	Safety and Security	
SecondAsstEngineer	Second Assistant Engineer, Second Engineer	
SecondMate	Second Mate	
SecondOfficer	Second Officer	
SSO	Ship Security Officer	
StaffCaptain	Staff Captain	
Steward	Steward	
Superintendent	Superintendent	Other
Tankerman	Tankerman	
ThirdAsstEngineer	Third Assistant Engineer, Third Engineer	
ThirdMate	Third Mate	
ThirdOfficer	Third Officer	
ThirdParty	Third Party	Other
TruckMechanic	Truck Mechanic	Other
Tunnelman	Tunnelman	
UtilityPerson	Utility Person	

Table C.1 (*continued*)

Code	Description	Reference
VettingInspector	Vetting inspector	Other
Welder	Welder	
Wiper	Wiper	
YardPersonnel	Yard Personnel	Other
Other	Other	

Annex D
(informative)

Waste type codes

Table D.1 gives waste descriptions from MEPC 644 and Directive 2000/59/EC and the corresponding codes. The codes are constructed with the MARPOL Annex number as the first digit, followed by a two-digit serial number. Serial number 00 is always allocated to the group “Other”.

Table D.1 — Waste type codes

Description	Code
MARPOL Annex I-related (Oily waste)	
Oily bilge water	101
Oily residues (sludge)	102
Oily tank washings (slops)	103
Dirty ballast water	104
Scale and sludge from tank cleaning	105
Other	100
MARPOL Annex II-related (Noxious liquid substance)	
Category X substance	201
Category Y substance	202
Category Z substance	203
Other substance (OS)	200
MARPOL Annex IV-related (Sewage)	
Black water	401
Grey water	402
Other	400
MARPOL Annex V-related (Garbage)	
Plastic	501
Floating dunnage, lining, or packing materials	502
Ground-down paper products, rags, glass, metal, bottles, crockery, etc.	503
Cargo residues: paper products, rags, glass, metal, bottles, crockery, etc.	504
Food waste	505
Incinerator ash	506
Other	500
MARPOL Annex VI-related (Emissions to air)	
Ozone-depleting substances and equipment containing such substances	601
Exhaust gas-cleaning residues	602
Other	600

Annex E
(informative)

Message type codes

Table E.1 gives message type codes and their description. It could be updated by revisions of this part of ISO 28005 or other International Standards, but receivers are not required to accept messages of other types than they can process. The “Normative reference” column gives a reference to where the content of the specific report is defined.

Table E.1 — Message type codes

Message code	Content of message	Normative reference
FAL	Single window (multiple FAL messages).	
FAL1	FAL 1 General declaration.	FAL
FAL2	FAL 2 Cargo declaration.	FAL
FAL3	FAL 3 Ship's stores declaration.	FAL
FAL4	FAL 4 Crew's effects declaration.	FAL
FAL5	FAL 5 Crew list.	FAL
FAL6	FAL 6 Passenger list.	FAL
FAL7	FAL 7 Dangerous goods manifest.	FAL
ISPS	ISPS Reporting to port.	ISPS, MSC 1305
BLU	Bulk loading and unloading report to port.	BLU
WASTE	Recommended report to port of waste onboard and to be disposed of in port.	MEPC 644
SR-SP	Sailing plan; before or as near as possible to the time of departure from a port within a system or when entering the area covered by a system.	IMO A.851
SR-PR	Position report; when necessary to ensure effective operation of the system.	IMO A.851
SR-DR	Deviation report; when the ship's position varies significantly from the position that would have been predicted from previous reports, when changing the reported route, or as decided by the master.	IMO A.851
SR-FR	Final report; on arrival at destination and when leaving the area covered by a system.	IMO A.851
SR-DG	Dangerous goods report; when an incident takes place involving the loss or likely loss overboard of packaged dangerous goods, including those in freight containers, portable tanks, road and rail vehicles and shipborne barges, into the sea.	IMO A.851
SR-HS	Harmful substances report; when an incident takes place involving the discharge or probable discharge of oil (Annex I of MARPOL 73/78) or noxious liquid substances in bulk (Annex II of MARPOL 73/78).	IMO A.851

Table E.1 (*continued*)

Message code	Content of message	Normative reference
SR-MP	Marine pollutants report; in the case of loss or likely loss overboard of harmful substances in packaged form IMO, including those in freight containers, portable tanks, road and rail vehicles and shipborne barges, identified in the International Maritime Dangerous Goods Code as marine pollutants (Annex III of MARPOL 73/78).	IMO A.851
SR-VOL	Voluntary ship reporting, e.g. AMVER.	
RECEIPT	A receipt stating that a message has been received and is being processed. The message sent as an acknowledgement does not contain any status of the request.	
ACK	An acknowledgement that a message has been processed and that this message contains the status of the request.	
OTHER	Any other report.	

NOTE The SW type codes are reserved for future single window standards as could be defined in a future part of this International Standard.

Annex F
(informative)

Service type codes

Table F.1 gives service type codes and their description. It could be updated by revisions of this part of ISO 28005 or other International Standards.

Table F.1 — Service type codes

Message code	Content of message
Pilot	Pilot-related services
Tug	Tug-related services
Mooring	Mooring-related services
Cargohandling	Cargo handling services
Freshwater	Freshwater-related services
Bunkers	Bunker oil-related services
Waste	Waste disposal services
Other	Other services

Annex G
(informative)

Examples of cargo and package codes

UNECE R21 contains the codes for cargo type and package type that are used in this part of ISO 28005. Table G.1 gives the current list of cargo types, while Table G.2 gives examples of package types.

Users shall refer to UNECE R21 when these codes are employed.

Table G.1 — Cargo type codes

Cargo code	Description
0	No cargo unit (liquid bulk goods)
1	No cargo unit (solid bulk goods)
2	Large freight containers
3	Other freight containers
4	Palletized
5	Pre-slung
6	Mobile self-propelled units
7	Other mobile units
8	(Reserved)
9	Other cargo types

Table G.2 — Package type codes

Package code	Description
AE	Aerosol
BG	Bag
BR	Barrel
CK	Cask
GB	Gas bottle
PK	Package
PA	Packet
RL	Reel
SU	Suitcase
TU	Tube

Annex H
(informative)

Common unit codes

Table H.1 gives some common unit codes taken from the code list defined in UNECE R20. Users shall refer to UNECE R20 when these codes are employed.

Table H.1 — Common unit codes

Code	Description
HTZ	hertz (frequency)
LTR	litre (volume)
MTQ	cubic metre, m^3 (volume)
KGM	kilogram (mass)
TNE	tonne, metric ton (mass)
KMQ	kilogram per cubic metre (density)
KNT	knot (velocity)
MSK	metre per second squared (acceleration)
MTR	metre (length)
NAR	number of articles (count)
NEW	newton (force)
NMI	nautical mile (distance)
NU	newton metre (torque)
RPM	revolution per minute (rotational velocity)
SEC	second (time)

Annex I
(informative)

UN hazard classes

The UN hazard classes used onboard ships are defined in the *International Maritime Dangerous Goods Code* (IMDG). For reference, the currently defined codes are given in Table I.1.

Table I.1 — UN hazard classes

Code	Description
1	Class 1: Explosives
1.1	Division 1.1: Substances and articles which have a mass explosion hazard
1.2	Division 1.2: Substances and articles which have a projection hazard but not a mass explosion hazard
1.3	Division 1.3: 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
1.4	Division 1.4: Substances and articles which present no significant hazard
1.5	Division 1.5: Very insensitive substances which have a mass explosion hazard
1.6	Division 1.6: Extremely insensitive articles which do not have a mass explosion hazard
2	Class 2: Gases
2.1	Division 2.1: Flammable gases
2.2	Division 2.2: Non-flammable, non-toxic gases
2.3	Division 2.3: Toxic gases
3	Class 3: Flammable liquids
4	Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases
4.1	Division 4.1: Flammable solids, self-reactive substances and desensitized explosives
4.2	Division 4.2: Substances liable to spontaneous combustion
4.3	Division 4.3: Substances which, in contact with water, emit flammable gases
5	Class 5: Oxidizing substances and organic peroxides
5.1	Division 5.1: Oxidizing substances
5.2	Division 5.2: Organic peroxides
6	Class 6: Toxic and infectious substances
6.1	Division 6.1: Toxic substances
6.2	Division 6.2: Infectious substances
7	Class 7: Radioactive material
8	Class 8: Corrosive substances
9	Class 9: Miscellaneous dangerous substances and articles

Annex J
(informative)

Ship type codes

Table J.1 gives ship type codes taken from UNECE R28. It is the (two- or three-digit length) code field that shall be used. Table J.1 is for information only, and is not necessarily up to date; implementors should therefore refer to UNECE R28.

Table J.1 — Examples of UNECE R28 ship type codes

Code	Ship type	Description
50	General cargo vessel	Vessel designed to carry general cargo.
501	Grain vessel	Vessel designed to carry grain.
502	Timber/log carrier	Vessel designed to carry logs and timber.
503	Wood chips vessel	Vessel designed to carry wood chips.
504	Steel products vessel	Vessel designed to carry steel products.
505	Carrier, general cargo/container	Vessel designed to carry general cargo and containers.
506	Temperature-controlled cargo vessels	Vessel designed to carry temperature-controlled cargo.
51	Unit carrier	Vessel designed to carry unit loads.
511	Full container ship/cellular vessel	Vessel designed to carry containers only.
512	RORO vessel	Vessel with ramp designed to carry roll-on/roll-off cargo.
513	Car carrier	Vessel designed to carry automotive vehicles or their knock-down parts.
514	Livestock carrier	Vessel designed to carry livestock.
515	Barge carrier – Lash ship	Vessel designed to carry barges. Lash means lighters aboard ship.
516	Chemical carrier	Vessel designed to carry chemicals in bulk or drums not in tanks.
517	Irradiated fuel carrier	Vessel designed to carry irradiated fuel.
518	Heavy cargo vessel	Ship designed to carry heavy cargo.
519	RoRo/container vessel	Vessel designed to carry both containers and roll-on/roll-off cargo.
52	Bulk carrier	Vessel designed to carry bulk cargo.
521	Dry bulk carrier	Vessel designed to carry dry bulk (expellers).
522	Ore carrier	Vessel designed to carry ore.
523	Cement carrier	Vessel designed to carry cement.
524	Gravel carrier	Vessel designed to carry gravel.
525	Coal carrier	Vessel designed to carry coal.

Table J.1 (*continued*)

Code	Ship type	Description
53	Tanker	Vessel solely equipped with tanks to carry cargo.
531	Crude oil tanker	Tanker designed to carry crude oil.
532	Chemical tanker, coaster	Tanker designed to carry chemicals in coastal traffic.
533	Chemical tanker, deep sea	Tanker designed to carry chemicals in deep sea.
534	Oil and other derivatives tanker	Tanker designed to carry oil and other derivatives.
54	Liquefied gas tanker	Tanker designed to carry liquefied gas.
541	LPG tanker	Vessel designed to carry Liquefied Petroleum Gas (LPG).
542	LNG tanker	Tanker designed to carry Liquefied Natural Gas (LNG).
543	LNG/LPG tanker	Tanker designed to carry Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG).
55	Other special tanker	Tanker designed to carry other special liquids.
551	Asphalt/bitumen tanker	Tanker designed to carry asphalt and bitumen.
552	Molasses tanker	Tanker designed to carry molasses.
553	Vegetable oil tanker	Tanker designed to carry vegetable oil.
57	Cargo and passenger vessel	Vessel designed to carry cargo and passengers.
59	Passenger ship	Vessel designed to carry more than 12 passengers.
591	Cruise ship	Passenger ship designed to carry tourists on specified routes.
592	Ferry	Vessel designed to ply regularly between two or more ports.
593	Other passenger ship	Vessel designed to carry passengers, not otherwise specified.
594	Passenger ship, sailing	Vessel designed to carry passengers and mainly propelled by sails.
60	Assistance vessel	Vessel designed to give assistance.
601	Tug, without tow	Vessel designed to tow objects but sailing alone.
602	Tug, with tow	Vessel designed to tow, and towing an object.
603	Salvage vessel	Vessel designed to salvage.
604	Rescue vessel	Vessel designed to effect rescue operations.
605	Oil combat vessel	Vessel designed to combat oil spills.
606	Oil rig	Object designed for drilling oil at sea.
607	Hospital vessel	Vessel designed to serve as a hospital at sea.
70	Other sea-going vessel	Sea-going vessel, not otherwise specified.
711	Pilot boat	Vessel designed to convey pilots to/from ships.
712	Patrol/measure ship	Vessel designed to guard, patrol or measure.
72	Work ship	Vessel designed to assist in work.
721	Supply vessel	Vessel designed to provide supplies.
723	Offshore support vessel	Vessel designed to provide offshore support.

Table J.1 (*continued*)

Code	Ship type	Description
724	Pontoon	Flat-bottomed vessel with a flat deck.
725	Stone dumping vessel	Vessel designed to dump stones.
726	Cable layer	Vessel designed to lay cable.
727	Buoyage vessel	Vessel designed to handle buoys.
728	Icebreaker	Vessel designed to break ice.
729	Pipelaying vessel	Vessel designed to lay pipe.
73	Push boat	Vessel designed to push other vessels.
74	Dredger	Vessel designed to scoop or suck mud or sand.
75	Fishing boat	Vessel designed for fishing.
751	Trawler	Vessel designed to drag a bag-like net.
752	Cutter	Small vessel that sometimes can be carried on a larger ship.
753	Factory ship	Vessel designed as a fish factory.
76	Research and education ship	Vessel designed for research and education.
761	Fishery research vessel	Vessel designed for fishery research.
762	Climate registration vessel	Vessel designed for climate registration.
763	Ship for environmental measurement	Vessel designed for environmental monitoring and measurement.
764	Scientific vessel	Vessel designed for scientific purposes.
765	Sailing school ship	Vessel designed for training, powered by sail.
76	Training vessel	Vessel designed for training.
77	Navy vessel	Vessel operated by a navy.
78	Structure, floating	Any floating structure.
781	Crane, floating	A crane mounted on a barge or pontoon.
782	Dock, floating	A submersible floating structure used as a dock.
80	Pleasure boat	Vessel designed for recreation.
81	Speedboat	Vessel designed for speed, often used for recreation.
82	Sailing boat with auxiliary motor	Vessel designed primarily for sailing, outfitted with an auxiliary motor.
83	Sailing yacht	A specific type of vessel mostly used for pleasure and designed for sailing.
84	Boat for sport fishing	Vessel designed for sport fishing.
85	Craft, pleasure, longer than 20 metres	Vessel longer than 20 metres, designed for recreation.
89	Craft, other, recreational	Vessel designed for recreation, not otherwise specified.
90	Fast ship	Fast, all-purpose vessel.
91	Hydrofoil	Vessel with wing-like structure for skimming at high speed.
92	Catamaran, fast	Fast vessel designed with two parallel hulls.

Annex K
(informative)

UNECE purpose of call codes

Table K.1 gives codes for ship calls that have been defined by UNECE UNTDD for code element 8025: conveyance call purpose description code. Table K.1 is for information only and is not necessarily up to date; implementors should therefore refer to the UNTDD.

Table K.1 — Purpose of call codes

Code	Description	Additional description
1	Cargo operations	Discharging and/or loading of cargo.
2	Passenger movement	Embarking and/or disembarking of passengers.
3	Taking bunkers	Taking bunker (refuelling).
4	Changing crew	Changing crew member(s).
5	Goodwill visit	Friendly visit.
6	Taking supplies	Taking supplies.
7	Repair	To effect repair.
8	Laid-up	Inactive service.
9	Awaiting orders	Awaiting job order.
10	Miscellaneous	Miscellaneous purpose of call.
11	Crew movement	Embarking and/or disembarking of crews.
12	Cruise, leisure and recreation	To visit a port for cruise, leisure and recreation.
13	Under government order	This is a visit to a port which has been ordered by a government.
14	Quarantine inspection	To have a quarantine inspection.
15	Refuge	To seek protection against something unpleasant and/or threatening such as bad weather or danger.
16	Unloading cargo	Discharging of cargo from the means of transport.
17	Loading cargo	Loading of cargo onto the means of transport.
18	Repair in dry dock	Vessel to undergo repair in a dry dock.
19	Repair in wet dock	Repair of a vessel in a dock without removing the surrounding water.
20	Cargo tank cleaning	Cargo tanks of the means of transport will be cleaned.
21	Means of transport customs clearance	Means of transport will be customs cleared.
22	Degassing	Means of transport will be degassed.
23	Waste disposal	Means of transport will dispose of her waste.

Annex L
(informative)

IMO FAL mapping

Table L.1 suggests a possible mapping from core data items defined in this part of ISO 28005 to required data elements in a number of reporting formats that were outlined in 1.2.

Table L.1 — Mapping core data items

Description	ISO 28005 Data Type	FAL 1	FAL 2	FAL 3	FAL 4	FAL 5	FAL 6	FAL 7	ISPS	BLU	WASTE	SR cod
Contact information of ship's agent	AgentType	X						X	X			T
Air draught	AirDraughtType									X		
Arrival draughts	ArrivalDraughtType									X		O
Clean ballast water	BallastStatusType									X		
Beam	BeamType									X		U
Loading plan, requirements and details	BulkLoadUnloadDataType									X		
Purpose of call	CallPurposeType								X			
Cargo description list	CargoDataType		X					X	X			
Brief description of cargo	CargoOverviewType								X			P
Certificate of registry	CertificateType (RegistryCertificate)	X										
Company name	CompanyType								X		X	T
Crew list	CrewListType					X						
Departure draughts	DepartureDraughtType									X		
Crew effects list	DutiableCrewEffectsType				X							
Entry position and time	EntryDataType											H
Person, date, reporting system	EPCMessageHeaderType								X		X	B
Date and time of arrival	ETAType	A		A		A	A			X	X	I
Date and time of departure	ETDType	D		D		D	D				X	
Exit position and time	ExitDataType											K
General description of dangerous goods	GeneralDescriptionofDGType											R
Gross tonnage	GrossTonnageType	X							X		X	U
Inmarsat call number	InmarsatCallNumberType								X			
Security infromation, CSO, port call list	ISPSShipReportType								X			
Last port of call	LastPortOfCallType	A		A		X				X	X	G
Ship's length overall	LengthOverallType									X		U
Location where report is made	LocationType		X						X			C,D
Name of master	NameOfMasterType	X	X					X				
Net tonnage	NetTonnageType	X										U
Next port of call	NextPortOfCallType	D		D							X	
Next report time	NextReportTime											N
Special requirements for OBO carriers	OBOLoadUnloadDataType									X		
Passenger list	PassengerListType						X					
Period of stay	PeriodOfStayType			A								
Number of crew and passengers	PersonsOnboardType	X		X								W
Port of arrival, position of ship in port	PortOfArrivalType	A		A		A	A		X		X	I
Port of departure	PortOfDepartureType	D		D		D	D					
Radio communications, channels etc.	RadiocommunicationType											M
Flag state	RegistrationPortType	X	X	X	X	X	X	X	X	X	X	A
Remarks	RemarksType	X										V,X
Bunkers on board > 5000 t	ROBBunkersType											X
Ship defects	ShipDefectsTypes											Q
Ship name, IMO number, call sign	ShipIDType	X	X	X	X	X	X	X	X	X	X	A
Course and speed, pilot onboard	ShipStatusType											E,F,J
Ship stores list	ShipStoresType			X								
Ship type	ShipTypeContentType	X							X		X	X
Brief description of voyage/cargo	VoyageDescriptionType	X										
Voyage number	VoyageNumberType	X	X	X	X	X	X	X				
Waste and residue disposal requirements	WasteDisposalRequirementsType	A										
Waste and residue detailed infromation	WasteInformationType										X	
Route	WayPointListType											L
Weather	WeatherObservationType											S

L.1 General

Table L.1 indicates how core data items can be mapped to various information elements required in the IMO FAL. It does not prescribe any particular mapping and this part of ISO 28005 does not guarantee that the mapping presented is in all respects correct.

L.2 FAL forms

The mapping is based on the IMO FAL convention and represents a best-effort mapping of information elements to core element tags. The codes “A” and “D” represent data elements that are uniquely used in arrival and departure messages, respectively.

L.3 ISPS – International Ship and Part facility Safety code

The codes listed are derived from MSC 1305.

L.4 BLU – Bulk Loading and Unloading code

The codes listed are derived from the BLU.

L.5 WASTE – Recommended waste report

The codes listed are derived from MEPC 644.

L.6 SR – Ship reporting

The codes listed are derived from IMO A.851. The letters correspond to the list of data items that are required in general. For specific reports, refer to the respective ship reporting system to see what elements are required in specific circumstances.

Annex M
(informative)

Short overview of XSD coding

Data type definitions have been specified as an XSD code section in this document. The sections used are not well-formed XSD documents and need to be included in a complete XSD file to be valid. Details on structure of XSD files can be found in XML Schema Part 1: *Structures*[16].

This annex gives a brief overview of how the example code is to be understood. For details, refer to the above standard.

XSD is a specification language that is based on XML. An XML file is tree-structured, where each element is delimited by start and stop tags enclosed in angle brackets (less than and greater than). The main data content is found between the tags. The stop tag has the same name as the start tag, but with a leading slash ("/"). Some elements do not have any data contents and no end tag. In that case, the slash ("/") is placed at the closing end bracket of the first tag. Elements may have attributes although they do not have data contents.

```
<NormalTag1>Data content</NormalTag1>
<TreeTag1>
  <TreeTag2>Data</TreeTag2>
</TreeTag1>
<EmptyData/>
<EmptyDataAttribute attribute="value"/>
```

The XSD code specifies how another XML file is structured and how data content can be extracted. There are two types of definitions: one type defines "abstract" data types that need to be given specific names, e.g. PortType and UNClassType. These definitions have top-level tags that always end in Type.

```
<xs:simpleType name="LocalType">
  <xs:restriction base="epc:token">
    <xs:enumeration value="A"/>
    <xs:enumeration value="B"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="StandardType">
  <xs:sequence>
    <xs:element name="ElementOne" type="LocalType"/>
    <xs:element name="ElementTwo" type="xs:decimal"
                minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

In this case, the example defines a special data object type `LocalType` that is only used as an element in the new standard type `StandardType`. Most object definitions do not have such local types, so this part is empty in most definitions.

The example defines a new data object with two elements, ElementOne and ElementTwo. In XML they shall be coded as follows:

```
<StandardType>
  <ElementOne>A</ElementOne>
  <ElementTwo>1.23</ElementTwo>
</StandardType>
```

Thus, ElementOne has been defined as a data element encoded in a normalized text string (epc:token – some limits to structure of text string), and which has additional restrictions through the inclusion of the xs:restriction tag. In this case, it is restricted to a fixed set of enumerated codes.

ElementTwo has been defined as a decimal number. The minOccurs attribute says that this element is optional (minimum number of occurrences is zero) and the maxOccurs allows any number of elements to be included. Thus, the following two XML fragments are both valid.

```
<StandardType>
  <ElementOne>A</ElementOne>
</StandardType>

<StandardType>
  <ElementOne>A</ElementOne>
  <ElementTwo>1.23</ElementTwo>
  <ElementTwo>4.56</ElementTwo>
  <ElementTwo>7.89</ElementTwo>
</StandardType>
```

Note that when minOccurs is missing, the default value is one (required minimum once). A missing maxOccurs also has the default value one. Definitions that do not have any of these attributes are required exactly once.

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