European Maritime Safety Agency

EMSA CleanSeaNet

Data Centre

[CSNDC]

External Interface Control Document (EICD)

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1 Introduction

This is the Interface Control Document describing CSN-DC external interfaces.
The document contains for the various external interface the detailed definition of the interface protocol and of the exchanged information. In some cases the document is still to be compelted. In particular:

- **TBD**: indicates ares of the specification that cannot be completed at this stage because some information is missing or some elements still need to be defined/agreed
- **TBW**: indicates areas of the specifications where potentially the detail could have been defined on the basis of some assumptions, but is preferred to postpone it until some further consolidation is reached (e.g. the layout of the report templates, etc.)

1.1 Document Organization

The document defines the software interfaces between CSN-DC and all the external entity involved in any of the business processes.

The following sections are included in the document.

Section	Description
Introduction	This section.
CSN-DC external interfaces	A full description of the system external interfaces in terms of protocols and format to be used.
Annexes A-K	A detailed description of the Interface Control Document artifacts referred to in the Section 2 (XML schemas, PDF templates, SOAP message definitions,…)

1.2 Reference documents

Document Title	Identifier	Internal Reference
Invitation to Tender concerning the development of “EMSA CleanSeaNet Data Centre”	EMSA/OP/06/2009	[ITT]
Tender Specifications	Enclosure I	[E-I]
ICT Architecture, System and application Technical Landscape	Enclosure V	[E-II]
Ordering Service for Earth Observation Products, version 0.9.4, date: 2008-09-05	OGC 06-141r2	[HMA-ORD]
OGC Catalogue Services Specification 2.0 Extension Package for ebRIM Application Profile, version 0.2.2, date: 2008-10-23	OGC 06-131r5	[HMA-CAT]
OGC OpenGIS Sensor Planning Service Application Profile for EO Sensors, version 0.9.5, 19/11/2007	OGC 07-018	[HMA-SPS]
OGC User Management Interfaces for Earth Observation Services, version 0.0.4, 30/06/2009	OGC 07-118r1	[HMA-IDM]
ACS Quality Guidelines for HMI Design, issue 3.2 17/07/2009	SW-PA-ACS-QA-0103	[HMI-GL]
EMSA CleanSeaNet Data Centre Functional Specification	CSNDC-OF-ACS-EMSA-0004 v2.0	[CSN-FUN]
EMSA CleanSeaNet Data Centre Technical Design	CSNDC-DD-ACS-EMSA-0102 v2.0	[CSN-TEC]

Document Title	Identifier	Internal Reference
OGC Web Processing Service Specification, version 1.0.0	OGC 05-007r7	[OGC-WPS]

1.3 Abbreviations and acronyms

Abbreviation	Definition
AIS	Automatic Identification System
APT	Acquisition Planning Tool
BPD	Business Process Diagram
BPMN	Business Process Model Notation
CDM	Conceptual Data Model
COTS	Commercial Off The Shelf
CS	Coastal States
CSD	Clean Sea Net Service Desk
CSN-DC	Clean Sea Net Data Centre
DAIL	Data Access Interaction Layer
DREAM	Decision Support and Real Time EO Data Management
EO	Earth Observation
EOLI-SA	Earthnet On-Line Interactive – Stand Alone
ESA	European Space Agency
FEP	Front End Processor
GCM	GMES Contributing Mission
GMES	Global Monitoring for the Environment and Security
GML	Geographic Markup Language
GSCDA	GMES Space Component Data Access
GUI	Graphical User Interface
HMA	Heterogeneous Mission Accessibility
ICD	Interface Control Document
IF	Interface
IPF	Instrument Processing Facility
LRIT	Long Range Identification and Tracking
NRT	Near Real Time
OGC	Open Geospatial Consortium
OPeNDAP	Open-source Project for a Network Data Access Protocol
PKI	Public Key Infrastructure
SAR	Synthetic Aperture Radar
SO	Satellite Operators
SP	Service Providers
SPA	Swath Planner Application
THREDDS	Thematic Realtime Environmental Distributed Data Services
UML	Unified Modelling Language
WFS	Web Feature Server
WMS	Web Map Server
XML	eXtensible Mark-up Language

Table 1-1 Abbreviations and Acronyms

1.4 Annexed documents

Following documents report detailed information about the interfaces exposed in this document and should be regarded as applicable companion documents for this EICD:

Document Title	Internal Reference
[EICD] eo product mapping for SP, issue 1.3.4	[EOP_SP]
[EICD] csndc_os mapping for SP, issue 1.3.3	[OS_SP]
[EICD] csndc_ds mapping for SP, issue 1.3.3	[DS_SP]
[EICD] csndc_qn mapping for SP, issue 1.3.3	[QN_SP]
[EICD] csndc_qr mapping for SP, issue 1.3.3	[QR_SP]
[EICD] csndc_os mapping for MSP, issue 1.3.4	[OS_MSP]
[EICD] WPS 1.0.0 Execute mapping for MSP, issue 1.3.4	[WPS_MSP]
[EICD] planning file mapping for SP, issue 1.3.4	[PL_SP]

2 CSN-DC external interfaces

Following table summarize the External Interfaces of CSN-DC defined in [CSN-FUN]

ID	Ext I/F	Internal Module	Data Flow	Data	Comment	Estimated Volume and Repository
EIF-01	Vessel Traffic Information	WUP Core	I	AIS	Data retrieved during the WUP interactive sessions.	Unit: 100 KB [1] Frequency: 100 [2] Total: 10,000 KB Not stored
EIF-02	Vessel Traffic Information	IIF	I	AIS	Data for systematic analyses.	Unit: 1000 KB [3] Frequency: 15 Total: 15,000 KB WUP DB
EIF-03	Vessel Traffic Information	DAM	O	SAR Images	Data can be accessed by external systems for visualization	Unit: 50 KB Frequency: unknown[4] Total: unknown
EIF-04	SP	IIF	I	SAR-Native1 image		Unit: 1000 MB Frequency:15 Total: 15000 MB ISM
				Oil spill warnings and associated clip images: SAR analysed oil spill detections		Unit: 200 KB Frequency:75 [5] Total: 15 MB ISM

[1] For interactive analysis it is estimated that the file will only contain few ships and the file size is of the order of 100 KB
[2] It is estimated considering 15 daily reports involving 2 states per report and 3 operators performing query to Vessel Traffic information data per coastal state.
[3] For systematic analyses the query will probably retrieve a larger number of ships.
[4] EMSA to provide estimates about the frequency of data access.
[5] It has been assumed an average of 5 oil spill per image

				Oil spill notifications: SAR analysed oil spill detections		Unit: 200 KB Frequency:75 Total: 15 MB ISM WUP DB
				SAR wind and wave/swell layer: SAR derived wind and wave/swell		Unit: 20 + 20 KB Frequency:15 Total: 0.6 MB ISM WUP DB
				SAR Vessel Detection layer: SAR derived vessel detection file 1 per SAR image		Unit: 10 KB Frequency:15 Total: 0.15 MB ISM WUP DB
				SAR image quality notification: Suitability of product (YES or NOT) and position accuracy/displacement vector, 1 per SAR image.		Unit: 10 KB Frequency:15 Total: 0.15 MB ISM
				Quality Report: on SAR image, oil spill detection and vessel detection analysis, GML/XML file, 1 per image/product.		Unit: 1 MB Frequency:15 Total: 15 MB ISM
				Activity Detection		Unit: 10 KB Frequency:TBD Total: TBD MB ISM
EIF-05a	SP	DAM	O	MyOcean data: • sea surface temperature • surface current speed & direction • chlorophyll a concentration • ice edge • surface winds	MYOcean data distributed to the SP, via OGC Web Services.	Unit: 10*100 MB [6] Frequency: 1 Total: 1000 MB ISM

[6] It is estimated that about 10 different parameters are obtained daily from MyOcean. The estimated size of each parameter has been set to 100 MB, but in fact it depends on many unknowns, which are: data frequency and timeliness, time resolution, spatial resolution, archival policy (which depends on the usage of the system)

EIF-05b	SP	DAM	O	Vessel Traffic Information data	Vessel positions in the geographic area covered by any SAR-Native1 image for the 6 hour interval prior to image sensing time are made available as features served by a OGC WFS	Unit: 1000 KB [7] Frequency: 15 Total: 15,000 KB WUP DB
EIF-06	SP	IIF	I	MD5 of the sub-data packages sent by the SP (see EIF-04) and list of all sent sub-data packages.	These data are used for checking the timeliness of the dissemination of data from the SP.	Unit: 1KB Frequency: 150 Total: 0,15 MB ISM
EIF-07	MyOcean	IIF	I	MyOcean data: • sea surface temperature • surface current speed & direction • chlorophyll a concentration • ice edge • surface winds	Daily data transferred to the CSN-DC. Detailed list of parameters is **TBC**.	Unit: 10*100 MB Frequency: 1 Total: 1000 MB ISM
EIF-08	EO Data Provider (this includes EUMETSAT, ECWMF, ESA, SpotImage, etc.)	IIF	I	EO data, e.g. optical data.	It is assumed that the operator interactively places the order for the data, using the available HMA tools, e.g. EOLI-SA and makes sure that the received data are placed on the correct SFTP basket. Alternatively this can be performed by subscription, whereby a certain number of data is routinely accessed to an SFTP basket.	TDB ISM
EIF-09	ENC	WUP core	I	Electronic Nautical Charts		Unit: 10 KB Frequency: 200 [8] Total: 2 MB Not stored
EIF-11a	External Model Service Providers (MSP)	PMA	I/O	• CSN-DC sends oil spill description • External process executes a model and returns oil spill evolution	SFTP is used on both directions for sending the request of triggering and receiving the results. Optionally, a WPS interface can be used instead (where available at MSP)	Unit: 1 MB Frequency: 100 [9] Total: 100 MB

[7] For systematic analyses the query will probably retrieve a larger number of ships.
[8] The frequency depends on how many times a WUP users "refresh" the information request to the WMS
[9] This estimate considers 15 SAR images per day, with an average of 6-7 oil spills per image

EIF-11b	MSP	PMA	I	Area(s) of Model Coverage	Shape file to be inserted by web-based User Interface	Unit: 1 MB Frequrency: 1 Total: 1 MB POR DB
EIF-12a	CS	POR	I	Regions of interest, frequency and number of scenes	These files are ingested into the POR by the SD operator	Unit: 1 MB Frequency: 1 Total: 1 MB POR DB
EIF-12b	SO (Feasibility planning tools)	POR	O	Query Files		Unit: 1 MB Frequency: 0.1 Total: 0.1 MB
EIF-12c	SO (Feasibility planning tools)	POR	I/O	Planning files (with the list of planned scenes and relevant metadata)	The POR can ingest the files exported from the planning tools and export the planning files into a format compatible with the planning tools.	Unit: 1 MB Frequency: 0.1 Total: 0.1 MB POR DB
EIF-12d	SO (ESA only)	POR	I	Acquisition Status files	This interface is only for ESA as for the others a manual update on the POR web GUI is foreseen.	Unit: 1 MB Frequency: 0.1 Total: 0.1 MB POR DB
EIF-13	SO	POR	O	Satellite data licenses	The satellite data licenses are distributed via email to the satellite operators.	Unit: 5 MB Frequency: 0.1 Total: 0.5 MB
EIF-14	SP	POR	O	Service Orders	The service orders are distributed via email to the service providers.	Unit: 5 MB Frequency: 0.1 Total: 0.5 MB
EIF-15	Users	PDE	O	Warnings and Alerts		Unit: 5 MB Frequency: 450+450[10] Total: 4500 MB
						Negligible
						Negligible
						Negligible
EIF-16	Users	PDE	O	Systematic disseminated products (data and products)	Systematic distribution for interested users	Unknown
EIF-17	External catalogues	DAM	I	Access to external catalogues for federated search.		Unit: 10 K Frequency: 100 Total: 1 MB ISM

Table 2-1 CSN-DC External Interfaces

Following sections will describe in details the above interfaces in terms of protocols, formats and operations. For the sake of clarity, interfaces are grouped by external actor (column 'Ext I/F' of the above table).

[10] 450 Alerts + 450 warning. Estimated on the basis of 15 images per day, 3 coastal states interested by oil spill, 10 users registered for distribution

2.1 Vessel Traffic Information

2.1.1 EIF-01: Vessel Traffic Information (AIS) data to WUP core

The protocol to be used is the OGC WFS 1.1.0 (HTTP binding). In particular, following service requests shall be supported:

- *GetCapabilities*
- *GetFeatures*
- *DescribeFeature*

The Feature provided by the WFS serving Vessel Traffic Information (AIS) data shall support the GML schema produced in Annex A. Some example of requests are reported in **ANNEX T – GEOSPATIAL SERVICES REQUESTS DETAILS AND EXAMPLES**.
NOTE: since this request is accessing a very large database, requests over large areas and time window might take long time and even fail because of timeout. Should this occur, it is recommended to use the method illustrated in the next paragraph for accessing AIS data.

2.1.2 EIF-02: Vessel Traffic Information (AIS) data to IIF

The protocol to be used is the OGC WFS 1.1.0 (HTTP binding). In particular, following service requests shall be supported:

- *GetCapabilities*
- *GetFeatures*

The Feature provided by the WFS serving vessel traffic information data based on AIS shall support the GML schema produced in Annex A

Alternatively, AIS data can be retrieved from the EMSA SFTP in pull mode. The data are placed on the FTP in GML format and follow this structure and naming convention:

- For each service a folder with name *frame*-<SERVICE_ID> is created (e.g. frame-5667)
- the file name for each data chunk is *frame*-<SERVICE_ID>-<UTC_TIMESTAMP> (e.g. frame-5667-20140612T102402.gml), where:
    - UTC timestamp is the timestamp of creation of the file

2.1.3 EIF-03: SAR images from DAM

The images provided to external systems from DAM, shall be made available through an OGC WMS 1.3.0 (HTTP binding). Each image will be presented as a WMS layer named with the EO image uid. The WMS shall support following service requests:

- *GetCapabilities*
- *GetMap*

GetMap operation shall support, at least, JPG and PNG output formats.

2.2 Service Providers

2.2.1 EIF-04: EO products, OS and Detected Ships Analysis information to IIF

The protocol to be used is the SFTP in push mode.
The SP shall provide one or more packages at the time. Supported package file formats are:

- .zip

- .tar
- .tgz

Extension tar.gz is not supported.

Each package could be part of a set of packages related to the processing of a given EO product: not all the information are produced and transmitted at the same time.
Currently, following types of packages are expected:

- Activity detection
- Oil Spill Warnings
- EO Image
- Oil Spill Notifications
- SAR Derived
- Quality Report
- Quality Notification

Please Note: in case of Clean Sea report the CSN DC expects to receive an Oil Spill Notification package with no Oil Spill feature GML files and the Package info XML file explicitly stating 0 total OS (see attribute /csn:dataPackage/csn:oilSpills/@total in appendix B)

A transmission is made of a minimum of 1 and a maximum of 4 packages of different types.
Following table reports the expected content of each package.

Package Type	**Package Content**	**File format**	**Description**	**Multiplicity**	**Mandatory (M)/ Optional (O)**
Oil Spill Warning	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as “OS_WARNING”	1	M
	Oil Spill feature GML file	XML as per schema in Annex C	A file describing a detected OS. As early warnings only a limited set of OS parameters will be valorised. The exact list of elements to be used is detailed in [OS_SP]. The OSW package can hold 1 to N warnings however EMSA requests all Service Providers to create 1 OSW per OSW package. This entails that the "total" attribute to be always 1.	N	M
	Clip image file	JPG	A clip image file to be associated to a given OS.	N	M

EO Product	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "EO_PRODUCT"	1	M
	EO Native Image file (s)	L1b native formats	Level 1b EO product. It includes both SAR and Optical platforms. The file extension must match the original format extension (e.g. '.N1' for ENVISAT ASAR). In case of RADARSAT 1 and RADARSAT 2 this file is the zip file containing a directory with a name corresponding to the one of the zip file itself. This directory contains all files of the product including a metadata xml file named "product.xml" (please note that this is compliant with RADARSAT product specifications). For Sentinel-1, image can be delivered in several EO Native image files (namely in SAFE format)	N	M
	EO Product metadata GML file	XML as per EOP schema	The EOP application profile compliant metadata description of the EO product. Applicable restrictions and conventions are described in the annexed document [EOP_SP]	1	M
	EO browse image file	JPG	Browse image file	1	O
Quality Notification	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "QUALITY_NOTIFICATION"	1	M
	Image quality notification	XML as per schema in Annex E	Suitability of product (YES or NOT) and position accuracy/displacement	1	M

			vector, 1 per SAR image. Expected XML content is described in [QN_SP]		
	Not Analyzable area mask	Geotiff file	Image file representing Not Analyzable pixels of the image (any other pixel shall be set to transparent color code or valorised to pure black).	1	O
Oil Spill Notifications	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "OS_NOTIFICATION"	1	M
	Oil Spill feature GML file	XML as per schema in Annex C	A file describing a detected OS. It contains full set of OS parameters. /csn:OilSpill/csn:origin element has fixed value of 'DETECTED'. The exact list of elements to be used is detailed in [OS_SP]. The OSN package can hold 1 to N notifications however EMSA requests all Service Providers to create 1 OSN package which may contain N OSN GML files In the case of a 'CleanSea' where no oil spills are detected, no oil spill feature GML should be provided. The OSN Package should only contain the Package Info XML file. NOTE: in order to avoid some physical limits of the Oracle ingestion functions, it is necessary that the number of vertexes for each oil spill polygon is < 450 points.	N	O[11]
	Clip image file	Preferred image format Geotiff with a pixel depth	A clip image file to be associated to a given OS. Please see Annex N for	N	M

[11] Please note that Oil Spill feature GML file is not provided only in case of a Clean Sea report

		not greater than 8bit. See also Annex N.	details about the expected zoom level and content of the clip image.		
SAR Derived	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "SAR_DERIVED"	1	M
	SAR extracted wind file	NetCDF (CF convention v1.4)	Gridded file with SAR extracted wind field	1	O
	SAR wave/swell extracted file	NetCDF (CF convention v1.4)	Gridded file with SAR extracted wave field	1	O
	Detected Ship feature GML file	XML as per schema in Annex D	A file describing a detected ships. Expected XML content is described in [DS_SP].	N	O
Quality Report	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "QUALITY_REPORT"	1	M
	Quality report file	XML as per schema in Annex E	A file describing the quality features of the image in terms of coverage compliance and usable area. Expected XML content is described in [QR_SP]	1	M
Activity Detection	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "ACTIVITY DETECTION"	1	M
	Activity Detection	XML as per schema in Annex S		1	M

Table 2-2 Data package content for EIF-04

2.2.2 EIF-05a: MyOcean data from DAM

The protocol to be used is OGC CSW 2.0.2

Supported service requests for CSW protocol are:

- *GetCapabilities*
- *GetRecords*
- *DescribeRecord*
- *GetRepositoryItem*

More specifically, the *GetRecords* operation shall be used to browse and identify a MyOcean dataset of interest and the *GetRepositoryItem* operation shall be used for retrieving the URL to original NetCDF file.

The Record provided by the CSW service, describing a MyOcean data offering through CSN-DC, shall support the schema in Annex F. Some examples of requests are reported in **ANNEX T – GEOSPATIAL SERVICES REQUESTS DETAILS AND EXAMPLES**.

2.2.3 EIF-05b: Vessel Traffic Information data from DAM

The protocol to be used is OGC WFS 1.1.0

Supported service requests are:

- *GetCapabilities*
- *GetFeatures*
- *DescribeFeature*

More specifically, Vessel Traffic Information data are organized in Features listed by the *GetCapabilities* operation. The *DescribeFeature* operation provides xsd schemas describing Vessel Traffic Information Features. The *GetFeatures* operation shall be used to get a set of Features (i.e. vessel positions and data) on a specific geographical area and in a given time range.

Features provided by the WFS serving AIS data support the GML schema produced in Annex A. Some examples of requests are reported in **ANNEX T – GEOSPATIAL SERVICES REQUESTS DETAILS AND EXAMPLES**.
Additionally files are also packaged in GML files, with a simplified structure, that are typically distriburted via FTP to the Service Providers, see section 25.5 for an example of such file.

2.2.4 EIF-06: MD5 and package list to IIF

The protocol to be used is SOAP over HTTP.
The SP shall support a SOAP message with request/response as per Annex G. This appendix also contains example calls and some non-nominal and error cases.

The SOAP service does not validate the filenames according to the package naming convention. Therefore a returned acknowledgement does not ensure correctness of the filenames.

Package List

The full list of delivered packages is contained in the last SOAP message which is sent by the SP within the element <PackageList>. This attribute is optional as it is filled only for the last package of the transmission. The CSN DC checks this list with what has been delivered to the CSN DC and returns a response to the Service Providers.

2.2.5 EIF-14: Service orders from POR

Service orders are distributed via e-mail as PDF attachments.

The PDF file template shall be as in Annex H.

2.3 Satellite Operators

2.3.1 EIF-12a: Region of interest to POR

Region of interest are the coverage requirements areas, the tasking areas, and the alerting areas. They are imported into the system by EMSA CSNDC operators using the POR interface. They must be in ESRI shapefile format and contain the following information:

- Coverage requirements:
  - TITLE: reference of the coastal state for the coverage requirements
  - JANUARY: number of expected scene for the this month
  - FEBRUARY: number of expected scene for the this month
  - MARCH: number of expected scene for the this month
  - APRIL: number of expected scene for the this month
  - MAY: number of expected scene for the this month
  - JUNE: number of expected scene for the this month
  - JULY: number of expected scene for the this month
  - AUGUST: number of expected scene for the this month
  - SEPTEMBER: number of expected scene for the this month
  - OCTOBER: number of expected scene for the this month
  - NOVEMBER: number of expected scene for the this month
  - DECEMBER: number of expected scene for the this month
  - COMMENTS: optional comment

- Tasking areas:
  - PLANNING_R: reference to the planning area
  - Area: area (in Km2)
  - SP1: Main service provider
  - SP2: Secondary service provider
  - SP3: Tertiary service provider
  - SP4: Quaternary service provider

- Alerting areas:
  - Country: name of the coastal state to which this refers
  - REMARKS: optional comments
  - ABBREV: abbreviation string of the country (e.g. PT for PORTUGAL)
  - SUBAREA: subarea name (normally it is baseline for all countries, indicated as e.g. PT_BASELINE, with some exception for countries where there is more than 1 area)

2.3.2 EIF-12b/c/d: Planning files to POR

The protocol to be used is HTTP (upload/download through the WUP POR application)
Planning files shall support CVS and XML formats as:

Query Files

- EOLI Query XML
- SWATH PLANNER region01 file
- APT region01 file

Planning files (with the list of planned scenes and relevant metadata)

- EOLI .usr or ShoppingCart
- SWATH PLANNER .frm or .tbl files

- APT ACP format (xml)
- CSNDC Planning Format (XML) (see below)

Acquisition Status files

- EOLI Order Status file (.ord file)

A **CSNDC planning file format** has been defined, which will be used for loading planning data into the CSNDC Planning Tool (POR). This planning file is defined trying to exploit as much as possible the eop.xsd file format and the sar extension of the eop.xsd file for SAR images.
The detailed format is reported in Annex Q, while the business rules for filling in the file and some examples are provided in [PL_SP].
The POR planning file format will become the unique format for exchanging planning information between EMSA and its providers.
Files exported from the POR: these are the same as for the planning files. In particular the POR will export each individual service in the format in which it was originally imported.

2.3.3 EIF-13: Satellite data licenses from POR

Satellite data licenses are distributed via e-mail as PDF attachments.
The PDF file template shall be as in Annex I.

2.4 MyOcean

2.4.1 EIF-07: Meteo-oceanographic data to IIF

The protocol to be used is SFTP in push mode.
Data shall be made available daily (TBC) as NetCDF files (conventions v1.4) containing following gridded information:

- sea surface temperature
- surface current speed & direction
- chlorophyll a concentration
- ice edge
- surface winds

The gridded data shall have following time and spatial resolution: **TBD**

2.5 EO Data Providers

2.5.1 EIF-08: EO data to IIF

The protocol to be used is SFTP in push mode (**TBC**).

2.6 ENC

2.6.1 EIF-09: Nautical chart to WUP core

The protocol to be used is OGC WMS HTTP binding version 1.3.0.
The following ENC layers shall be presented as WMS layers:
TBD (EMSA)

The WMS shall support following service requests:

- *GetCapabilities*
- *GetMap*
- *GetFeatureInfo*

GetMap operation shall support, at least, JPG and PNG output formats. Some examples of requests are reported in **ANNEX T – GEOSPATIAL SERVICES REQUESTS DETAILS AND EXAMPLES**.

2.7 Model Service Providers

2.7.1 EIF-11a: Oil Spill evolution to PMA

The interface between CSNDC and the Model Service Providers (MSP) supports two alternative scenarios:

- FTP transferring of process request/model outputs
- Service call according to OGC Web Processing Service (WPS) specification

2.7.1.1 File Transfer Protocol scenario

The protocol to be used is SFTP.

Request (CSNDC to MSP)

PMA puts in an SFTP basket a package containing the observed Oil Spill for which it is requested to run the model and the process parameters
Supported package file formats are:

- .zip
- .tar
- .tgz

The package will be uploaded by the *opemsa* user of the CSN DC to the “MSP/out/_temporary_” directory of the MSP account on the EMSA/CSN sFTP server, and subsequently moved up to the “MSP/out” directory. It will be responsibility of the MSP to poll this “MSP/out” directory for retrieving the information. The MSP will have only read rights visibility of the “MSP/out” directory.

Response (MSP to CSNDC)

External processes read the input package, run the model and produce the requested hindcast/forecast. For one spill, CSNDC is expected to receive in general two sets of information: one for forecast and one for hindcast. They shall however be merged into the same package, whereby the difference between forecast and hindcast is simply inherent in the timestamp of the individual simulation steps (backword in time for hindcast and ahead in time for forecast).
Each response shall consist of a package with

- a summary of the processing also including the trajectory of the centre of mass (in a single XML file as per Annex O)
- many GML files (one per time step) of the predicted Oil Spill (each of them shall adhere to schema in Annex C).
- a NetCDF file with gridded concentration of particles (format of the file is specified in Annex P)

Supported package file formats are:

- .zip
- .tar
- .tgz

The package shall be pushed/uploaded by the MSP to EMSA/CSN sFTP server for ingestion to the CSNDC. Each MSP shall have a dedicated username/password protected account on the EMSA/CSN sFTP server.
The MSP shall first transfer the pushed/uploaded data to the temporary directory and then move it one directory up to the directory which will be regularly polled by the CSNDC for retrieving the data to be ingested in the CSNDC.

Following table reports the expected content of above mentioned packages.

Package type	**Package Content**	**File format**	**Description**	**Multiplicity**	**Mandatory/ Optional**
Process request (input package)	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "PROCESS_REQUEST"	1	M
	Oil Spill feature GML file	XML as per schema in Annex C	A file describing a detected OS.	1	M
	Process request XML file	XML as per schema in Annex J	A file describing the model name and input parameters to be used in the processing.	1	M
Process response (output package)	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "PROCESS_RESPONSE"	1	M
	Oil Spill feature GML file	XML as per schema in Annex C.	A file describing a predicted OS for each time step in the evolution. The exact list of elements to be used is detailed in [OS_MSP].	N	M (not to be provided only in the case that processing ended in error)
	Model output description XML file	XML as per schema in Annex O	A single file describing the model output summary and, if processing ended successfully, the trajectory of the centre of mass of the oil spill.	1	M (to be provided also when processing ended in error)
	NetCDF file containing the gridded concentration	NetCDF file format as specified in Annex P	A single file containing gridded concentration of particles for each time step in the run. Within	1	M (not to be provided only in the

	of particles		one run the grid shall not change.		case that processing ended in error)

Table 2-3 Input/Output package content for EIF-11

2.7.1.2 Web Processing Service scenario

The OGC Web Processing Service (WPS) interface standardizes the way processes and their inputs/outputs are described, how a client can request the execution of a process, and how the output from a process is handled. WPS uses standard HTTP and XML as a mechanism for describing processes and the data to be exchanged.

The MSP shall expose a WPS service which the CSNDC will call for executing a model run on a given observed Oil Spill.
CSNDC uses the WPS specification to pass to the MSP:

i) the oil spill polygon which needs to be modelled,
ii) the relevant parameters for the model run, e.g. time, hindcast and/or forecast, oil characteristics, scene ID, oil spill ID, name of run, etc.

The protocol to be used is OGC WPS 1.0.0

MSP are requested to support following service requests:

- *GetCapabilities*
- *DescribeProcess*
- *Execute*

More specifically, the WPS asynchronous execution scenario shall be supported as described in Section 10.3.1 of [OGC-WPS].
In such a scenario, the MSP WPS shall keep the Status element of the stored Execute response document up to date while the request is being processed. The CSNDC can poll the updated Execute operation response via the URL identified for this purpose in the Execute response document.

As a conseguence, the DescribeProcess service call response is expected to have the “statusSupported” parameter set to “true”.

The exact specification of the WPS Execute request and response documents for supporting the oil spill model run via WPS in CSNDC is reported in annexed document [WPS_MSP].

It is to be noted that the output of the processing consists in the same zipped package described in Table 2-3. The package shall be made available by the WPS in the same CSNDC sFTP basket referred to in section 2.7.1.1 and a pointer to that location shall be made available in the WPS Execute Response document as detailed in [WPS_MPS].
Main advantage of the WPS scenario is that it allows for a better control on the processing as it includes the ability to ask for status update and completation percentages.

2.7.2 EIF-11b: Area of Model Coverage

Each model service provider (MSP) shall provide a (set of) Area(s) Model Coverage (AMC) for each model made available to CSNDC processing. All identified oil spills intersecting this area(s) will be notified to the MSP.

The AMC shall be provided in the format of a set of shape files to be uploaded thorugh a dedicated Web Interface by the MSP operator.

The shape file set shall be made of the following files:

File	Extension	Content	Note
Main shape file	.shp	Feature geometry. I.e. the geometry of the AMC(s)	More than one geometry can be put into the file. Each geometry shall be a closed and not self-intersecting Polygon. The coordinate shall be expressed according to WGS84. Maximum number of points for each polygon is 100. Maximum number of polygons is 10.
Shape index file	.shx	Shape index format	
Attribute file	.dbf	Attributes for the given geometries.	The following attributes are mandatory and shall be provided for each geometry: - 'name' (string): name of the area (unique identifier of the area according to naming convention expressed below) - 'model' (string) : name of the model to which the AMC refers. It is a responsibility of the MSP to provide here a name that uniquely identifies the model to be run. This same name will be used by CSNDC to specify the model to run (see 2.8.1).

The geometries shall be expressed as polygons with lat lon values in WGS84 so a projection (.prj) file is optional. If present, the .prj file shall refer to WGS84.

AMC name convention:
The name of the AMC shall be compliant to following naming convention:
<MSP_ACRONYM>_<model>_<N>

Where <MSP_ACRONYM> is an acronym conventionally assigned to each MSP;
<model> is the unique name of the model to which the AMC refers to;
<N> is a progressive integer number (base 1).

Model name convention:
A model is uniquely identified by its name (among the models of the same MSP). It is than responsibility of the MSP to give a unique name to each model provided. This same name will be used by CSNDC to specify the model to run. Name can be any string containing characters in the set [0-9][a-z][A-Z]. No space nor underscore characters are allowed.

2.8 Users

2.8.1 EIF-15: Warning and alerts from PDE

Warning and alerts generated from PDE shall be delivered as:

- PDF attachments in e-mail messages (please find an example in Annex - R)SMS text messages (not used)
- MMS messages with text and image content (not used)
- Voice messages by phone

Templates of possible messages for each of the above cases are reported in Annex K.

2.8.2 EIF-16: Systematic products from PDE

The protocol to be used is the SFTP in push mode.
The PDE has to provide one or more packages at the time. Supported package file formats are:

- .zip
- .tar
- .tgz

Each package represent a systematic product delivery for a specific EO data.

Following table reports the content of a package.

Product delivered	Package Content	File format	Description	Multiplicity	Mandatory/ Optional
EO product	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "EO_PRODUCT"	1	M
	EO Native Image file	L1b native formats	Level 1b EO product. In case of RADARSAT 1 and RADARSAT 2 this file is the zip file containing a directory with a name corresponding to the one of the zip file itself. This directory contains all files of the product including a metadata xml file named "product.xml" (please note that this is compliant with RADARSAT product specifications).	1	M
	EO Product metadata GML file	XML as per EOP schema	The EOP application profile compliant metadata description of the EO product	1	M
	EO browse image file	JPG	Browse image file	1	O

	Image quality notification	XML as per schema in Annex E	Suitability of product (YES or NOT) and position accuracy/displacement vector, 1 per SAR image.	1	M
	Not Analysable area mask	Geotiff file	Image file representing Not Analyzable pixels of the image (any other pixel shall be set to transparent color code or valorised to pure black).	1	O
Detected Oil Spill	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "OS_NOTIFICATION"	1	M
	Oil Spill feature GML file	XML as per schema in Annex C	A file describing a detected OS.	N	M
	Clip image file	JPG or Tiff	A clip image file to be associated to a given OS.	N	O
Oil Spill evolution	Package info XML file	XML as per schema in Annex B	A file describing the content of the package and stating the type of package as "OS_NOTIFICATION"	1	M
	Oil Spill feature GML file	XML as per schema in Annex C	A file describing a predicted OS for each time step in the evolution.	N	M

Table 2-4 Systematic product delivery package content for EIF16

2.9 External Catalogues

2.9.1 EIF-17: EO data search from DAM

The protocols to be used for searches on external catalogues are:

- OGC CSW version 2.0.2 implementing ebRIM extension package for EO Product
- OGC WCS version 1.1.0

Supported service requests for CSW protocol shall be:

- *GetCapabilities*
- *GetRecords*
- *DescribeRecord*
- *GetRepositoryItem*

More specifically, the *GetRecords* operation has to be used to browse and identify an EO product of interest. It shall returns the ebRIM representation of the catalogue item while the *GetRepositoryItem* operation has to return the GML file EOP compliant (eop namespace) of the full EO product metadata.

Supported service requests for WCS protocol shall be:

- *GetCapabilities*
- *GetCoverage*
- *DescribeCoverage*

The identifier of a given EO product as it is reported in CSW *GetRecords* response shall be used to retrieve the product through WCS *GetCoverage* request.

2.10 Event Notification Service

CSNDC provides and event notification service function. This service generates an event notification message when data of the following type are ingested into CSNDC:

- EO scene
- Oil spills
- Detected vessels

The message is sent to a Sensor Event Service (SES), not managed by the CSNDC, but reachable by the CSNDC. The task of the SES should be to proxy the messages received from CSNDC to the subscribers of the SES. CSNDC will simply send the event notification messages, to the SES URL configured in the CSNDC configuration files.
The messages are sent via a SOAP protocol and the specification follows the SES standard, which in turn is based on the specification O&M 1.0.1.

3 XSD SCHEMAS COMMON NOTES

This section contains indications that are common to any of the xsd schemas contained in the annexes of this document.

3.1 XML document encoding

Any schema presented here is assumed to be encoded as UTF-8. Any XML document to be used in the CSN DC interfaces is assumed to be encoded as UTF-8.
Any XML document used in this EICD shall be syntactically correct and shall follow the XML domain best-practices and common rules. In particular:

- XML documents shall validate against the appropriate XML schema definition (CSN-DC specific schemas are published by EMSA on http://www.emsa.europa.eu/schemas/csndc/ and its subdirectories).
- XML namespaces have to be declared using the reserved XML pseudo-attribute `xmlns`, the value of which must be a valid namespace name with a prefix.
  Please note: the namespace prefix shall always be explicitly used (default namespace or namespace undeclaration shall not be used).

3.2 Version of GML

The xsd schemas presented in this document (see annexes A, B, C, D, E, F, J) are directly or indirectly leveraging GML language version 3.1.1.

3.3 Coordinate Reference system in GML elements

GML elements that are indirectly or directly using gml:_Geometry object allow for the specification of a coordinate reference system through the attribute 'srsName'. As stated in GML specs "In general this reference points to a CRS instance of gml:CoordinateReferenceSystemType […]. For well known references it is not required that the CRS description exists at the location the URI points to. If no srsName attribute is given, the CRS must be specified as part of the larger context this geometry element is part of, e.g. a geometric element like point, curve, etc. It is expected that this attribute will be specified at the direct position level only in rare cases."

In the scope of CSN DC, it is recommended to use 'EPSG:4326'.

3.4 Date and time

If not differently and explicitly written, all date and time elements have to be expressed as UTC in a ISO 8601 compliant format such as: **2010-06-03T20:35:25Z** or **2010-06-03T20:35:25.000Z** etc
As usual with date and time representations, omitting the 'T' separator is also allowed (e.g. **2010-06-03 20:35:25Z**).
Unfortunately the ISO 8601 profile has some ambiguities that CSN-DC needs to fix:

- The profile does not specify how many digits may be used to represent the decimal fraction of a second. For the purpose of CSN-DC the maximum number of digits for the decimal part of a second is set to 5.
- The profile does not prevent to indicate the UTC zone with '+00:00' instead of 'Z' (e.g. 2003-04-01T13:01:02+00:00).

4 Annex A –Vessel Traffic Information Feature GML schema

Schema STIRES_WFS.xsd

attribute form default:
element form default: **qualified**
targetNamespace: **http://www.emsa.europa.eu/ais**

Elements	Complex types
beam	**FeatureType**
bearing	**ObjectStatusType**
courseOverGround	**TrackPropertyType**
dataSource	**TrackType**
draught	
expectedTimeOfArrival	
feature	
heading	
length	
MMSI	
navigationalStatus	
objectStatus	
rateOfTurn	
speedOverGround	
time	
track	
trackProperty	

element **beam**

diagram	
namespace	**http://www.emsa.europa.eu/ais**
type	**xsd:decimal**
properties	content simple
annotation	documentation In meters
source	<xsd:element name="beam" type="xsd:decimal"> <xsd:annotation> <xsd:documentation>In meters</xsd:documentation> </xsd:annotation> </xsd:element>

element **bearing**

diagram	bearing In decimal deegrees of angle
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation In decimal deegrees of angle
source	<xsd:element name="bearing" type="xsd:decimal"> <xsd:annotation> <xsd:documentation>In decimal deegrees of angle</xsd:documentation> </xsd:annotation> </xsd:element>

element **courseOverGround**

diagram	courseOverGround In decimal deegrees of angle
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation In decimal deegrees of angle
source	<xsd:element name="courseOverGround" type="xsd:decimal"> <xsd:annotation> <xsd:documentation>In decimal deegrees of angle</xsd:documentation> </xsd:annotation> </xsd:element>

element **dataSource**

diagram	dataSource Organizational source of data for the object of which this element is a member, used at several levels and may represent a data service provider, a data management sys., an AIS transmission sys., etc.
namespace	http://www.emsa.europa.eu/ais
type	**xsd:string**
properties	content simple
annotation	documentation Organizational source of data for the object of which this element is a member, used at several levels and may represent a

	data service provider, a data management sys., an AIS transmission sys., etc.
source	<xsd:element name="dataSource" type="xsd:string"> <xsd:annotation> <xsd:documentation>Organizational source of data for the object of which this element is a member, used at several levels and may represent a data service provider, a data management sys., an AIS transmission sys., etc.</xsd:documentation> </xsd:annotation> </xsd:element>

element **draught**

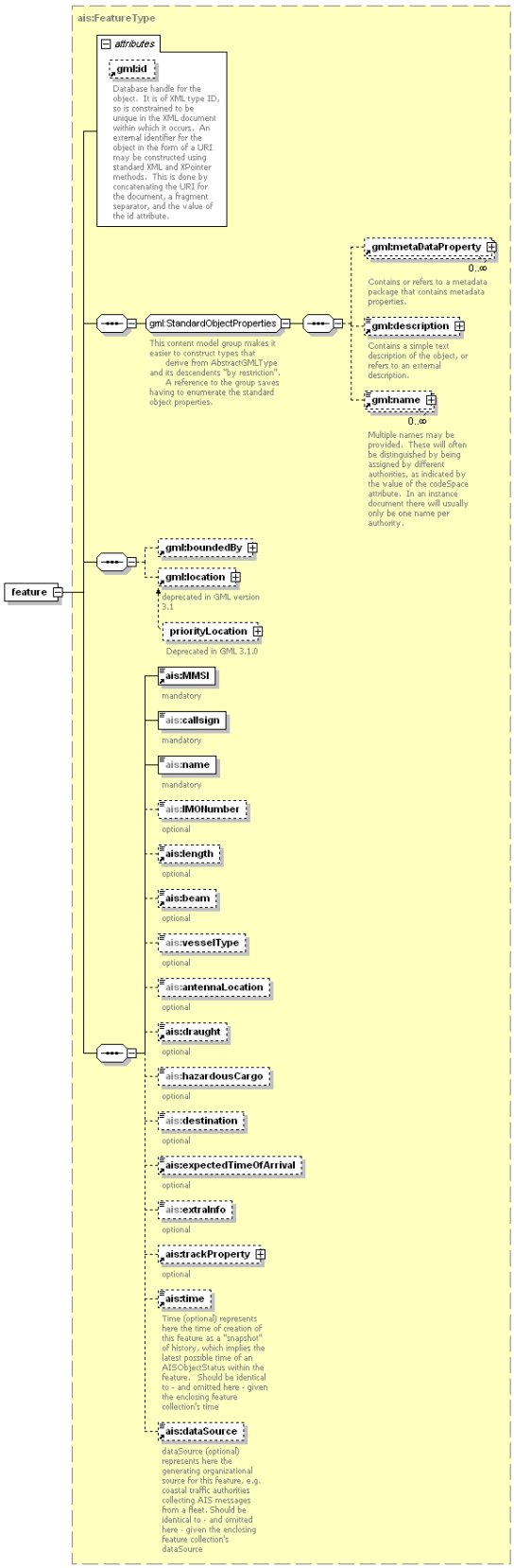
diagram	
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation In meters
source	<xsd:element name="draught" type="xsd:decimal"> <xsd:annotation> <xsd:documentation>In meters</xsd:documentation> </xsd:annotation> </xsd:element>

element **expectedTimeOfArrival**

diagram	
namespace	http://www.emsa.europa.eu/ais
type	**xsd:dateTime**
properties	content simple
annotation	documentation Allways in UTC timeframe (YYYY-MM-DDThh:mm:ss)
source	<xsd:element name="expectedTimeOfArrival" type="xsd:dateTime"> <xsd:annotation> <xsd:documentation>Allways in UTC timeframe (YYYY-MM-DDThh:mm:ss)</xsd:documentation> </xsd:annotation> </xsd:element>

element **feature**

diagram



namespace	http://www.emsa.europa.eu/ais
type	**ais:FeatureType**
properties	content complex substGrp gml:_Feature

children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location ais:MMSI ais:callsign ais:name ais:IMONumber ais:length ais:beam ais:vesselType ais:antennaLocation ais:draught ais:hazardousCargo ais:destination ais:expectedTimeOfArrival ais:extraInfo ais:trackProperty ais:time ais:dataSource**
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation: Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
source	`<xsd:element name="feature" type="ais:FeatureType" substitutionGroup="gml:_Feature"/>`

element **heading**

diagram	heading In decimal deegrees of angle
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation In decimal deegrees of angle

source	`<xsd:element name="heading" type="xsd:decimal">`
	`<xsd:annotation>`
	`<xsd:documentation>In decimal deegrees of angle</xsd:documentation>`
	`</xsd:annotation>`

	</xsd:element>

element **length**

diagram	length In meters
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation In meters
source	<xsd:element name="length" type="xsd:decimal"> <xsd:annotation> <xsd:documentation>In meters</xsd:documentation> </xsd:annotation> </xsd:element>

element **MMSI**

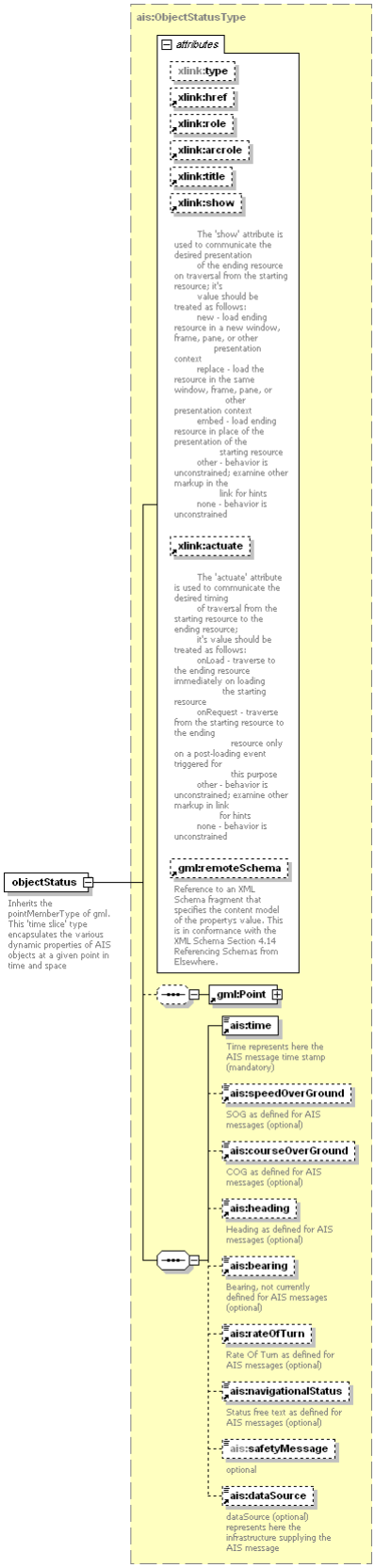
diagram	MMSI Vessel Identification according to the IMO AIS standards
namespace	http://www.emsa.europa.eu/ais
type	**xsd:string**
properties	content simple
annotation	documentation Vessel Identification according to the IMO AIS standards
source	<xsd:element name="MMSI" type="xsd:string"> <xsd:annotation> <xsd:documentation>Vessel Identification according to the IMO AIS standards</xsd:documentation> </xsd:annotation> </xsd:element>

element **navigationalStatus**

diagram	navigationalStatus Free text
namespace	http://www.emsa.europa.eu/ais
type	**xsd:string**
properties	content simple
annotation	documentation Free text

source	<xsd:element name="navigationalStatus" type="xsd:string"> <xsd:annotation> <xsd:documentation>Free text</xsd:documentation> </xsd:annotation> </xsd:element>

element **objectStatus**

diagram	
namespace	http://www.emsa.europa.eu/ais
type	**ais:ObjectStatusType**
properties	content complex

	substGrp gml:pointProperty
children	**gml:Point** **ais:time** **ais:speedOverGround** **ais:courseOverGround** **ais:heading** **ais:bearing** **ais:rateOfTurn** **ais:navigationalStatus** **ais:safetyMessage** **ais:dataSource**
attributes	

Name	Type	Use	Default	Fixed	annotation
xlink:type	**xsd:string**			simple	
href		optional			
role		optional			
arcrole		optional			
title		optional			
show		optional			documentation The 'show' attribute is used to communicate the desired presentation of the ending resource on traversal from the starting resource; it's value should be treated as follows: new - load ending resource in a new window, frame, pane, or other presentation context replace - load the resource in the same window, frame, pane, or other presentation context embed - load ending resource in place of the presentation of the starting

			resource other - behavior is unconstrained; examine other markup in the link for hints none - behavior is unconstrained
	actuate	optional	documentation The 'actuate' attribute is used to communicate the desired timing of traversal from the starting resource to the ending resource; it's value should be treated as follows: onLoad - traverse to the ending resource immediately on loading the starting resource onRequest - traverse from the starting resource to the ending resource only on a post-loading event triggered for this purpose other -

	behavior is unconstrained; examine other markup in link for hints none - behavior is unconstrained remoteSchema optional documentation Reference to an XML Schema fragment that specifies the content model of the propertys value. This is in conformance with the XML Schema Section 4.14 Referencing Schemas from Elsewhere.
annotation	documentation Inherits the pointMemberType of gml. This 'time slice' type encapsulates the various dynamic properties of AIS objects at a given point in time and space
source	<xsd:element name="objectStatus" type="ais:ObjectStatusType" substitutionGroup="gml:pointProperty"> <xsd:annotation> <xsd:documentation>Inherits the pointMemberType of gml. This 'time slice' type encapsulates the various dynamic properties of AIS objects at a given point in time and space</xsd:documentation> </xsd:annotation> </xsd:element>

element **rateOfTurn**

diagram	
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation Units as defined for IMO AIS ?
source	<xsd:element name="rateOfTurn" type="xsd:decimal"> <xsd:annotation>

	<xsd:documentation>Units as defined for IMO AIS ?</xsd:documentation> </xsd:annotation> </xsd:element>

element **speedOverGround**

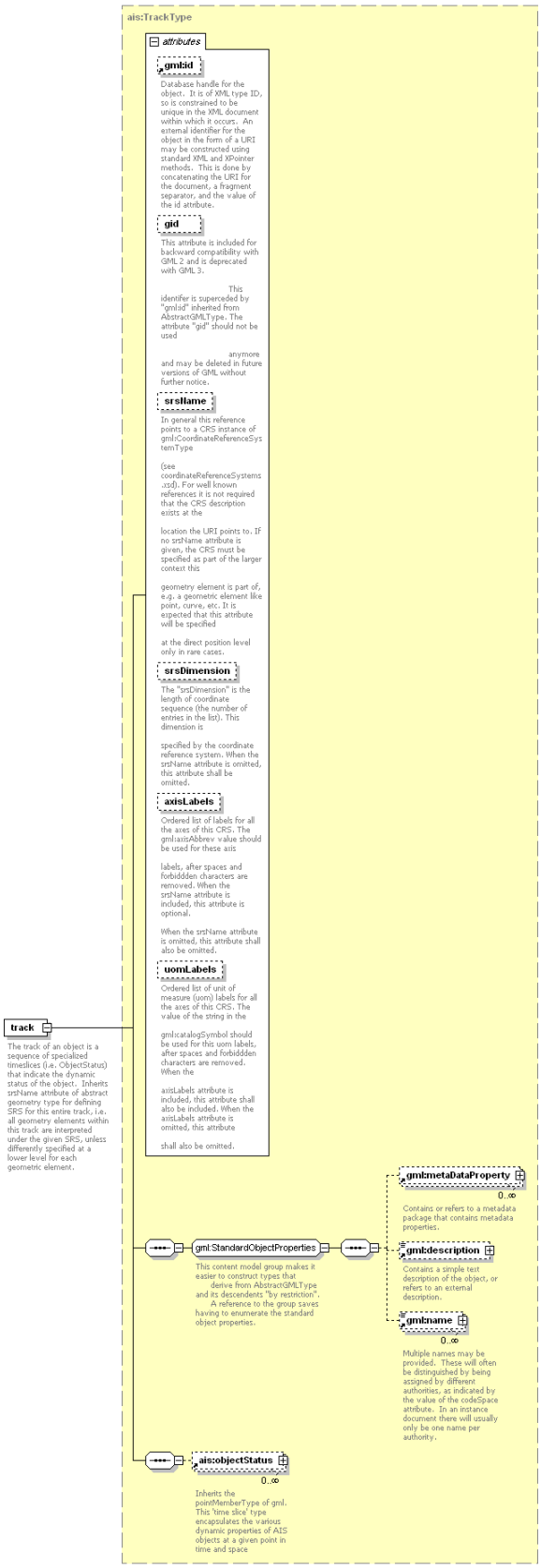
diagram	
namespace	http://www.emsa.europa.eu/ais
type	**xsd:decimal**
properties	content simple
annotation	documentation In knots
source	<xsd:element name="speedOverGround" type="xsd:decimal"> <xsd:annotation> <xsd:documentation>In knots</xsd:documentation> </xsd:annotation> </xsd:element>

element **time**

diagram	
namespace	http://www.emsa.europa.eu/ais
type	**xsd:dateTime**
properties	content simple
annotation	documentation Allways in UTC timeframe (YYYY-MM-DDThh:mm:ss)
source	<xsd:element name="time" type="xsd:dateTime"> <xsd:annotation> <xsd:documentation>Allways in UTC timeframe (YYYY-MM-DDThh:mm:ss)</xsd:documentation> </xsd:annotation> </xsd:element>

element **track**

diagram

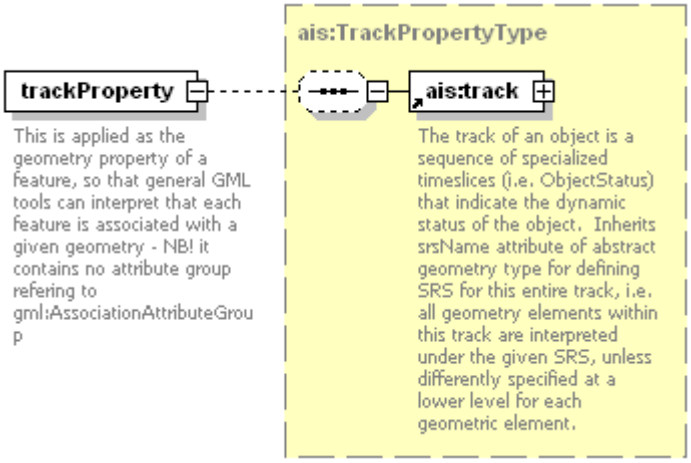


namespace	http://www.emsa.europa.eu/ais
type	**ais:TrackType**
properties	content complex

	substGrp gml:_GeometricAggregate
children	**gml:metaDataProperty gml:description gml:name ais:objectStatus**
attributes	Name / Type / Use / Default / Fixed / annotation
	id — optional — documentation: Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
	gid — **xsd:string** — optional — documentation: This attribute is included for backward compatibility with GML 2 and is deprecated with GML 3. This identifer is superceded by "gml:id" inherited from AbstractGMLType. The attribute "gid" should not be used anymore and may be deleted in future versions of GML without further notice.
	srsName — **xsd:anyURI** — optional — documentation: In general this reference points to a CRS instance of gml:CoordinateReferenceSystemType (see coordinateReferenceSystems.xsd). For well known references it is not required that the CRS description exists at the location the URI points to. If no srsName attribute is given, the CRS must be specified as part of the larger context this geometry element is part of, e.g. a geometric element like point, curve, etc. It is expected that this attribute will be specified at the direct position level only in rare cases.
	srsDimension — **xsd:positiveInteger** — optional — documentation: The "srsDimension" is the length of

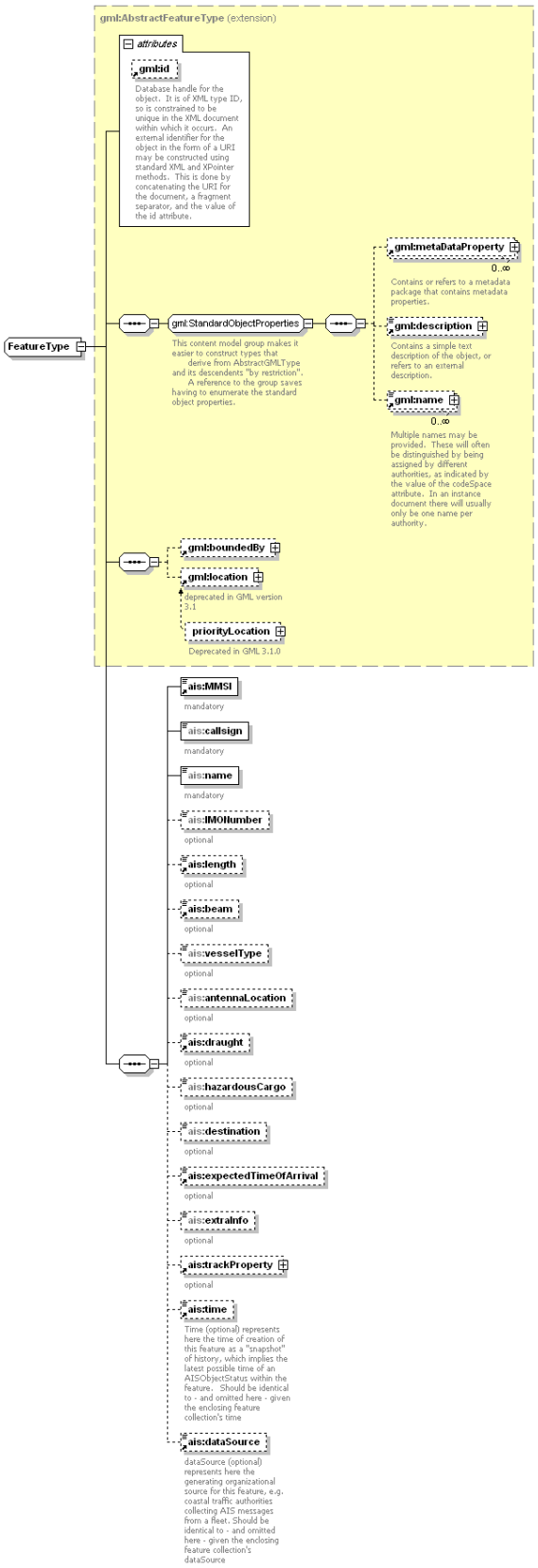
				coordinate sequence (the number of entries in the list). This dimension is specified by the coordinate reference system. When the srsName attribute is omitted, this attribute shall be omitted.
	axisLabels	**gml:NCNameList**	optional	documentation Ordered list of labels for all the axes of this CRS. The gml:axisAbbrev value should be used for these axis labels, after spaces and forbiddden characters are removed. When the srsName attribute is included, this attribute is optional. When the srsName attribute is omitted, this attribute shall also be omitted.
	uomLabels	**gml:NCNameList**	optional	documentation Ordered list of unit of measure (uom) labels for all the axes of this CRS. The value of the string in the gml:catalogSymbol should be used for this uom labels, after spaces and forbiddden characters are removed. When the axisLabels attribute is included, this attribute shall also be included. When the axisLabels attribute is omitted, this attribute shall also be omitted.
annotation	documentation The track of an object is a sequence of specialized timeslices (i.e. ObjectStatus) that indicate the dynamic status of the object. Inherits srsName attribute of abstract geometry type for defining SRS for this entire track, i.e. all geometry elements within this track are interpreted under the given SRS, unless differently specified at a lower level for each geometric element.			
source	<xsd:element name="track" type="ais:TrackType" substitutionGroup="gml:_GeometricAggregate"> <xsd:annotation> <xsd:documentation>The track of an object is a sequence of specialized timeslices (i.e. ObjectStatus) that indicate the dynamic status of the object. Inherits srsName attribute of abstract geometry type for defining SRS for this entire track, i.e. all geometry elements within this track are interpreted under the given SRS, unless differently specified at a lower level for each geometric element.</xsd:documentation> </xsd:annotation> </xsd:element>			

element **trackProperty**

diagram	
namespace	http://www.emsa.europa.eu/ais
type	**ais:TrackPropertyType**
properties	content complex
children	**ais:track**
annotation	documentation This is applied as the geometry property of a feature, so that general GML tools can interpret that each feature is associated with a given geometry - NB! it contains no attribute group refering to gml:AssociationAttributeGroup
source	<xsd:element name="trackProperty" type="ais:TrackPropertyType"> <xsd:annotation> <xsd:documentation>This is applied as the geometry property of a feature, so that general GML tools can interpret that each feature is associated with a given geometry - NB! it contains no attribute group refering to gml:AssociationAttributeGroup</xsd:documentation> </xsd:annotation> </xsd:element>

complexType **FeatureType**

diagram



namespace	http://www.emsa.europa.eu/ais
type	extension of **gml:AbstractFeatureType**
properties	base gml:AbstractFeatureType

children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location ais:MMSI ais:callsign ais:name ais:IMONumber ais:length ais:beam ais:vesselType ais:antennaLocation ais:draught ais:hazardousCargo ais:destination ais:expectedTimeOfArrival ais:extraInfo ais:trackProperty ais:time ais:dataSource**
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation: Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.

source

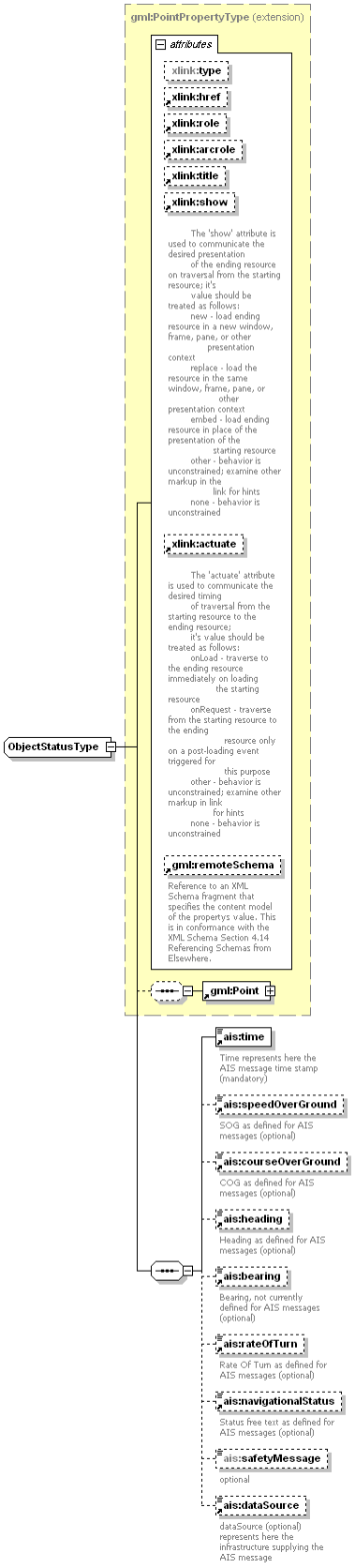
```
<xsd:complexType name="FeatureType">
 <xsd:complexContent>
  <xsd:extension base="gml:AbstractFeatureType">
   <xsd:sequence>
    <!-- mandatory static AIS properties -->
    <xsd:element ref="ais:MMSI">
     <xsd:annotation>
      <xsd:documentation>mandatory</xsd:documentation>
     </xsd:annotation>
    </xsd:element>
    <xsd:element name="callsign" type="xsd:string">
     <xsd:annotation>
      <xsd:documentation>mandatory</xsd:documentation>
     </xsd:annotation>
    </xsd:element>
    <xsd:element name="name" type="xsd:string">
     <xsd:annotation>
      <xsd:documentation>mandatory</xsd:documentation>
     </xsd:annotation>
```

```
</xsd:element>
<!-- optional static AIS properties -->
<xsd:element name="IMONumber" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element ref="ais:length" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element ref="ais:beam" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="vesselType" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="antennaLocation" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<!-- optional voyage related AIS properties-->
<xsd:element ref="ais:draught" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="hazardousCargo" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="destination" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element ref="ais:expectedTimeOfArrival" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="extraInfo" type="xsd:string" minOccurs="0">
  <xsd:annotation>
    <xsd:documentation>optional</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<!-- optional dynamic AIS properties - i.e. the track info -->
```

```
      <xsd:element ref="ais:trackProperty" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>optional</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <!-- optional origin of feature properties -->
      <xsd:element ref="ais:time" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>Time (optional) represents here the time of creation of this feature as a
"snapshot" of history, which implies the latest possible time of an AISObjectStatus within the feature.
           Should be identical to - and omitted here - given the enclosing feature collection's
time</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element ref="ais:dataSource" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>dataSource (optional)  represents here the generating organizational
source for this feature, e.g. coastal traffic authorities collecting AIS messages from a fleet. Should be
identical to - and omitted here - given the enclosing feature collection's
dataSource</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
    </xsd:sequence>
  </xsd:extension>
 </xsd:complexContent>
</xsd:complexType>
```

complexType **ObjectStatusType**

diagram



namespace	http://www.emsa.europa.eu/ais
type	extension of **gml:PointPropertyType**

properties	base gml:PointPropertyType
children	**gml:Point** **ais:time** **ais:speedOverGround** **ais:courseOverGround** **ais:heading** **ais:bearing** **ais:rateOfTurn** **ais:navigationalStatus** **ais:safetyMessage** **ais:dataSource**
attributes	

Name	Type	Use	Default	Fixed	annotation
xlink:type	**xsd:string**			simple	
href		optional			
role		optional			
arcrole		optional			
title		optional			
show		optional			documentation The 'show' attribute is used to communicate the desired presentation of the ending resource on traversal from the starting resource; it's value should be treated as follows: new - load ending resource in a new window, frame, pane, or other presentation context replace - load the resource in the same window, frame, pane, or other presentation context embed - load ending resource in place of the presentation of the starting

			resource other - behavior is unconstrained; examine other markup in the link for hints none - behavior is unconstrained
	actuate	optional	documentation The 'actuate' attribute is used to communicate the desired timing of traversal from the starting resource to the ending resource; it's value should be treated as follows: onLoad - traverse to the ending resource immediately on loading the starting resource onRequest - traverse from the starting resource to the ending resource only on a post-loading event triggered for this purpose other -

			behavior is unconstrained; examine other markup in link for hints none - behavior is unconstrained
	remoteSchema	optional	documentation Reference to an XML Schema fragment that specifies the content model of the propertys value. This is in conformance with the XML Schema Section 4.14 Referencing Schemas from Elsewhere.

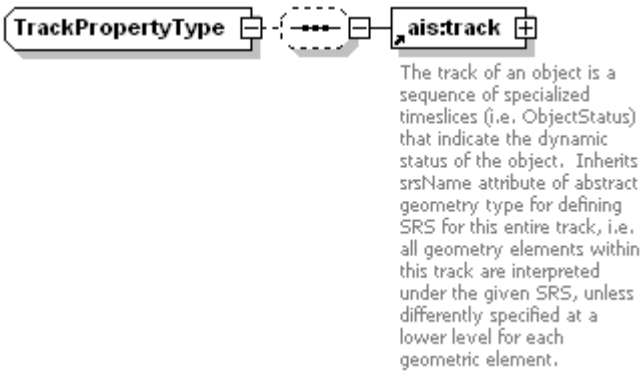
source

```
<xsd:complexType name="ObjectStatusType">
 <xsd:complexContent>
  <xsd:extension base="gml:PointPropertyType">
   <xsd:sequence>
    <xsd:element ref="ais:time">
     <xsd:annotation>
      <xsd:documentation>Time represents here the AIS message time stamp
(mandatory)</xsd:documentation>
     </xsd:annotation>
    </xsd:element>
    <xsd:element ref="ais:speedOverGround" minOccurs="0">
     <xsd:annotation>
      <xsd:documentation>SOG as defined for AIS messages (optional)</xsd:documentation>
     </xsd:annotation>
    </xsd:element>
    <xsd:element ref="ais:courseOverGround" minOccurs="0">
     <xsd:annotation>
      <xsd:documentation>COG as defined for AIS messages (optional)</xsd:documentation>
     </xsd:annotation>
    </xsd:element>
    <xsd:element ref="ais:heading" minOccurs="0">
     <xsd:annotation>
      <xsd:documentation>Heading as defined for AIS messages (optional)</xsd:documentation>
     </xsd:annotation>
    </xsd:element>
    <xsd:element ref="ais:bearing" minOccurs="0">
     <xsd:annotation>
```

```
          <xsd:documentation>Bearing, not currently defined for AIS messages
(optional)</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element ref="ais:rateOfTurn" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>Rate Of Turn as defined for AIS messages
(optional)</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element ref="ais:navigationalStatus" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>Status free text as defined for AIS messages
(optional)</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="safetyMessage" type="xsd:string" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>optional</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element ref="ais:dataSource" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation>dataSource (optional) represents here the infrastructure supplying the AIS
message</xsd:documentation>
        </xsd:annotation>
      </xsd:element>
    </xsd:sequence>
  </xsd:extension>
 </xsd:complexContent>
</xsd:complexType>
```

complexType **TrackPropertyType**

diagram



namespace	http://www.emsa.europa.eu/ais
children	**ais:track**

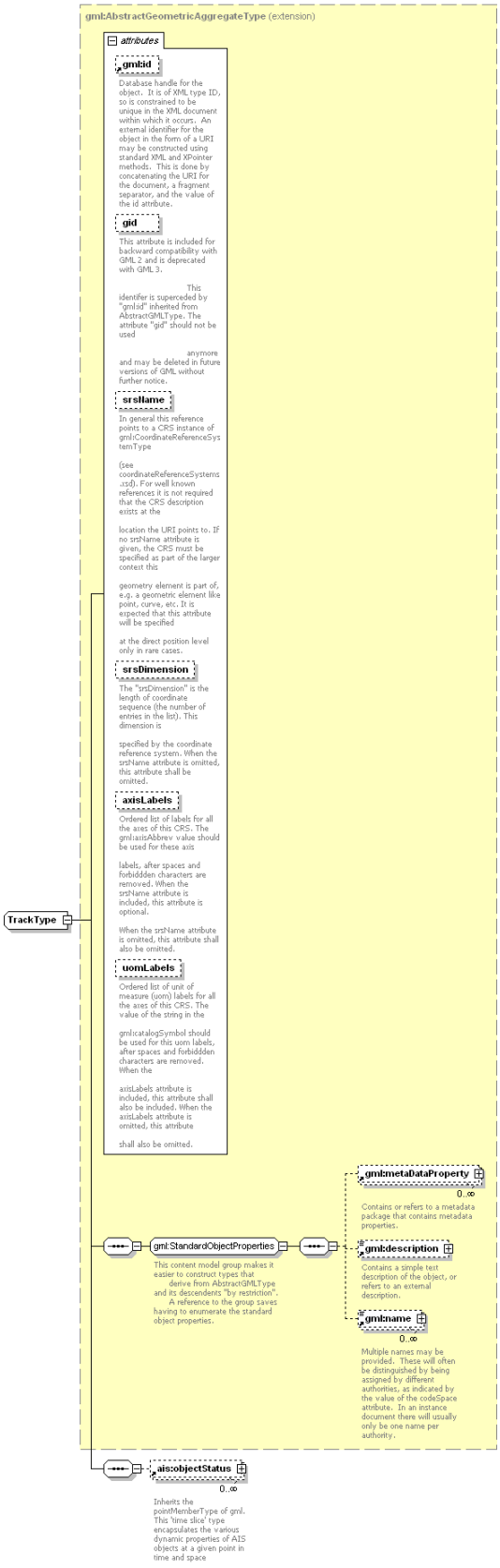
source

```
<xsd:complexType name="TrackPropertyType">
 <xsd:sequence minOccurs="0">
  <xsd:element ref="ais:track"/>
 </xsd:sequence>
```

	</xsd:complexType>

complexType **TrackType**

diagram



namespace	http://www.emsa.europa.eu/ais
type	extension of **gml:AbstractGeometricAggregateType**
properties	base gml:AbstractGeometricAggregateType
children	**gml:metaDataProperty gml:description gml:name ais:objectStatus**
attributes	

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
gid	**xsd:string**	optional			documentation This attribute is included for backward compatibility with GML 2 and is deprecated with GML 3. This identifer is superceded by "gml:id" inherited from AbstractGMLType. The attribute "gid" should not be used anymore and may be deleted in future versions of GML without further notice.
srsName	**xsd:anyURI**	optional			documentation In general this reference points to a CRS instance of gml:CoordinateReferenceSystemType (see coordinateReferenceSystems.xsd). For well known references it is not required that the CRS description exists at the location the URI points to. If no srsName attribute is given, the CRS must be specified as part of the larger context this geometry element is part of, e.g. a geometric element like point, curve, etc. It is expected that this attribute will be specified at the direct position level

				only in rare cases.
	srsDimension	**xsd:positiveInteger**	optional	documentation The "srsDimension" is the length of coordinate sequence (the number of entries in the list). This dimension is specified by the coordinate reference system. When the srsName attribute is omitted, this attribute shall be omitted.
	axisLabels	**gml:NCNameList**	optional	documentation Ordered list of labels for all the axes of this CRS. The gml:axisAbbrev value should be used for these axis labels, after spaces and forbiddden characters are removed. When the srsName attribute is included, this attribute is optional. When the srsName attribute is omitted, this attribute shall also be omitted.
	uomLabels	**gml:NCNameList**	optional	documentation Ordered list of unit of measure (uom) labels for all the axes of this CRS. The value of the string in the gml:catalogSymbol should be used for this uom labels, after spaces and forbiddden characters are removed. When the axisLabels attribute is included, this attribute shall also be included. When the axisLabels attribute is omitted, this attribute shall also be omitted.

source

```
<xsd:complexType name="TrackType">
 <xsd:complexContent>
  <xsd:extension base="gml:AbstractGeometricAggregateType">
   <xsd:sequence>
    <xsd:element ref="ais:objectStatus" minOccurs="0" maxOccurs="unbounded"/>
   </xsd:sequence>
  </xsd:extension>
 </xsd:complexContent>
</xsd:complexType>
```

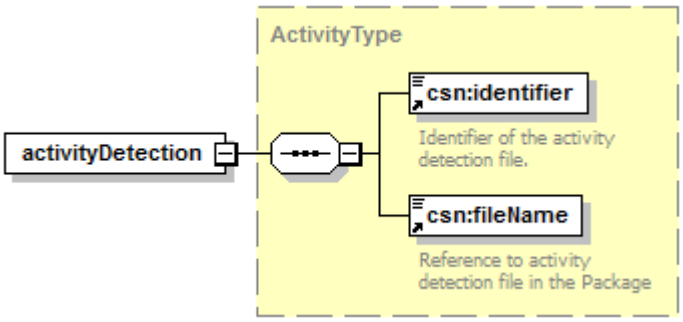
5 Annex B – Package Info XML schema

Schema csndc_pkg.xsd

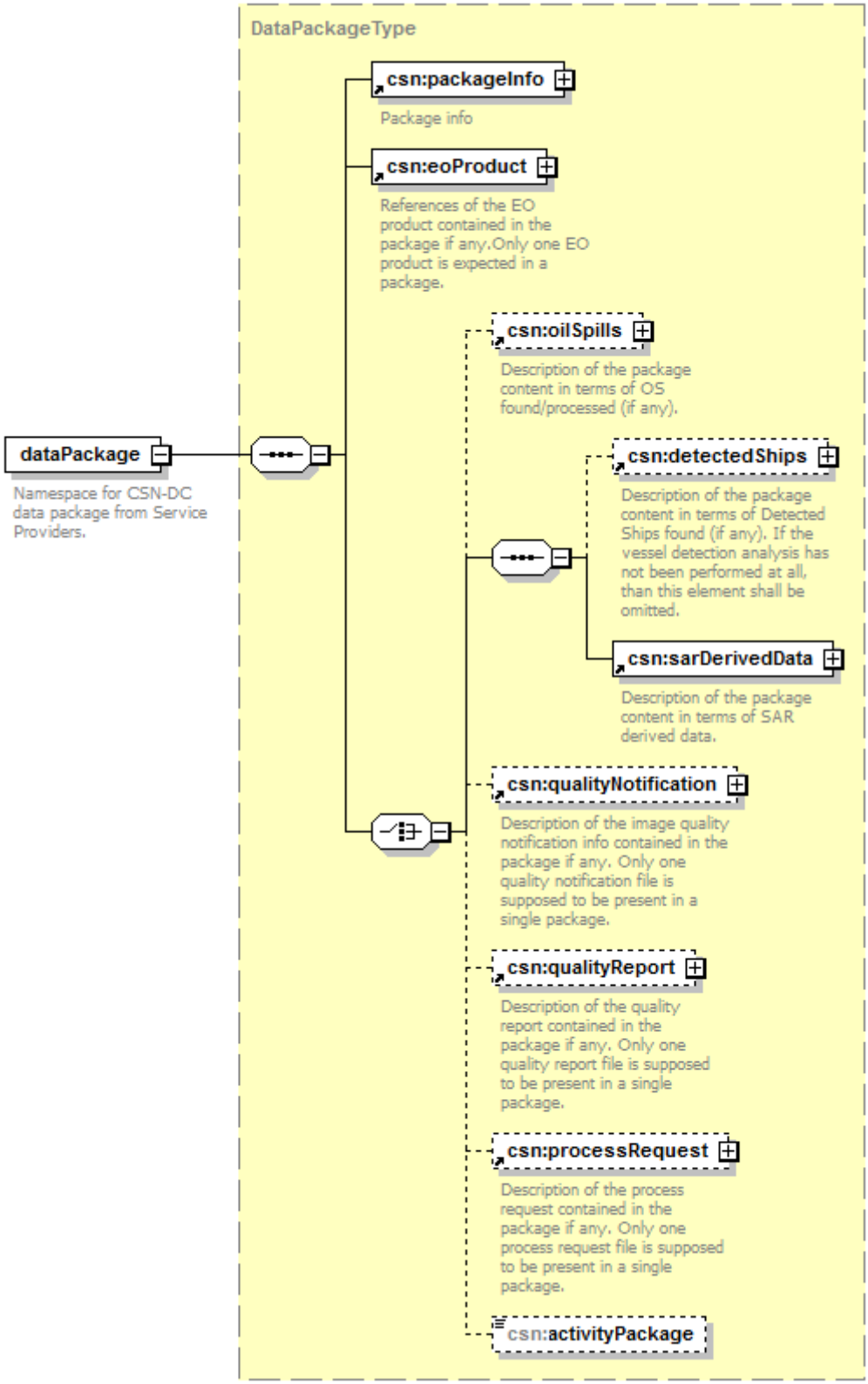
attribute form default: **unqualified**
element form default: **qualified**
targetNamespace: **http://www.emsa.europa.eu/csndc**

Elements	Complex types	Simple types
activityDetection	ActivityType	SARDerivedFeatureType
centerTrajectory	CenterTrajectoryType	
dataPackage	DataPackageType	
detectedShipReference	DetectedShipReferenceType	
detectedShips	DetectedShipsType	
eopReference	EOPReferenceType	
eoProduct	EOProductType	
fileName	OilSpillReferenceType	
identifier	OilSpillsType	
oilSpillReference	PackageInfoType	
oilSpills	ProcessRequestType	
packageInfo	QualityType	
processRequest	SARDerivedDataReferenceType	
qualityNotification	SARDerivedDataType	
qualityReport		
sarDerivedData		
sarDerivedDataReference		

element **activityDetection**

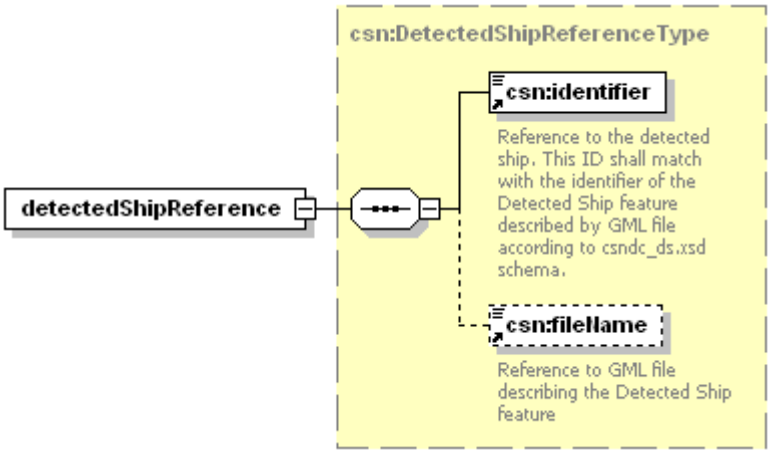
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:ActivityType
properties	content complex
children	csn:identifier csn:fileName
source	<xs:element name="activityDetection" type="csn:ActivityType"/>

element **dataPackage**

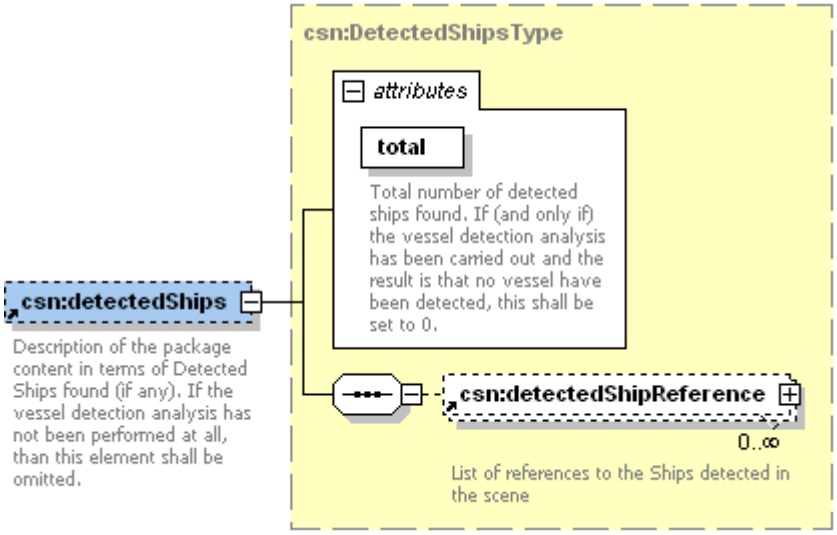
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:DataPackageType
properties	content complex
children	csn:packageInfo csn:eoProduct csn:oilSpills csn:detectedShips csn:sarDerivedData

	csn:qualityNotification csn:qualityReport csn:processRequest csn:activityPackage
annotation	documentation Namespace for CSN-DC data package from Service Providers.
source	<xs:element name="dataPackage" type="csn:DataPackageType"> <xs:annotation> <xs:documentation>Namespace for CSN-DC data package from Service Providers.</xs:documentation> </xs:annotation> </xs:element>

element **detectedShipReference**

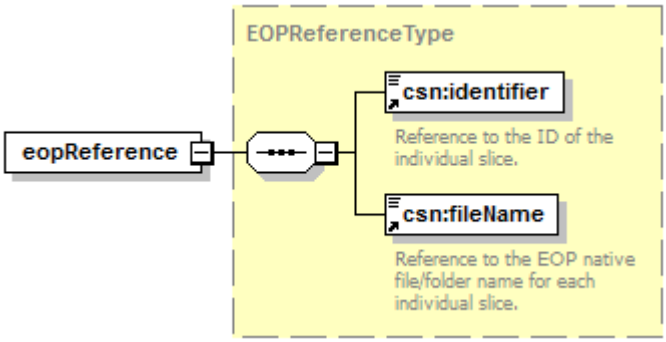
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:DetectedShipReferenceType**
properties	content complex
children	**csn:identifier** **csn:fileName**
source	<xs:element name="detectedShipReference" type="csn:DetectedShipReferenceType"/>

element **detectedShips**

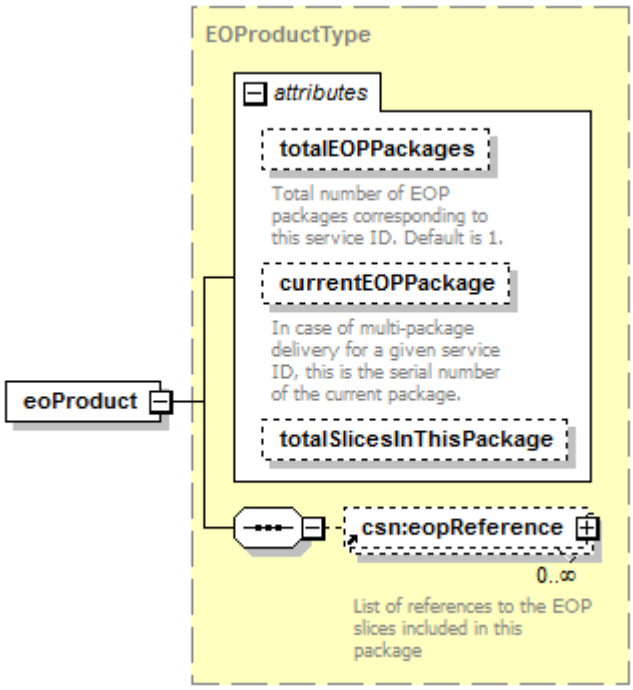
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:DetectedShipsType**
properties	content complex
children	**csn:detectedShipReference**
attributes	Name: total; Type: **xs:integer**; Use: required; Default; Fixed; annotation: documentation: Total number of detected ships found. If (and only if) the vessel detection analysis has been carried out and the result is that no vessel have been detected, this shall be set to 0.
source	<xs:element name="detectedShips" type="csn:DetectedShipsType"/>

element **eopReference**

diagram	

	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:EOPReferenceType**
properties	content complex
children	**csn:identifier** **csn:fileName**
source	<xs:element name="eopReference" type="csn:EOPReferenceType"/>

element **eoProduct**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:EOProductType**
properties	content complex
children	**csn:eopReference**
attributes	Name / Type / Use / Default / Fixed / annotation serviceID — required totalEOPPackages totalSlicesInThisPackage

source	<xs:element name="eoProduct" type="csn:EOProductType"/>

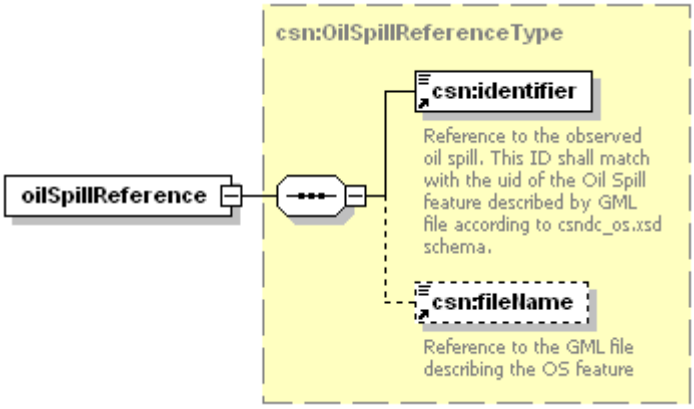
element **fileName**

diagram	fileName Reference to filename in the Package
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
properties	content simple
annotation	documentation Reference to filename in the Package. This has to be the EOP metadata GML file name.
source	<xs:element name="fileName"> <xs:annotation> <xs:documentation>Reference to filename in the Package</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"/> </xs:simpleType> </xs:element>

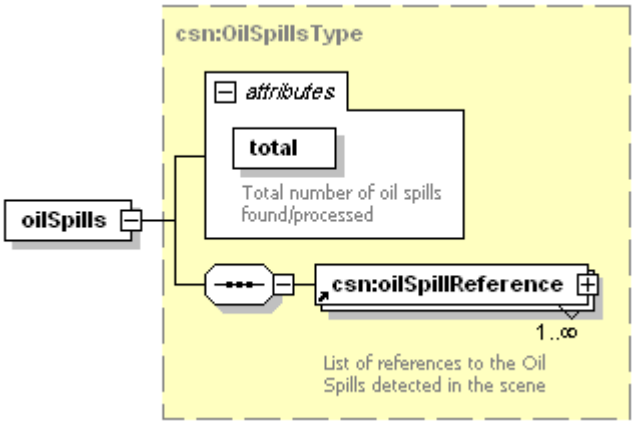
element **identifier**

diagram	identifier Identifier for metadata item
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
properties	content simple
annotation	documentation Identifier for metadata item
source	<xs:element name="identifier"> <xs:annotation> <xs:documentation>Identifier for metadata item</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"/> </xs:simpleType> </xs:element>

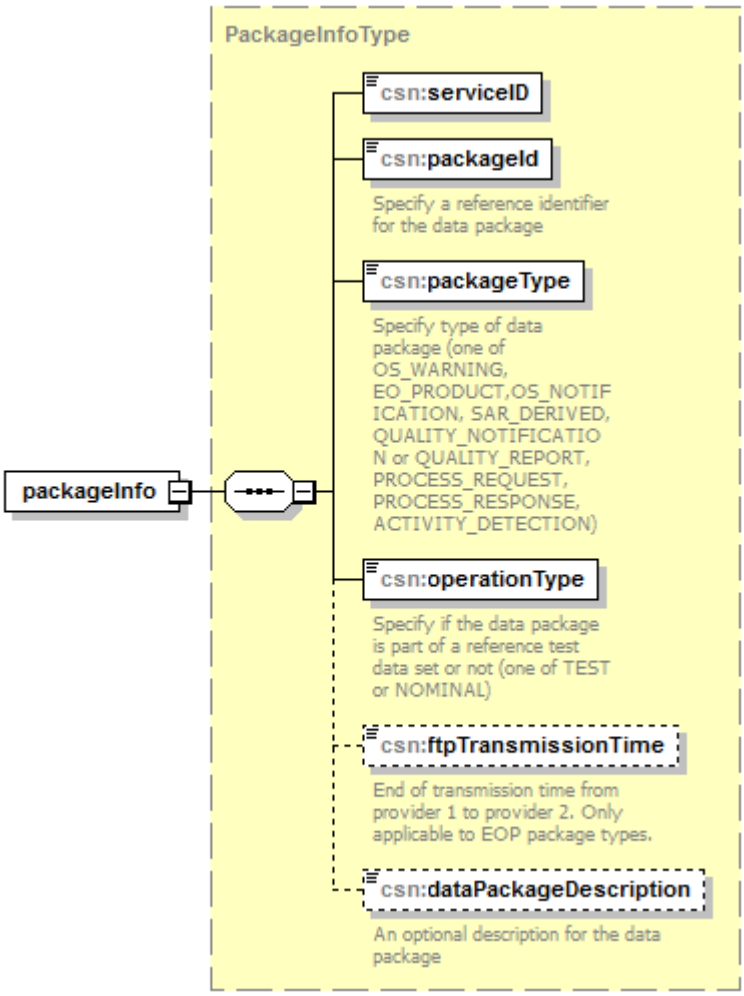
element **oilSpillReference**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:OilSpillReferenceType**
properties	content complex
children	**csn:identifier** **csn:fileName**
source	<xs:element name="oilSpillReference" type="csn:OilSpillReferenceType"/>

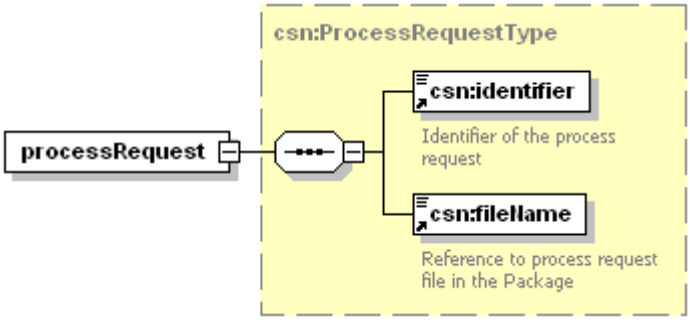
element **oilSpills**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:OilSpillsType**
properties	content complex
children	**csn:oilSpillReference**
attributes	Name: total; Type: **xs:integer**; Use: required; Default; Fixed; annotation: documentation: Total number of oil spills found/processed
source	<xs:element name="oilSpills" type="csn:OilSpillsType"/>

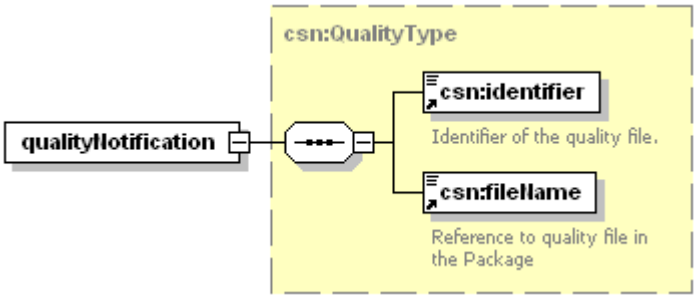
element **packageInfo**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:PackageInfoType**
properties	content complex
children	**csn:packageId csn:packageType csn:operationType csn:dataPackageDescription**
source	<xs:element name="packageInfo" type="csn:PackageInfoType"/>

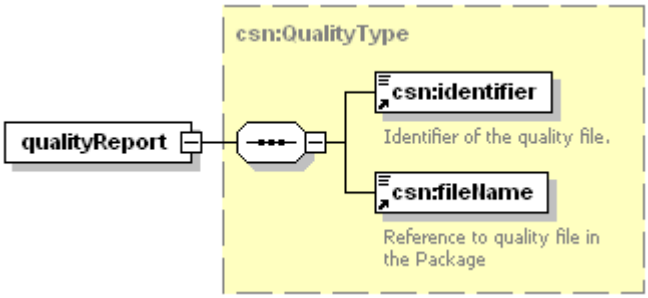
element **processRequest**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:ProcessRequestType**
properties	content complex
children	**csn:identifier** **csn:fileName**
source	<xs:element name="processRequest" type="csn:ProcessRequestType"/>

element **qualityNotification**

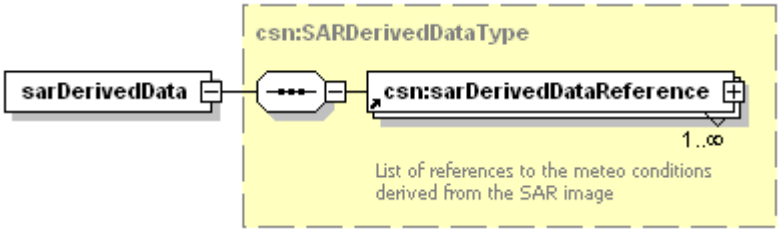
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:QualityType**
properties	content complex
children	**csn:identifier** **csn:fileName**
source	<xs:element name="qualityNotification" type="csn:QualityType"/>

element **qualityReport**

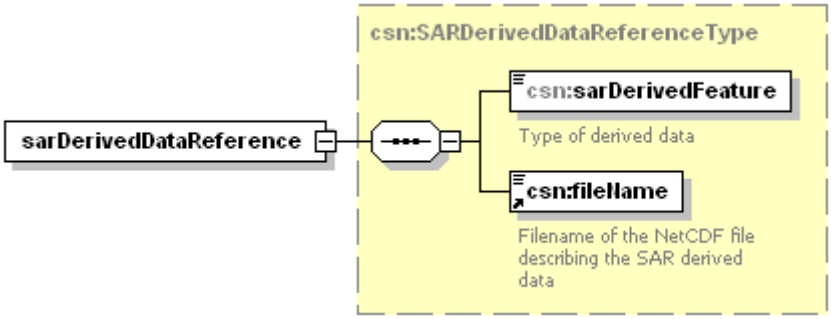
diagram	
namespace	http://www.emsa.europa.eu/csndc

type	csn:QualityType
properties	content complex
children	csn:identifier csn:fileName
source	<xs:element name="qualityReport" type="csn:QualityType"/>

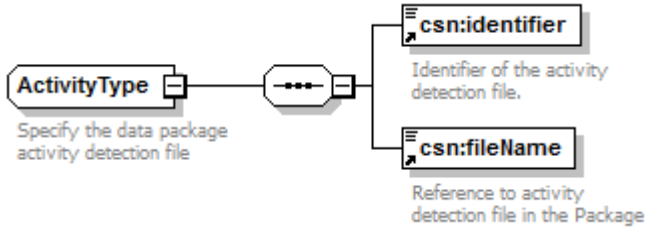
element **sarDerivedData**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:SARDerivedDataType
properties	content complex
children	csn:sarDerivedDataReference
source	<xs:element name="sarDerivedData" type="csn:SARDerivedDataType"/>

element **sarDerivedDataReference**

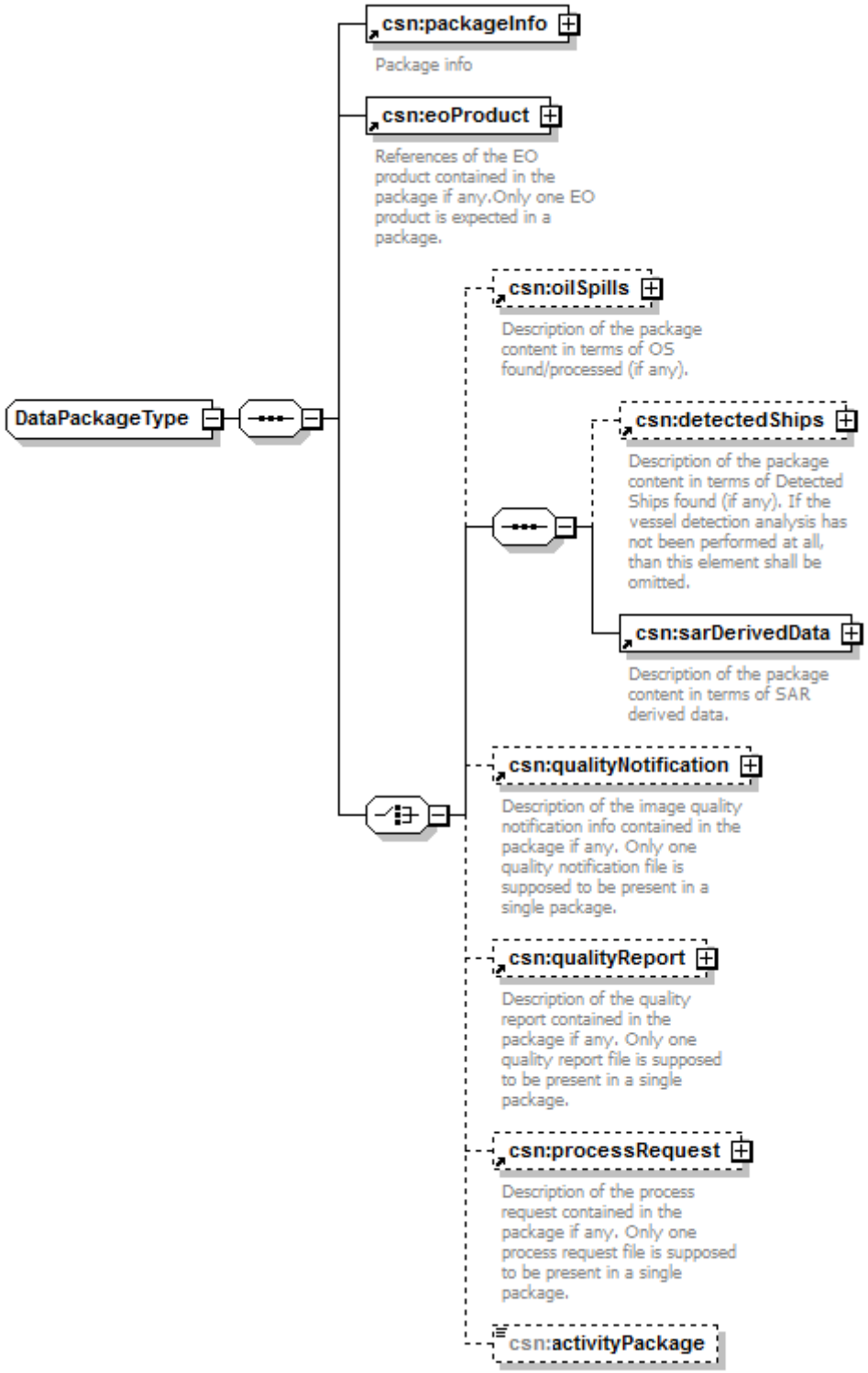
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:SARDerivedDataReferenceType
properties	content complex
children	**csn:sarDerivedFeature** csn:fileName
source	<xs:element name="sarDerivedDataReference" type="csn:SARDerivedDataReferenceType"/>

complexType **ActivityType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:identifier** **csn:fileName**
annotation	documentation Specify the data package activity detection file
source	<xs:complexType name="ActivityType"> <xs:annotation> <xs:documentation>Specify the data package activity detection file</xs:documentation> </xs:annotation> <xs:sequence> <xs:element ref="csn:identifier"> <xs:annotation> <xs:documentation>Identifier of the activity detection file. </xs:documentation> </xs:annotation> </xs:element> <xs:element ref="csn:fileName"> <xs:annotation> <xs:documentation>Reference to activity detection file in the Package</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

complexType **DataPackageType**

diagram

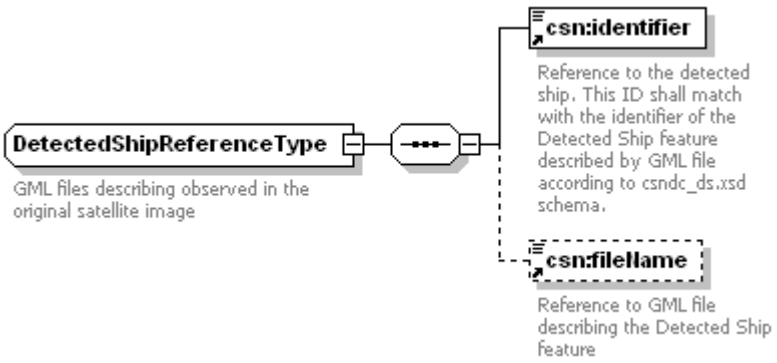


namespace	http://www.emsa.europa.eu/csndc
children	csn:packageInfo csn:eoProduct csn:oilSpills csn:detectedShips csn:sarDerivedData csn:qualityNotification csn:qualityReport csn:processRequest csn:activityPackage
source	<xs:complexType name="DataPackageType"> <xs:sequence> <xs:element ref="csn:packageInfo">

```
      <xs:annotation>
        <xs:documentation>Package info</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="csn:eoProduct">
      <xs:annotation>
        <xs:documentation>References of the EO product contained in the package if
any.Only one EO product is expected in a package.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:choice>
      <xs:element ref="csn:oilSpills" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Description of the package content in terms of OS
found/processed (if any).</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:sequence>
        <xs:element ref="csn:detectedShips" minOccurs="0">
          <xs:annotation>
            <xs:documentation>Description of the package content in terms of Detected
Ships found (if any). If the vessel detection analysis has not been performed at all,
than this element shall be omitted.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element ref="csn:sarDerivedData">
          <xs:annotation>
            <xs:documentation>Description of the package content in terms of SAR
derived data.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
      <xs:element ref="csn:qualityNotification" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Description of the image quality notification info
contained in the package if any. Only one quality notification file is supposed to be
present in a single package.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element ref="csn:qualityReport" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Description of the quality report contained in the package
if any. Only one quality report file is supposed to be present in a single
package.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element ref="csn:processRequest" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Description of the process request contained in the
package if any. Only one process request file is supposed to be present in a single
package.</xs:documentation>
```

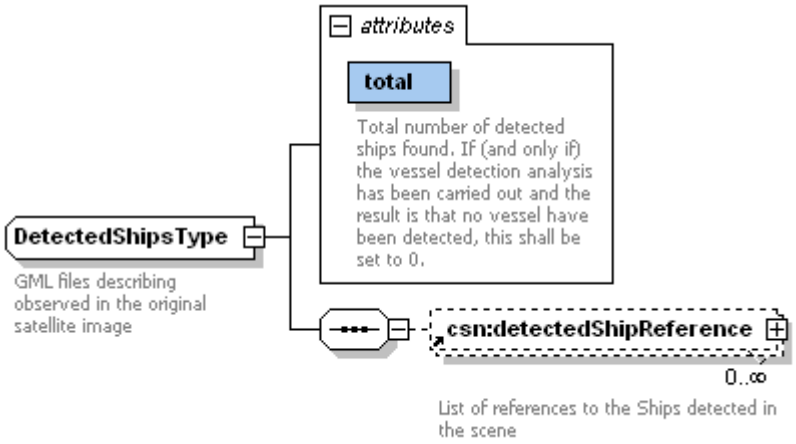
	<xs:annotation> <xs:element> <xs:element name="activityPackage" minOccurs="0"/> <xs:choice> <xs:sequence> <xs:complexType>

complexType **DetectedShipReferenceType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:identifier** **csn:fileName**
annotation	documentation GML files describing observed in the original satellite image
source	<xs:complexType name="DetectedShipReferenceType"> <xs:annotation> <xs:documentation>GML files describing observed in the original satellite image</xs:documentation> </xs:annotation> <xs:sequence> <xs:element ref="csn:identifier"> <xs:annotation> <xs:documentation>Reference to the detected ship. This ID shall match with the identifier of the Detected Ship feature described by GML file according to csndc_ds.xsd schema.</xs:documentation> </xs:annotation> </xs:element> <xs:element ref="csn:fileName" minOccurs="0"> <xs:annotation> <xs:documentation>Reference to GML file describing the Detected Ship feature</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

complexType **DetectedShipsType**

diagram



namespace	http://www.emsa.europa.eu/csndc
children	**csn:detectedShipReference**

attributes

Name	Type	Use	Default	Fixed	annotation
total	**xs:integer**	required			documentation Total number of detected ships found.

annotation

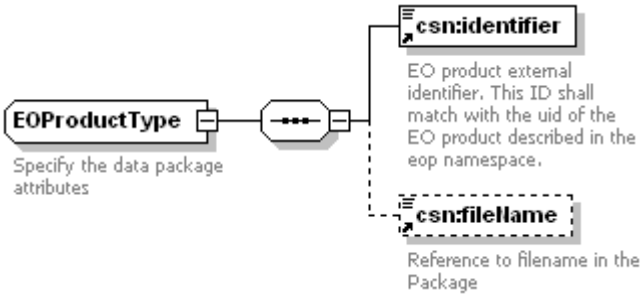
documentation

GML files describing observed in the original satellite image

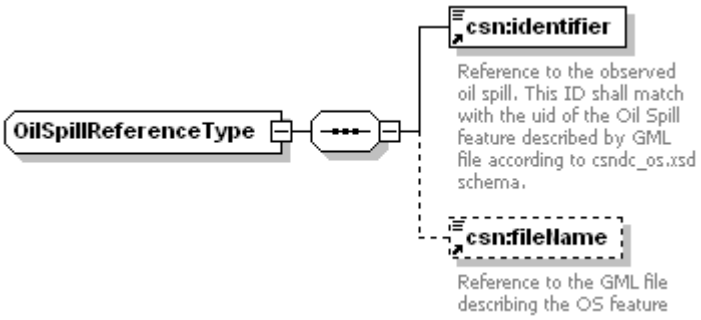
source

```
<xs:complexType name="DetectedShipsType">
  <xs:annotation>
    <xs:documentation>GML files describing observed in the original satellite image</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element ref="csn:detectedShipReference" minOccurs="0" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>List of references to the Ships detected in the scene</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="total" type="xs:integer" use="required">
    <xs:annotation>
      <xs:documentation> Total number of detected ships found. If (and only if) the vessel detection
analysis has been carried out and the result is that no vessel have been detected, this shall be set to
0.</xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

complexType **EOProductType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:identifier** **csn:fileName**
annotation	documentation Specify the data package attributes
source	<xs:complexType name="EOProductType"> <xs:annotation> <xs:documentation>Specify the data package attributes</xs:documentation> </xs:annotation> <xs:sequence> <xs:element ref="csn:identifier"> <xs:annotation> <xs:documentation>EO product external identifier. This ID shall match with the uid of the EO product described in the eop namespace.</xs:documentation> </xs:annotation> </xs:element> <xs:element ref="csn:fileName" minOccurs="0"/> </xs:sequence> </xs:complexType>

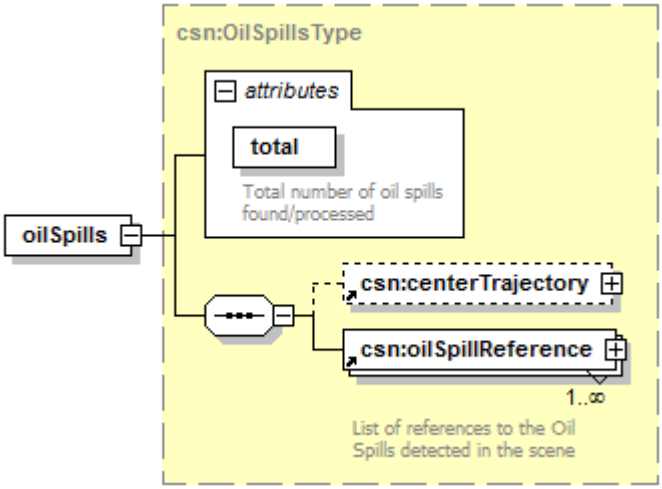
complexType **OilSpillReferenceType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:identifier** **csn:fileName**
source	<xs:complexType name="OilSpillReferenceType">\ <xs:sequence> <xs:element ref="csn:identifier"> <xs:annotation> <xs:documentation>Reference to the observed oil spill. This ID shall match with the uid of the Oil Spill feature described by GML file according to csndc_os.xsd schema.</xs:documentation> </xs:annotation>

```
    </xs:element>
    <xs:element ref="csn:fileName" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Reference to the GML file describing the OS feature</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

complexType **OilSpillsType**

diagram



namespace: http://www.emsa.europa.eu/csndc

children: **csn:oilSpillReference**

attributes

Name	Type	Use	Default	Fixed	annotation
total	**xs:integer**	required			documentation Total number of oil spills found/processed

annotation

documentation

Describes main results of the Oil Spill Analysis performed on the scene

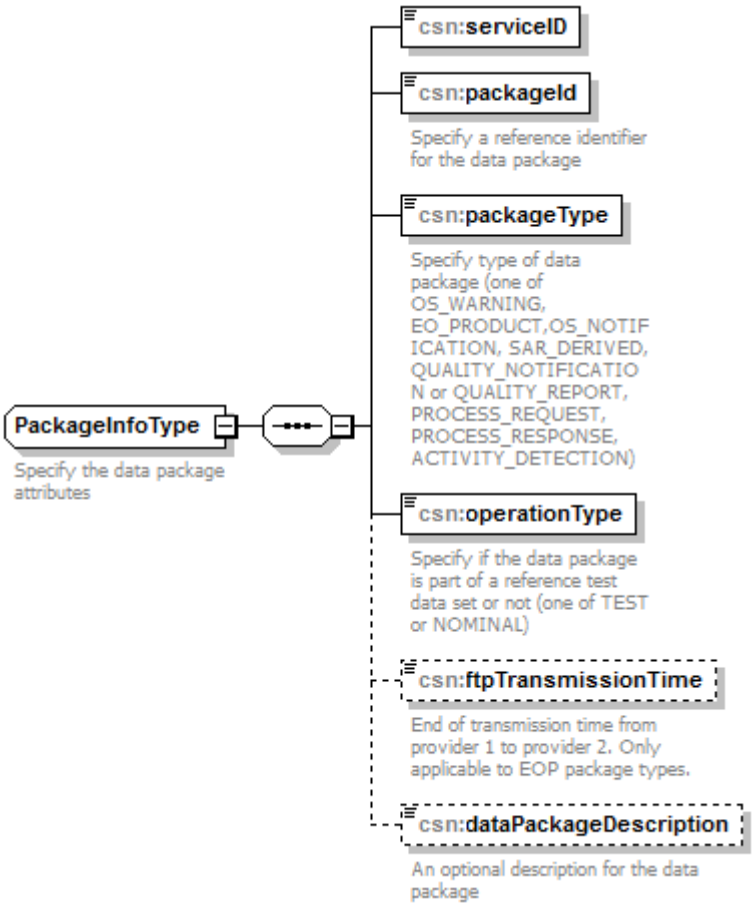
source

```
<xs:complexType name="OilSpillsType">
  <xs:annotation>
    <xs:documentation>Describes main results of the Oil Spill Analysis performed on the
scene</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element ref="csn:centerTrajectory" minOccurs="0"/>
    <xs:element ref="csn:oilSpillReference" maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation>List of references to the Oil Spills detected in the scene</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="total" type="xs:integer" use="required">
    <xs:annotation>
      <xs:documentation>Total number of oil spills found/processed</xs:documentation>
```

```
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
```

complexType **PackageInfoType**

diagram



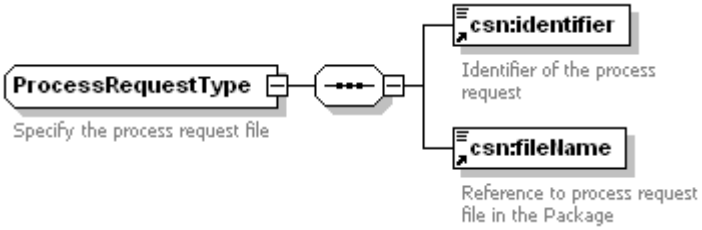
namespace	http://www.emsa.europa.eu/csndc
children	**csn:packageId csn:packageType csn:operationType csn:dataPackageDescription**
annotation	documentation Specify the data package attributes

source

```
<xs:complexType name="PackageInfoType">
  <xs:annotation>
    <xs:documentation>Specify the data package attributes</xs:documentation>
  </xs:annotation>
  <xs:sequence>
<xs:element name="serviceID" type="xs:integer"/>
    <xs:element name="packageId" type="xs:string">
      <xs:annotation>
        <xs:documentation>Specify a reference identifier for the data package</xs:documentation>
      </xs:annotation>
    </xs:element>
```

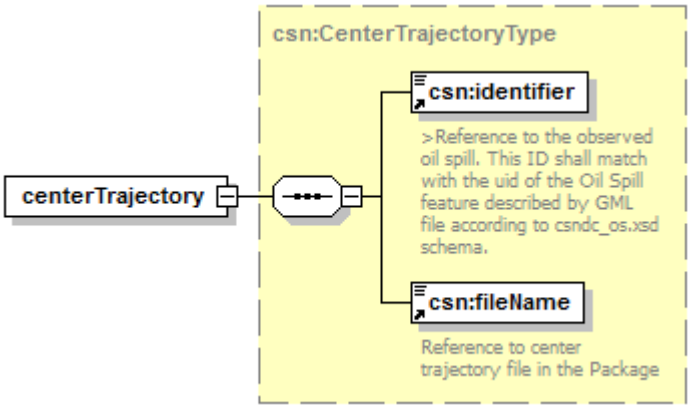
```
  <xs:element name="packageType">
    <xs:annotation>
      <xs:documentation>Specify type of data package (one of OS_WARNING,
EO_PRODUCT,OS_NOTIFICATION, SAR_DERIVED, QUALITY_NOTIFICATION,
QUALITY_REPORT, PROCESS_REQUEST,PROCESS_RESPONSE, ACTIVITY
DETECTION)</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="OS_WARNING"/>
        <xs:enumeration value="EO_PRODUCT"/>
        <xs:enumeration value="OS_NOTIFICATION"/>
        <xs:enumeration value="SAR_DERIVED"/>
        <xs:enumeration value="QUALITY_NOTIFICATION"/>
        <xs:enumeration value="QUALITY_REPORT"/>
        <xs:enumeration value="PROCESS_REQUEST"/>
        <xs:enumeration value="PROCESS_RESPONSE"/>
        <xs:enumeration value="ACTIVITY_DETECTION"/>

      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="operationType">
    <xs:annotation>
      <xs:documentation>Specify if the data package is part of a reference test data set or not (one of
TEST or NOMINAL)</xs:documentation>
    </xs:annotation>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="TEST"/>
        <xs:enumeration value="NOMINAL"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="ftpTransmissionTime" type="xs:dateTime" minOccurs="0">
        <xs:annotation>
                <xs:documentation>End of transmission time from provider 1 to provider 2. Only
applicable to EOP package types. </xs:documentation>
        </xs:annotation>
</xs:element>
  <xs:element name="dataPackageDescription" type="xs:string" minOccurs="0">
    <xs:annotation>
      <xs:documentation>An optional description for the data package</xs:documentation>
    </xs:annotation>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

complexType **ProcessRequestType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:identifier** **csn:fileName**
annotation	documentation Specify the process request file

source	`<xs:complexType name="ProcessRequestType">`
	`  <xs:annotation>`
	`  <xs:documentation>Specify the process request file</xs:documentation>`
	`  </xs:annotation>`
	`  <xs:sequence>`
	`  <xs:element ref="csn:identifier">`
	`  <xs:annotation>`
	`  <xs:documentation>Identifier of the process request</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  <xs:element ref="csn:fileName">`
	`  <xs:annotation>`
	`  <xs:documentation>Reference to process request file in the Package</xs:documentation>`
	`  </xs:annotation>`
	`  </xs:element>`
	`  </xs:sequence>`
	`</xs:complexType>`

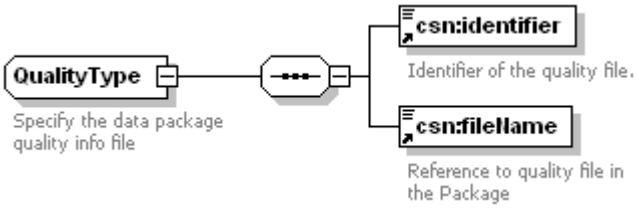
complexType **centreTrajectoryType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:identifier** **csn:fileName**
annotation	documentation Specify the centre trajectory
source	`<xs:element name="centerTrajectory" type="csn:CenterTrajectoryType"/>` `  <xs:complexType name="CenterTrajectoryType">`

```
                <xs:annotation>
                        <xs:documentation>Specify the process request file</xs:documentation>
                </xs:annotation>
                <xs:sequence>
                        <xs:element ref="csn:identifier">
                                <xs:annotation>
                                        <xs:documentation>>Reference to the observed oil spill. This
ID shall match with the uid of the Oil Spill feature described by GML file according to csndc_os.xsd
schema.</xs:documentation>
                                </xs:annotation>
                        </xs:element>
                        <xs:element ref="csn:fileName">
                                <xs:annotation>
                                        <xs:documentation>Reference to center trajectory file in the
Package</xs:documentation>
                                </xs:annotation>
                        </xs:element>
                </xs:sequence>
        </xs:complexType>
```

complexType **QualityType**

diagram



namespace: http://www.emsa.europa.eu/csndc

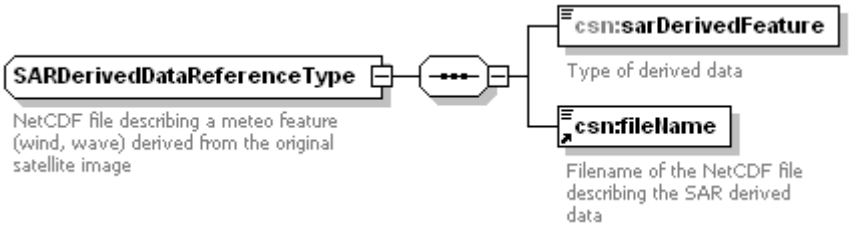
children: **csn:identifier** **csn:fileName**

annotation: documentation
Specify the data package quality info file

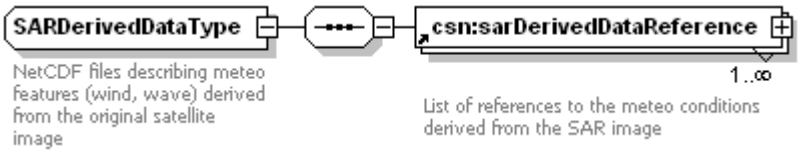
source

```
<xs:complexType name="QualityType">
  <xs:annotation>
    <xs:documentation>Specify the data package quality info file</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element ref="csn:identifier">
      <xs:annotation>
        <xs:documentation>Identifier of the quality file. </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element ref="csn:fileName">
      <xs:annotation>
        <xs:documentation>Reference to quality file in the Package</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

complexType **SARDerivedDataReferenceType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:sarDerivedFeature** **csn:fileName**
annotation	documentation NetCDF file describing a meteo feature (wind, wave) derived from the original satellite image
source	<xs:complexType name="SARDerivedDataReferenceType"> <xs:annotation> <xs:documentation>NetCDF file describing a meteo feature (wind, wave) derived from the original satellite image</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="sarDerivedFeature" type="csn:SARDerivedFeatureType"> <xs:annotation> <xs:documentation>Type of derived data</xs:documentation> </xs:annotation> </xs:element> <xs:element ref="csn:fileName"> <xs:annotation> <xs:documentation>Filename of the NetCDF file describing the SAR derived data</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

complexType **SARDerivedDataType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:sarDerivedDataReference**
annotation	documentation NetCDF files describing meteo features (wind, wave) derived from the original satellite image
source	<xs:complexType name="SARDerivedDataType"> <xs:annotation> <xs:documentation>NetCDF files describing meteo features (wind, wave) derived from the original satellite image</xs:documentation> </xs:annotation> <xs:sequence>

	<xs:element ref="csn:sarDerivedDataReference" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>List of references to the meteo conditions derived from the SAR image</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

simpleType **SARDerivedFeatureType**

namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
facets	enumeration WIND enumeration WAVE
annotation	documentation NetCDF file describing a meteo feature (wind, wave) derived from the original satellite image
source	<xs:simpleType name="SARDerivedFeatureType"> <xs:annotation> <xs:documentation>NetCDF file describing a meteo feature (wind, wave) derived from the original satellite image</xs:documentation> </xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="WIND"/> <xs:enumeration value="WAVE"/> </xs:restriction> </xs:simpleType>

6 Annex C – Oil Spill Feature GML schema

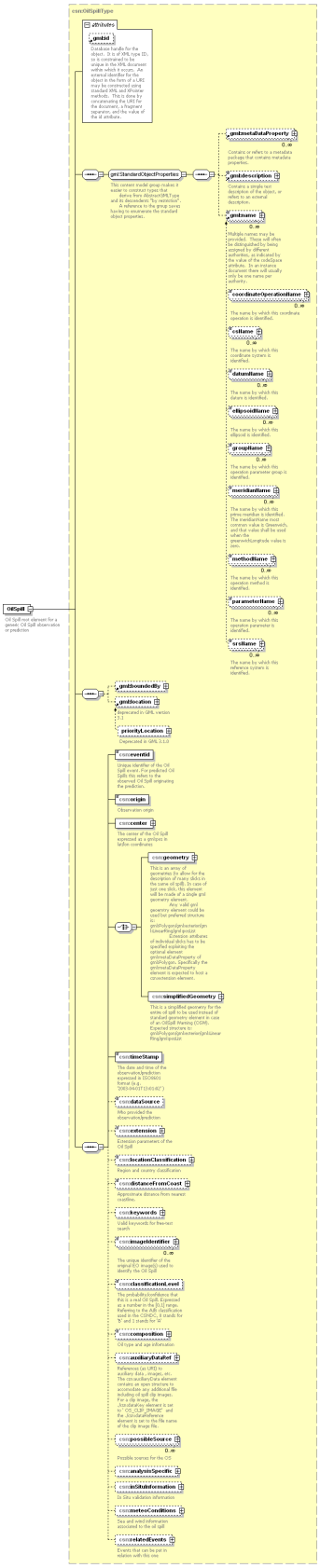
Schema csndc_os.xsd

attribute form default: **unqualified**
element form default: **qualified**
targetNamespace: **http://www.emsa.europa.eu/csndc**

Elements	Complex types	Simple types
OilSpill	AreaType	InSituValidationType
	AuxiliaryDataReferenceArrayType	OriginType
	AuxiliaryDataReferenceType	SensorType
	ImageType	SlickParameterImportanceType
	InSituInformationType	SourceDetectionSensorType
	LengthType	SourceTypeType
	LocationClassificationType	
	MeteoConditionsType	
	OilSpillCompositionType	
	OilSpillExtensionType	
	OilSpillType	
	OrientationType	
	PossibleSourcesType	
	RelatedEventsType	
	SeaConditionType	
	SlickTechParametersType	
	SlickTechParameterType	
	SourceDetectionType	
	SourceIdentificationType	
	SourceIdentityType	
	SourcePositionType	
	WindConditionType	

element **OilSpill**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	csn:OilSpillType
properties	content complex

	substGrp gml:_Feature
children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location csn:eventid csn:origin csn:center csn:geometry csn:timeStamp csn:dataSource csn:extension csn:locationClassification csn:distanceFromCoast csn:keywords csn:imageIdentifier csn:classificationLevel csn:composition csn:auxiliaryDataRef csn:possibleSources csn:analysisSpecific csn:inSituInformation csn:meteoConditions csn:relatedEvents**
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Oil Spill root element for a generic Oil Spill observation or prediction

source	`<xs:element name="OilSpill" type="csn:OilSpillType" substitutionGroup="gml:_Feature">`
	`<xs:annotation>`
	`<xs:documentation>`Oil Spill root element for a generic Oil Spill observation or prediction`</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

element **OilSpill/geometry**

namespace	http://www.emsa.europa.eu/csndc
type	**gml:GeometryArrayPropertyType**
annotation	documentation The polygon describing boundaries of the Oil Spill expressed as one or more gml:Polygon.

This is an array of geometries (to allow for the description of many slicks in the same oil spill). In case of just one slick, this element will be made of a single gml geometry element.

Any valid gml geoemtry element could be used but preferred structure is:
`gml:Polygon/gml:exterior/gml:LinearRing/gml:posList`

All polygons shall be closed (meaning the first point has to be repeated at the end of the list) and drawing segments following the order of the points in the list shall not result in intersecting segments.

The maximum number of vertexes for each polygon shall be < 450 points.

Extension attributes of individual slicks has to be specified exploiting the optional element gml:metaDataProperty of gml:Polygon. Specifically the gml:metaDataProperty element is expected to host a csn:extension element like in the following example:

```
<csn:geometry>
                <gml:Polygon gml:id="slick1">
                        <gml:metaDataProperty>
                                <gml:GenericMetaData>
                                        <csn:extension>
                                          <csn:area uom="m2">324</csn:area>
                                          <csn:length uom="m">61.4</csn:length>
                                          <csn:width uom="m">5.2</csn:width>
                                        </csn:extension>
                                </gml:GenericMetaData>
                        </gml:metaDataProperty>
                        <gml:exterior>
                                <gml:LinearRing>
                                        <gml:posList>41.6032 18.8639 41.6038 18.8637
41.6046 18.8644 41.6053 18.8643 41.606 18.8641 41.6058 18.8632 41.6064 18.8622
41.6032 18.8639</gml:posList>
                                </gml:LinearRing>
                        </gml:exterior>
                </gml:Polygon>
                <gml:Polygon gml:id="slick2">
…
```

element **OilSpill/simplifiedGeometry**

namespace	http://www.emsa.europa.eu/csndc
type	**gml:GeometryArrayPropertyType**
annotation	documentation

This is a simplified geometry for the entire oil spill to be used instead of standard geometry element in case of an OilSpill Warning (OSW).

Expected structure is: `gml:Polygon/gml:exterior/gml:LinearRing/gml:posList`

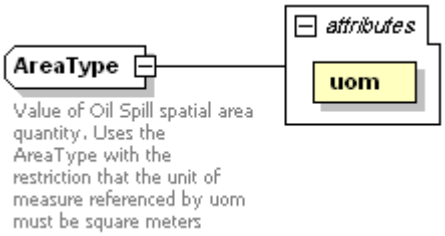
All polygons shall be closed (meaning the first point has to be repeated at the end of the list) and drawing segments following the order of the points in the list shall not result in intersecting segments. The simplified geometry is a simpler version of the detailed geometry of the oil spill (that is reported in the OSN package).

Service Providers are expected to be faster in producing such a simplified geometry for inclusion in the OSW gml file w.r.t. producing the full geometry of the spill specified in the OSN gml file.

```
<csn:simplifiedGeometry>
                <gml:Polygon gml:id="spill">
```

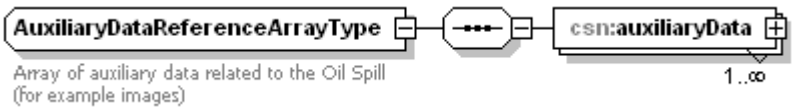
```
                        <gml:exterior>
                                <gml:LinearRing>
                                        <gml:posList>41.6032 18.8639 41.6038 18.8637
41.6046 18.8644 41.6053 18.8643 41.606 18.8641 41.6058 18.8632 41.6064 18.8622
41.6032 18.8639</gml:posList>
                                </gml:LinearRing>
                        </gml:exterior>
                </gml:Polygon>
</csn:simplifiedGeometry>
```

complexType **AreaType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **gml:AreaType**
properties	base gml:AreaType
attributes	Name: uom; Type: **xs:anyURI**; Use: required; Default; Fixed; annotation
annotation	documentation Value of Oil Spill spatial area quantity. Uses the AreaType with the restriction that the unit of measure referenced by uom must be square meters

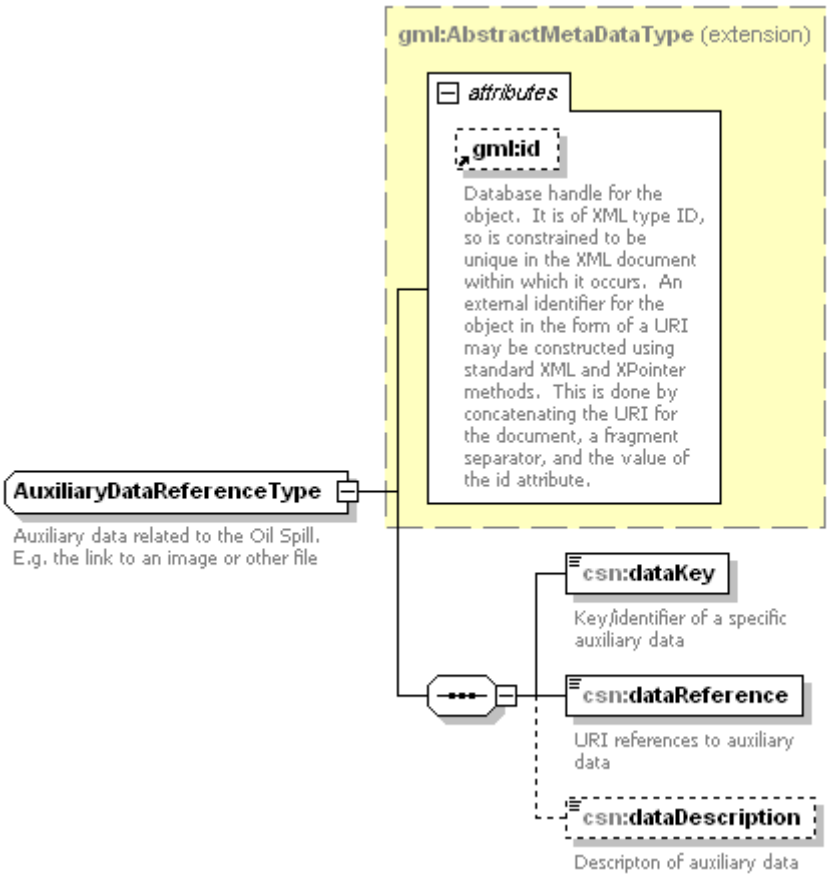
source	`<xs:complexType name="AreaType">`
	`<xs:annotation>`
	`<xs:documentation>`Value of Oil Spill spatial area quantity. Uses the AreaType with the restriction that the unit of measure referenced by uom must be square meters`</xs:documentation>`
	`</xs:annotation>`
	`<xs:simpleContent>`
	`<xs:restriction base="gml:AreaType"/>`
	`</xs:simpleContent>`
	`</xs:complexType>`

complexType **AuxiliaryDataReferenceArrayType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:auxiliaryData**
annotation	documentation Array of auxiliary data related to the Oil Spill (for example images)

source	<xs:complexType name="AuxiliaryDataReferenceArrayType"> <xs:annotation> <xs:documentation>Array of auxiliary data related to the Oil Spill (for example images) </xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="auxiliaryData" type="csn:AuxiliaryDataReferenceType" maxOccurs="unbounded"/> </xs:sequence> </xs:complexType>

complexType **AuxiliaryDataReferenceType**

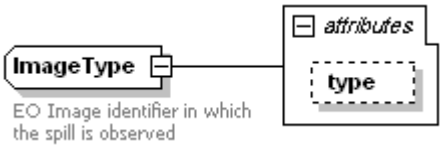
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractMetaDataType**
properties	base gml:AbstractMetaDataType mixed true
children	**csn:dataKey csn:dataReference csn:dataDescription**
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation Database handle for the object. It is of XML type ID, so is

	constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Auxiliary data related to the Oil Spill. E.g. the link to an image or other file The <csn:auxiliaryData> element contains an open structure to accomodate any additional file including oil spill clip images. For a clip image, the ./csn:dataKey element is set to ' OS_CLIP_IMAGE' and the ./csn:dataReference element is set to the file name of the clip image file.
source	<xs:complexType name="AuxiliaryDataReferenceType" mixed="true"> <xs:annotation> <xs:documentation>Auxiliary data related to the Oil Spill. E.g. the link to an image or other file</xs:documentation> </xs:annotation> <xs:complexContent mixed="true"> <xs:extension base="gml:AbstractMetaDataType"> <xs:sequence> <xs:element name="dataKey" type="xs:string"> <xs:annotation> <xs:documentation>Key/identifier of a specific auxiliary data</xs:documentation> </xs:annotation> </xs:element> <xs:element name="dataReference" type="xs:anyURI"> <xs:annotation> <xs:documentation>URI references to auxiliary data</xs:documentation> </xs:annotation> </xs:element> <xs:element name="dataDescription" type="xs:string" minOccurs="0"> <xs:annotation> <xs:documentation>Descripton of auxiliary data</xs:documentation> </xs:annotation> </xs:element> </xs:sequence>

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

complexType **ImageType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **xs:string**
properties	base xs:string

attributes

Name	Type	Use	Default	Fixed	annotation
type	csn:SensorType				

annotation

documentation

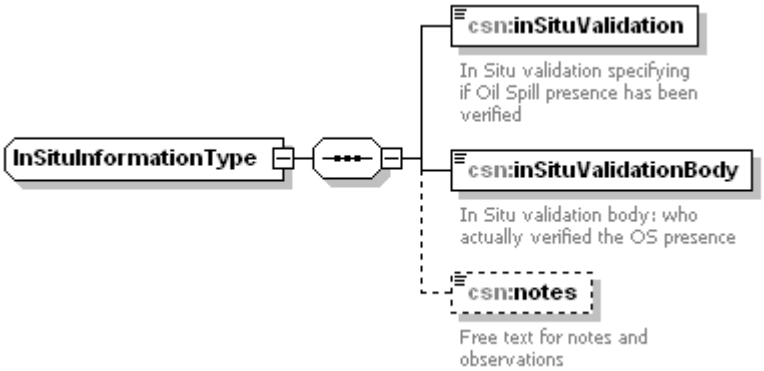
EO Image identifier in which the spill is observed

source

```
<xs:complexType name="ImageType">
  <xs:annotation>
    <xs:documentation>EO Image identifier in which the spill is observed</xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="type" type="csn:SensorType"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

complexType **InSituInformationType**

diagram



namespace	http://www.emsa.europa.eu/csndc
children	**csn:inSituValidation csn:inSituValidationBody csn:notes**

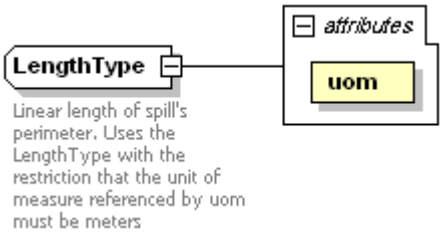
source

```
<xs:complexType name="InSituInformationType">
  <xs:sequence>
    <xs:element name="inSituValidation" type="csn:InSituValidationType">
      <xs:annotation>
```

```
      <xs:documentation>In Situ validation specifying if Oil Spill presence has been
verified</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="inSituValidationBody" type="xs:string">
    <xs:annotation>
      <xs:documentation>In Situ validation body: who actually verified the OS
presence</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="notes" type="xs:string" minOccurs="0">
    <xs:annotation>
      <xs:documentation>Free text for notes and observations</xs:documentation>
    </xs:annotation>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

complexType **LengthType**

diagram



namespace: http://www.emsa.europa.eu/csndc

type: restriction of **gml:LengthType**

properties: base gml:LengthType

attributes

Name	Type	Use	Default	Fixed	annotation
uom	**xs:anyURI**	required			

annotation

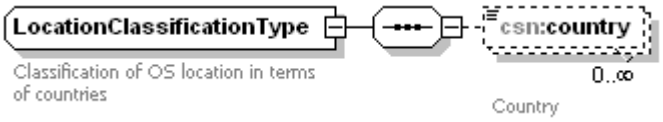
documentation

Linear length of spill's perimeter. Uses the LengthType with the restriction that the unit of measure referenced by uom must be meters

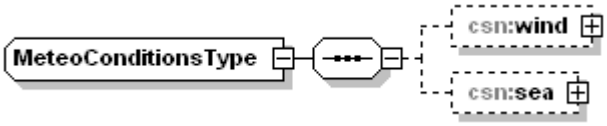
source

```
<xs:complexType name="LengthType">
 <xs:annotation>
  <xs:documentation>Linear length of spill's perimeter. Uses the LengthType with the restriction that
the unit of measure referenced by uom must be meters</xs:documentation>
 </xs:annotation>
 <xs:simpleContent>
  <xs:restriction base="gml:LengthType"/>
 </xs:simpleContent>
</xs:complexType>
```

complexType **LocationClassificationType**

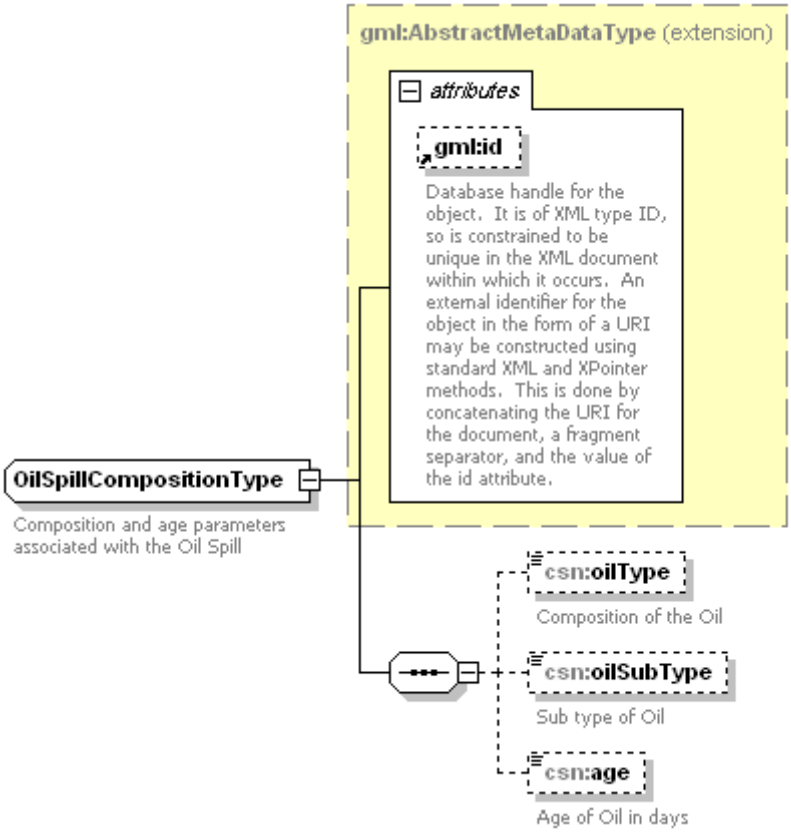
diagram	
namespace	http://www.emsa.europa.eu/csndc
properties	mixed true
children	**csn:country**
annotation	documentation Classification of OS location in terms of countries
source	<xs:complexType name="LocationClassificationType" mixed="true"> <xs:annotation> <xs:documentation>Classification of OS location in terms of countries</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="country" type="xs:string" minOccurs="0" maxOccurs="unbounded"> <xs:annotation> <xs:documentation>Country</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

complexType **MeteoConditionsType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:meteoWind csn:SARWind csn:sea**
source	<xs:complexType name="MeteoConditionsType">\ <xs:sequence> <xs:element name="meteoWind" type="csn:WindConditionType" minOccurs="0"/> <xs:element name="SARWind" type="csn:WindConditionType" minOccurs="0"/> <xs:element name="sea" type="csn:SeaConditionType" minOccurs="0"/> </xs:sequence> </xs:complexType>

complexType **OilSpillCompositionType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractMetaDataType**
properties	base gml:AbstractMetaDataType mixed true
children	**csn:oilType csn:oilSubType csn:age**

attributes

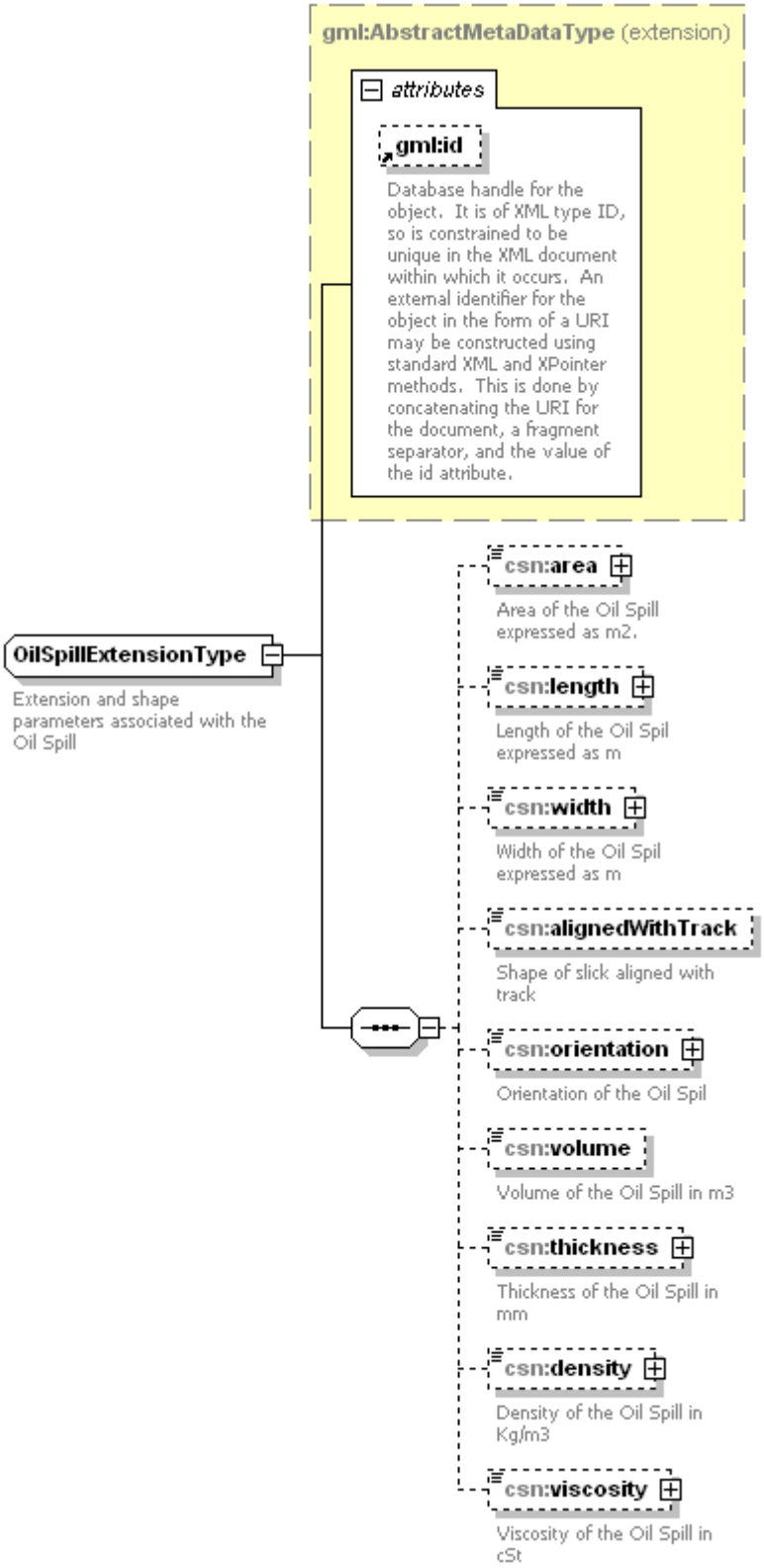
Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and

	XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Composition and age parameters associated with the Oil Spill
source	<xs:complexType name="OilSpillCompositionType" mixed="true"> <xs:annotation> <xs:documentation>Composition and age parameters associated with the Oil Spill</xs:documentation> </xs:annotation> <xs:complexContent mixed="true"> <xs:extension base="gml:AbstractMetaDataType"> <xs:sequence> <xs:element name="oilType" minOccurs="0"> <xs:annotation> <xs:documentation>Composition of the Oil</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="Light"/> <xs:enumeration value="Medium"/> <xs:enumeration value="Heavy"/> <xs:enumeration value="OTHER"/> </xs:restriction> </xs:simpleType> </xs:element> <xs:element name="oilSubType" type="xs:string" minOccurs="0"> <xs:annotation> <xs:documentation>Sub type of Oil</xs:documentation> </xs:annotation> </xs:element> <xs:element name="age" minOccurs="0"> <xs:annotation> <xs:documentation>Age of Oil in days</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="<1"/> <xs:enumeration value="1-3"/> <xs:enumeration value=">3"/> </xs:restriction> </xs:simpleType> </xs:element> </xs:sequence> </xs:extension> </xs:complexContent>

	</xs:complexType>

complexType **OilSpillExtensionType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractMetaDataType**

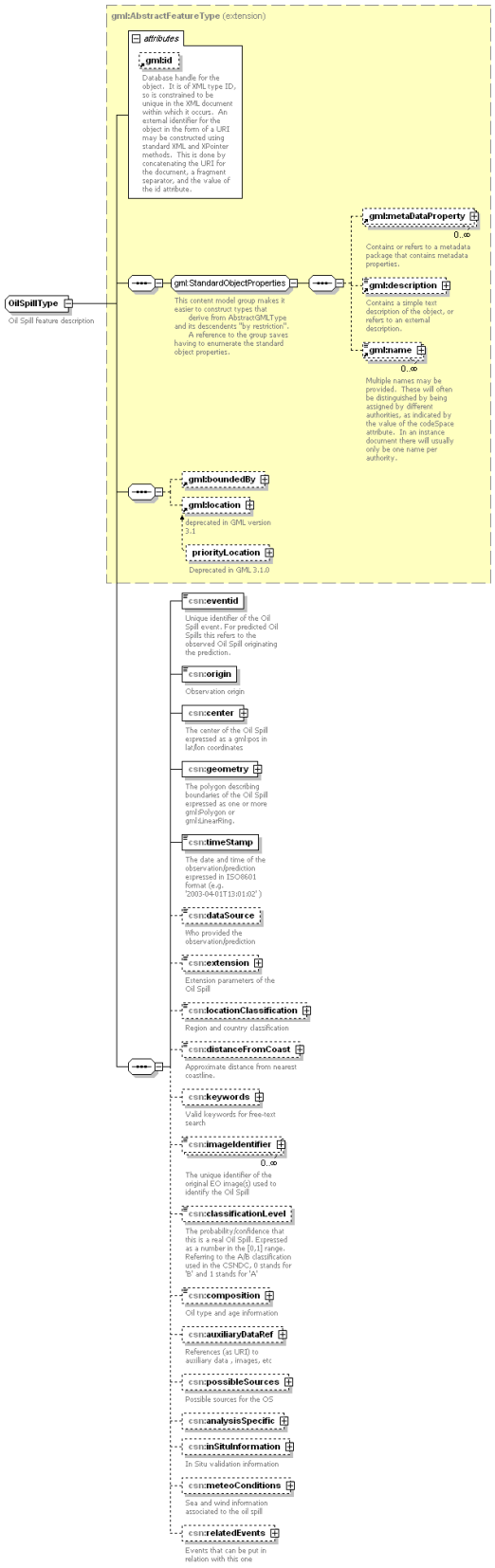
properties	base gml:AbstractMetaDataType mixed true
children	**csn:area csn:length csn:width csn:alignedWithTrack csn:orientation csn:volume csn:thickness csn:density csn:viscosity**
attributes	Name Type Use Default Fixed annotation id optional documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Extension and shape parameters associated with the Oil Spill

source

```
<xs:complexType name="OilSpillExtensionType" mixed="true">
  <xs:annotation>
    <xs:documentation>Extension and shape parameters associated with the Oil
Spill</xs:documentation>
  </xs:annotation>
  <xs:complexContent mixed="true">
    <xs:extension base="gml:AbstractMetaDataType">
      <xs:sequence>
        <xs:element name="area" type="csn:AreaType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>Area of the Oil Spill expressed as m2.</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="length" type="csn:LengthType" minOccurs="0">
          <xs:annotation>
            <xs:documentation>Length of the Oil Spil expressed as m</xs:documentation>
```

```
        </xs:annotation>
      </xs:element>
      <xs:element name="width" type="csn:LengthType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Width of the Oil Spil expressed as m</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="alignedWithTrack" type="xs:boolean" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Shape of slick aligned with track</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="orientation" type="csn:OrientationType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Orientation of the Oil Spil</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="volume" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Volume of the Oil Spill in m3</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="0-10"/>
            <xs:enumeration value="10-100"/>
            <xs:enumeration value="&gt;100"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="thickness" type="gml:MeasureType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Thickness of the Oil Spill in mm</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="density" type="gml:MeasureType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Density of the Oil Spill in Kg/m3</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="viscosity" type="gml:MeasureType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Viscosity of the Oil Spill in cSt</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
 </xs:complexContent>
</xs:complexType>
```

complexType **OilSpillType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractFeatureType**
properties	base gml:AbstractFeatureType

children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location csn:eventid csn:origin csn:center csn:geometry csn:timeStamp csn:dataSource csn:extension csn:locationClassification csn:distanceFromCoast csn:keywords csn:imageIdentifier csn:classificationLevel csn:composition csn:auxiliaryDataRef csn:possibleSources csn:analysisSpecific csn:inSituInformation csn:meteoConditions csn:relatedEvents**
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation: Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Oil Spill feature description

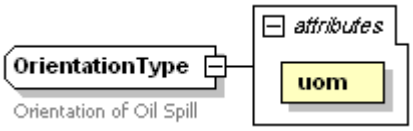
source

```
<xs:complexType name="OilSpillType">
  <xs:annotation>
    <xs:documentation>Oil Spill feature description</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="eventid" type="xs:string">
          <xs:annotation>
            <xs:documentation>Unique identifier of the Oil Spill event. For predicted Oil Spills this refers to
the observed Oil Spill originating the prediction. </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="origin" type="csn:OriginType">
          <xs:annotation>
            <xs:documentation>Observation origin</xs:documentation>
```

```
        </xs:annotation>
      </xs:element>
      <xs:element name="center" type="gml:PointType">
        <xs:annotation>
          <xs:documentation>The center of the Oil Spill expressed as a gml:pos in lat/lon
coordinates</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="geometry" type="gml:GeometryArrayPropertyType">
        <xs:annotation>
          <xs:documentation>The polygon describing boundaries of the Oil Spill expressed as one or
more gml:Polygon </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="timeStamp" type="xs:dateTime">
        <xs:annotation>
          <xs:documentation>The date and time of the observation/prediction expressed in ISO8601
format (e.g. '2003-04-01T13:01:02' )</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="dataSource" type="xs:string" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Who provided the observation/prediction</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="extension" type="csn:OilSpillExtensionType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Extension parameters of the Oil Spill</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="locationClassification" type="csn:LocationClassificationType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Region and country classification</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="distanceFromCoast" type="gml:LengthType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Approximate distance from nearest coastline.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="keywords" type="ows:KeywordsType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Valid keywords for free-text search</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="imageIdentifier" type="csn:ImageType" minOccurs="0"
maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation>The unique identifier of the original EO image(s) used to identify the Oil
Spill</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="classificationLevel" type="xs:double" minOccurs="0">
        <xs:annotation>
```

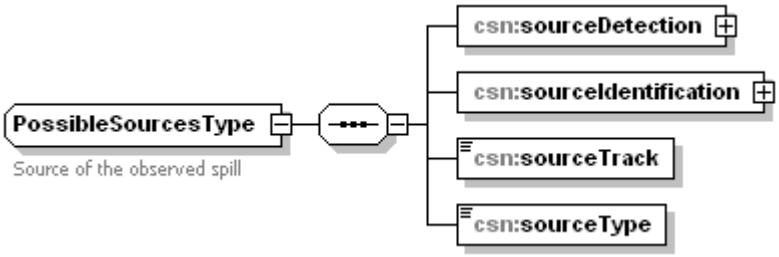
```
          <xs:documentation>The probability/confidence that this is a real Oil Spill. Expressed as a number in the [0,1] range. Referring to the A/B classification used in the CSNDC, 0 stands for 'B' and 1 stands for 'A'</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="composition" type="csn:OilSpillCompositionType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Oil type and age information</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="auxiliaryDataRef" type="csn:AuxiliaryDataReferenceArrayType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>References (as URI) to auxiliary data , images, etc</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="possibleSources" type="csn:PossibleSourcesType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Possible sources for the OS</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="analysisSpecific" type="csn:SlickTechParametersType" minOccurs="0"/>
      <xs:element name="inSituInformation" type="csn:InSituInformationType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>In Situ validation information</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="meteoConditions" type="csn:MeteoConditionsType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Sea and wind information associated to the oil spill</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="relatedEvents" type="csn:RelatedEventsType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Events that can be put in relation with this one</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
 </xs:complexContent>
</xs:complexType>
```

complexType **OrientationType**

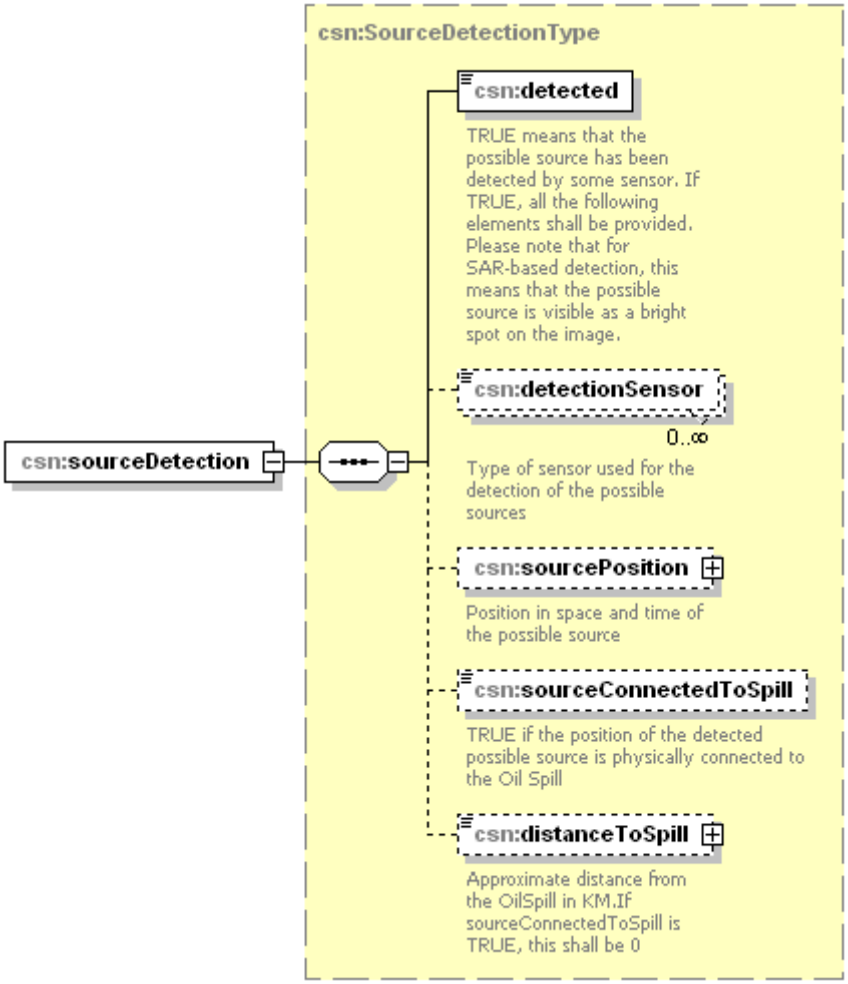
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **gml:AngleType**
properties	base gml:AngleType

attributes	Name	Type	Use	Default	Fixed	annotation
	uom	**xs:anyURI**	required			
annotation	documentation Orientation of Oil Spill					
source	<xs:complexType name="OrientationType"> <xs:annotation> <xs:documentation>Orientation of Oil Spill</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:restriction base="gml:AngleType"/> </xs:simpleContent> </xs:complexType>					

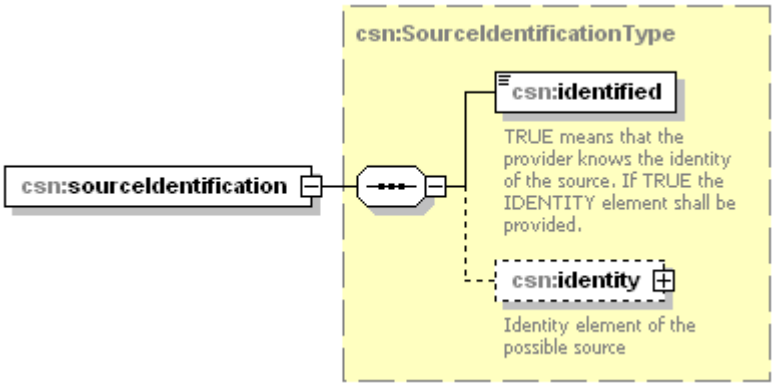
complexType **PossibleSourcesType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:sourceDetection** **csn:sourceIdentification** **csn:sourceTrack** **csn:sourceType**
used by	element **OilSpillType/possibleSource**
annotation	documentation Source of the observed spill
source	<xs:complexType name="PossibleSourcesType"> <xs:annotation> <xs:documentation>Source of the observed spill</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="sourceDetection" type="csn:SourceDetectionType"/> <xs:element name="sourceIdentification" type="csn:SourceIdentificationType"/> <xs:element name="sourceTrack" type="xs:boolean"/> <xs:element name="sourceType" type="csn:SourceTypeType"/> </xs:sequence> </xs:complexType>

element **PossibleSourcesType/sourceDetection**

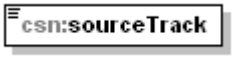
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:SourceDetectionType
properties	isRef 0 content complex
children	csn:detected csn:detectionSensor csn:sourcePosition csn:sourceConnectedToSpill csn:distanceToSpill
source	<xs:element name="sourceDetection" type="csn:SourceDetectionType"/>

element **PossibleSourcesType/sourceIdentification**

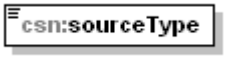
diagram	

namespace	http://www.emsa.europa.eu/csndc
type	**csn:SourceIdentificationType**
children	**csn:identified** **csn:identity**
source	<xs:element name="sourceIdentification" type="csn:SourceIdentificationType"/>

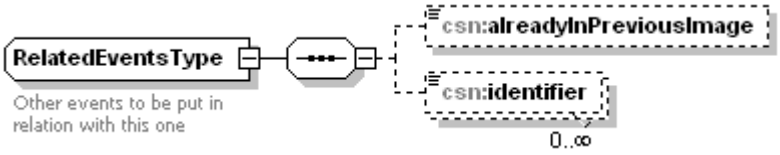
element **PossibleSourcesType/sourceTrack**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:boolean**
source	<xs:element name="sourceTrack" type="xs:boolean"/>

element **PossibleSourcesType/sourceType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:SourceTypeType**
facets	enumeration VESSEL enumeration OFFSHORE PLATFORM enumeration WRECK enumeration PIPELINE enumeration NATURAL enumeration OTHER enumeration UNKNOWN
source	<xs:element name="sourceType" type="csn:SourceTypeType"/>

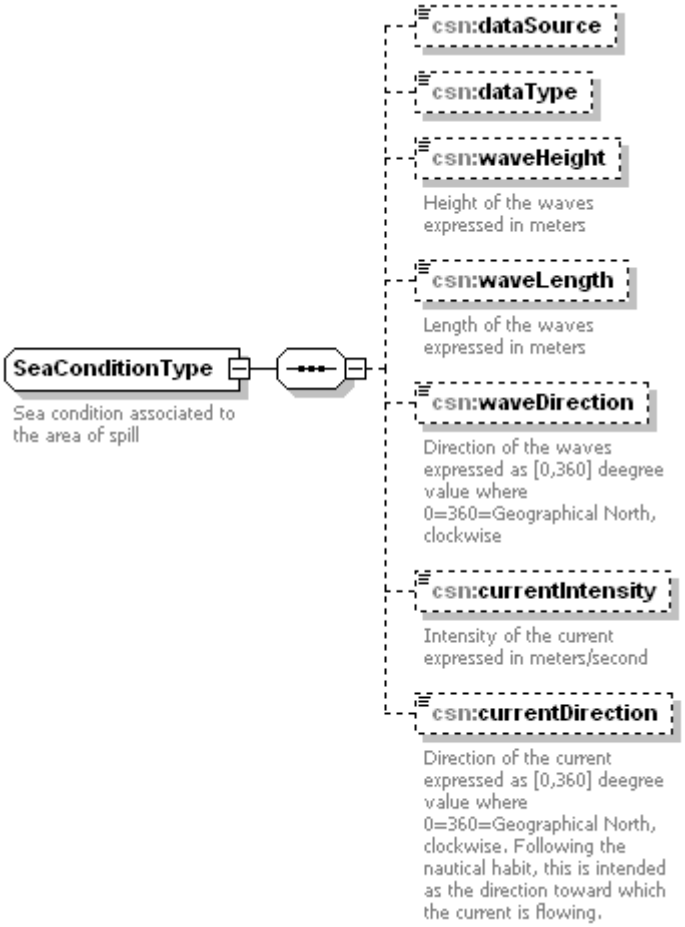
complexType **RelatedEventsType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:alreadyInPreviousImage csn:identifier**
annotation	documentation Other events to be put in relation with this one
source	<xs:complexType name="RelatedEventsType"> <xs:annotation> <xs:documentation>Other events to be put in relation with this one</xs:documentation> </xs:annotation> <xs:sequence>

```
    <xs:element name="alreadyInPreviousImage" type="xs:boolean" minOccurs="0"/>
    <xs:element name="identifier" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

complexType **SeaConditionType**

diagram



namespace	http://www.emsa.europa.eu/csndc
children	**csn:dataSource csn:dataType csn:waveHeight csn:waveLength csn:waveDirection csn:currentIntensity csn:currentDirection**
annotation	documentation Sea condition associated to the area of spill

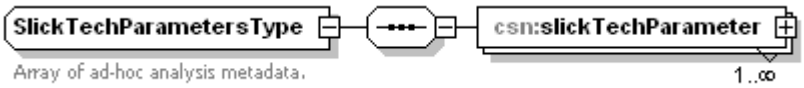
source

```
<xs:complexType name="SeaConditionType">
  <xs:annotation>
    <xs:documentation>Sea condition associated to the area of spill</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="dataSource" type="xs:string" minOccurs="0"/>
    <xs:element name="dataType" type="xs:string" minOccurs="0"/>
    <xs:element name="waveHeight" type="xs:double" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Height of the waves expressed in meters</xs:documentation>
      </xs:annotation>
    </xs:element>
```

```
    <xs:element name="waveLength" type="xs:double" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Length of the waves expressed in meters</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="waveDirection" type="xs:integer" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Direction of the waves expressed as [0,360] deegree value where
0=360=Geographical North, clockwise </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="currentIntensity" type="xs:double" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Intensity of the current expressed in meters/second</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="currentDirection" type="xs:integer" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Direction of the current expressed as [0,360] deegree value where
0=360=Geographical North, clockwise. Following the nautical habit, this is intended as the direction
toward which the current is flowing.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

complexType **SlickTechParametersType**

diagram



namespace: http://www.emsa.europa.eu/csndc

children: **csn:slickTechParameter**

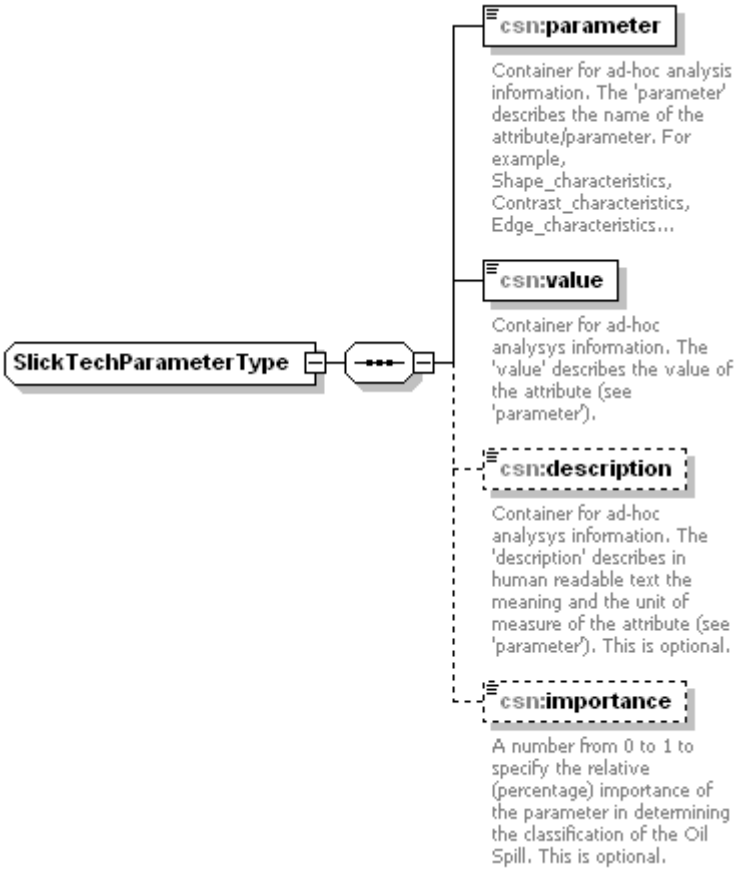
annotation: documentation
Array of ad-hoc analysis metadata.

source

```
<xs:complexType name="SlickTechParametersType">
  <xs:annotation>
    <xs:documentation>Array of ad-hoc analysis metadata.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="slickTechParameter" type="csn:SlickTechParameterType"
maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

complexType **SlickTechParameterType**

diagram



namespace: http://www.emsa.europa.eu/csndc

children: **csn:parameter csn:value csn:description csn:importance**

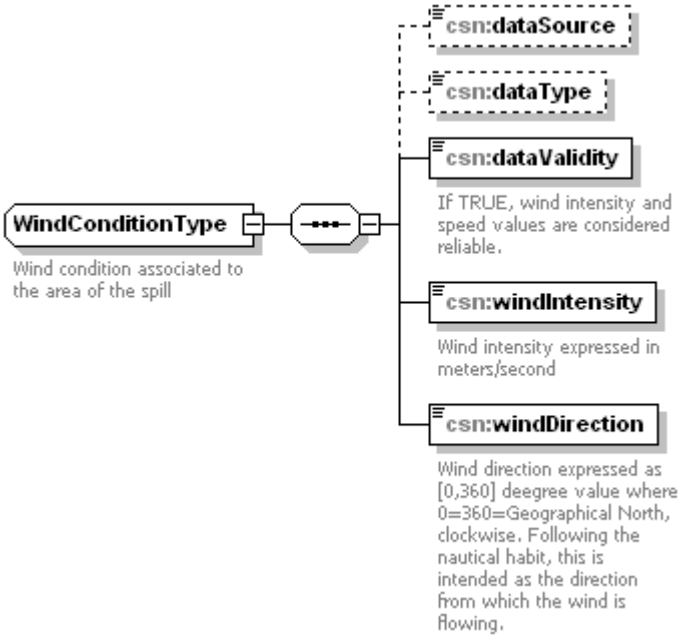
source

```
<xs:complexType name="SlickTechParameterType">
 <xs:sequence>
  <xs:element name="parameter" type="xs:string">
   <xs:annotation>
    <xs:documentation>Container for ad-hoc analysis information. The 'parameter' describes the name of the attribute/parameter. For example, Shape_characteristics, Contrast_characteristics, Edge_characteristics... </xs:documentation>
   </xs:annotation>
  </xs:element>
  <xs:element name="value" type="xs:string">
   <xs:annotation>
    <xs:documentation>Container for ad-hoc analysys information. The 'value' describes the value of the attribute (see 'parameter').</xs:documentation>
   </xs:annotation>
  </xs:element>
  <xs:element name="description" type="xs:string" minOccurs="0">
   <xs:annotation>
    <xs:documentation>Container for ad-hoc analysys information. The 'description' describes in human readable text the meaning and the unit of measure of the attribute (see 'parameter'). This is optional.</xs:documentation>
   </xs:annotation>
  </xs:element>
  <xs:element name="importance" type="csn:SlickParameterImportanceType" minOccurs="0">
   <xs:annotation>
```

```
      <xs:documentation>A number from 0 to 1 to specify the relative (percentage) importance of the parameter in determining the classification of the Oil Spill. This is optional.</xs:documentation>
    </xs:annotation>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

complexType **WindConditionType**

diagram



namespace	http://www.emsa.europa.eu/csndc
children	**csn:dataSource csn:dataType csn:dataValidity csn:windIntensity csn:windDirection**
annotation	documentation Wind condition associated to the area of the spill

source

```
<xs:complexType name="WindConditionType">
 <xs:annotation>
  <xs:documentation>Wind condition associated to the area of the spill</xs:documentation>
 </xs:annotation>
 <xs:sequence>
  <xs:element name="dataSource" type="xs:string" minOccurs="0"/>
  <xs:element name="dataType" type="xs:string" minOccurs="0"/>
  <xs:element name="dataValidity" type="xs:boolean">
   <xs:annotation>
    <xs:documentation>If TRUE, wind intensity and speed values are considered reliable.</xs:documentation>
   </xs:annotation>
  </xs:element>
  <xs:element name="windIntensity" type="xs:double">
   <xs:annotation>
    <xs:documentation>Wind intensity expressed in meters/second</xs:documentation>
   </xs:annotation>
  </xs:element>
  <xs:element name="windDirection" type="xs:integer">
   <xs:annotation>
```

```
      <xs:documentation>Wind direction expressed as [0,360] deegree value where
0=360=Geographical North, clockwise. Following the nautical habit, this is intended as the direction
from which the wind is flowing.</xs:documentation>
    </xs:annotation>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

simpleType **InSituValidationType**

namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
facets	enumeration OS_VERIFIED enumeration OS_NOT_VERIFIED
annotation	documentation In Situ validation specifying if Oil Spill presence has been verified in facts

source

```
<xs:simpleType name="InSituValidationType">
 <xs:annotation>
  <xs:documentation>In Situ validation specifying if Oil Spill presence has been verified in
facts</xs:documentation>
 </xs:annotation>
 <xs:restriction base="xs:string">
  <xs:enumeration value="OS_VERIFIED"/>
  <xs:enumeration value="OS_NOT_VERIFIED"/>
 </xs:restriction>
</xs:simpleType>
```

simpleType **OriginType**

namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
facets	enumeration EXPECTED enumeration DETECTED enumeration PREDICTED
annotation	documentation Observation origin of the Oil Spill. It could be EXPECTED meaning that the presence of the Oil Spill is expected as part of a test dataset or insitu independent observation, or DETECTED meaning that the presence of the Oil Spill has been actually detected by the original EO image classification. It is predicted when it comes from a DTOS prediction service.

source

```
<xs:simpleType name="OriginType">
 <xs:annotation>
  <xs:documentation>Observation origin of the Oil Spill. It could be EXPECTED meaning that the
presence of the Oil Spill is expected as part of a test dataset or insitu independent observation, or
DETECTED meaning that the presence of the Oil Spill has been actually detected by the original EO
image classification. It is predicted when it comes from a DTOS prediction service.</xs:documentation>
 </xs:annotation>
 <xs:restriction base="xs:string">
  <xs:enumeration value="EXPECTED"/>
  <xs:enumeration value="DETECTED"/>
  <xs:enumeration value="PREDICTED"/>
 </xs:restriction>
```

	</xs:simpleType>

simpleType **SensorType**

namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
facets	enumeration SAR enumeration VIS-IR enumeration OTHER
annotation	documentation EO Sensor Type
source	<xs:simpleType name="SensorType">
<xs:annotation>
<xs:documentation>EO Sensor Type</xs:documentation>
</xs:annotation>
<xs:restriction base="xs:string">
<xs:enumeration value="SAR"/>
<xs:enumeration value="VIS-IR"/>
<xs:enumeration value="OTHER"/>
</xs:restriction>
</xs:simpleType>

simpleType **SlickParameterImportanceType**

namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:double**
facets	minInclusive 0 maxInclusive 1
annotation	documentation Relative importance of a parameter in determining the oil spill classification. It is the percentage weight of the parameter in classifying the oil spill expressed as a number in the 0 (not used) to 1 (most important) range.
source	<xs:simpleType name="SlickParameterImportanceType">
<xs:annotation>
<xs:documentation>Relative importance of a parameter in determining the oil spill classification. It is the percentage weight of the parameter in classifying the oil spill expressed as a number in the 0 (not used) to 1 (most important) range.</xs:documentation>
</xs:annotation>
<xs:restriction base="xs:double">
<xs:minInclusive value="0"/>
<xs:maxInclusive value="1"/>
</xs:restriction>
</xs:simpleType>

7 Annex D – Detected Ship Feature GML schema

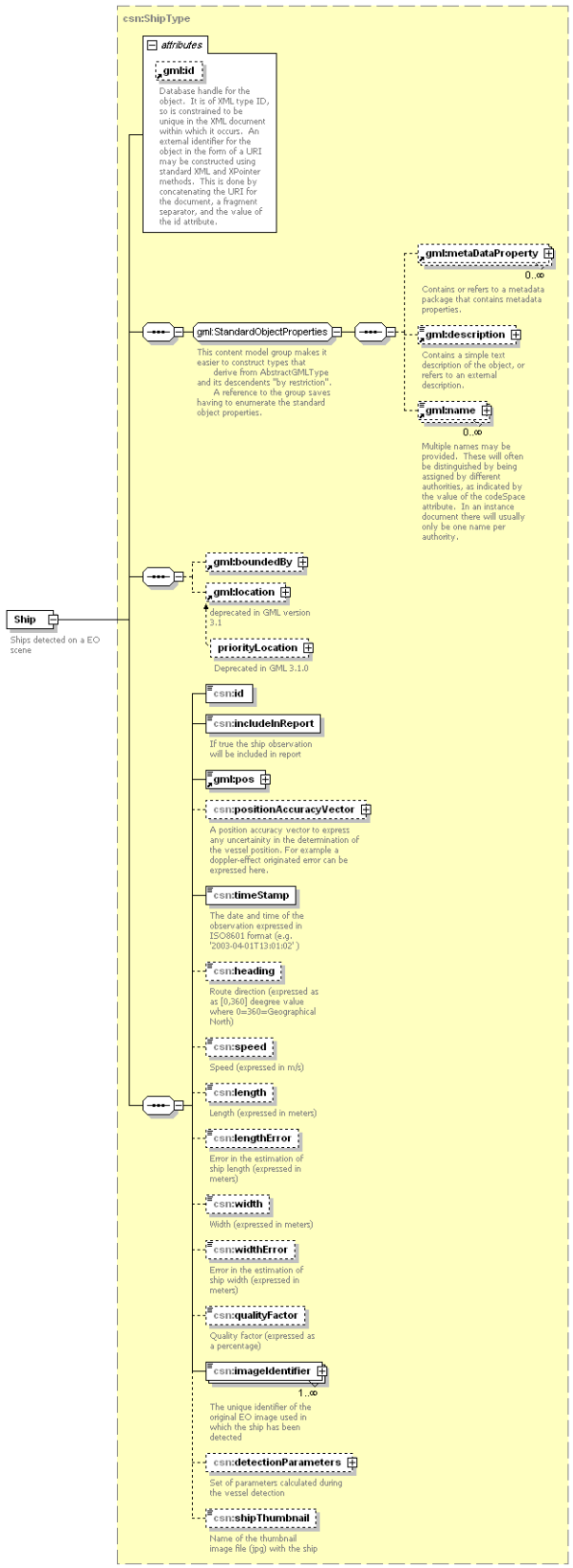
Schema csndc_ds.xsd

attribute form default:	**unqualified**
element form default:	**qualified**
targetNamespace:	**http://www.emsa.europa.eu/csndc**

Elements	Complex types
Ship	**DetectionParametersType**
	PositionAccuracyVectorType
	ShipType

element **Ship**

diagram

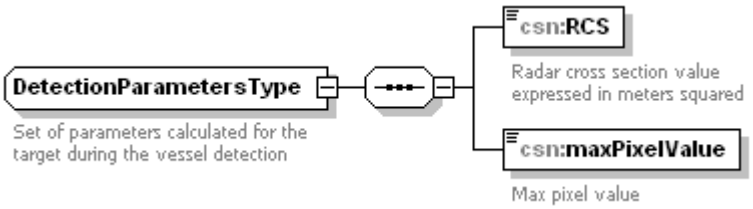


namespace	http://www.emsa.europa.eu/csndc
type	**csn:ShipType**
properties	content complex substGrp gml:_Feature

children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location csn:id csn:includeInReport gml:pos csn:positionAccuracyVector csn:timeStamp csn:heading csn:speed csn:length csn:lengthError csn:width csn:widthError csn:confidenceLevel csn:imageIdentifier csn:detectionParameters csn:shipThumbnail**
attributes	Name: id Type: Use: optional Default: Fixed: annotation documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Ships detected on a EO scene

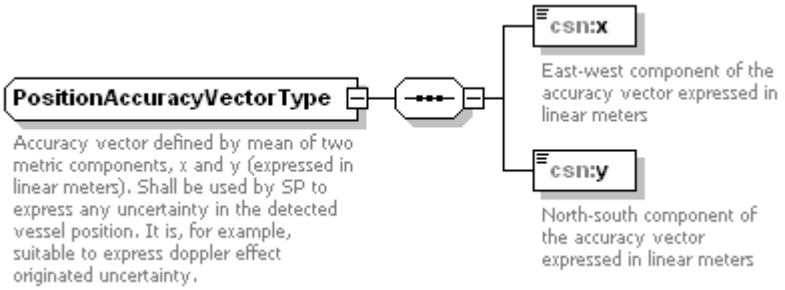
source	`<xs:element name="Ship" type="csn:ShipType" substitutionGroup="gml:_Feature">`
	`<xs:annotation>`
	`<xs:documentation>Ships detected on a EO scene</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

complexType **DetectionParametersType**

diagram	
namespace	http://www.emsa.europa.eu/csndc

children	**csn:RCS csn:maxPixelValue**
annotation	documentation Set of parameters calculated for the target during the vessel detection
source	<xs:complexType name="DetectionParametersType"> <xs:annotation> <xs:documentation>Set of parameters calculated for the target during the vessel detection</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="RCS" type="xs:double"> <xs:annotation> <xs:documentation>Radar cross section value expressed in meters squared</xs:documentation> </xs:annotation> </xs:element> <xs:element name="maxPixelValue" type="xs:double"> <xs:annotation> <xs:documentation>Max pixel value</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

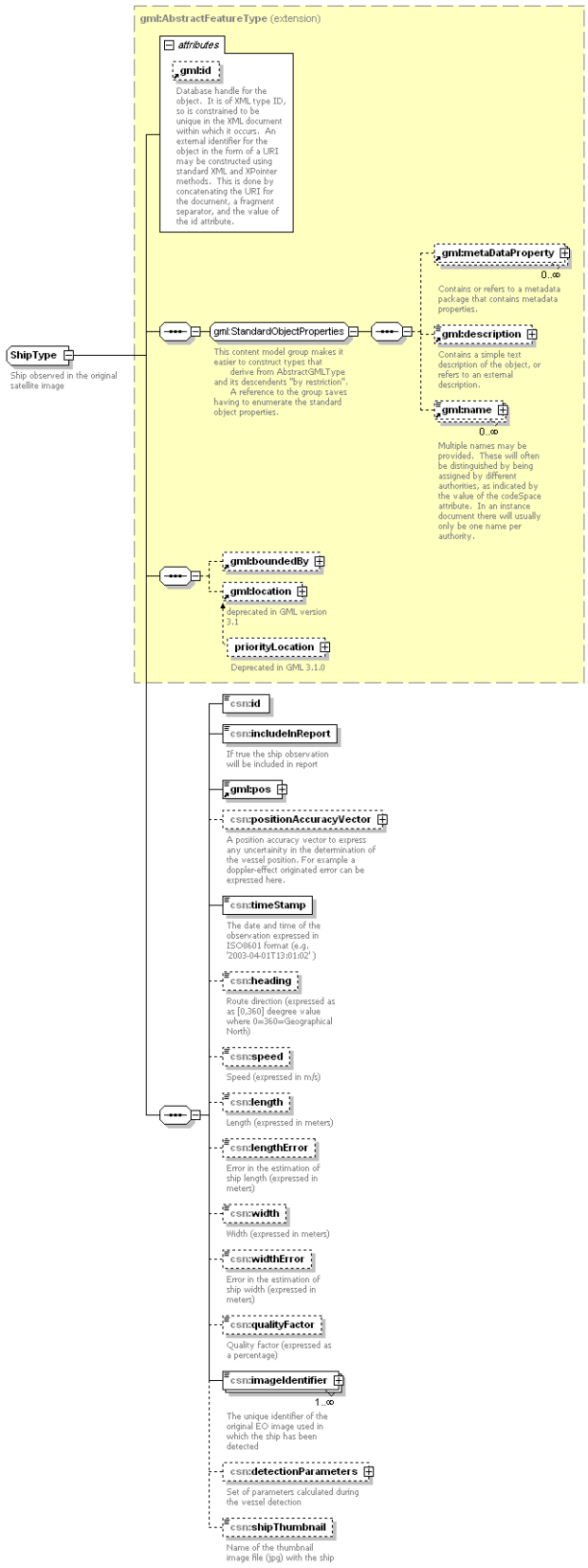
complexType **PositionAccuracyVectorType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:x csn:y**
annotation	documentation Accuracy vector defined by mean of two metric components, x and y (expressed in linear meters). Shall be used by SP to express any uncertainty in the detected vessel position. It is, for example, suitable to express doppler effect originated uncertainty.
source	<xs:complexType name="PositionAccuracyVectorType"> <xs:annotation> <xs:documentation>Accuracy vector defined by mean of two metric components, x and y (expressed in linear meters). Shall be used by SP to express any uncertainty in the detected vessel position. It is, for example, suitable to express doppler effect originated uncertainty.</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="x" type="xs:integer"> <xs:annotation> <xs:documentation>East-west component of the accuracy vector expressed in linear meters</xs:documentation> </xs:annotation>

	<xs:element> <xs:element name="y" type="xs:integer"> <xs:annotation> <xs:documentation>North-south component of the accuracy vector expressed in linear meters</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

complexType **ShipType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractFeatureType**
properties	base gml:AbstractFeatureType

children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location csn:id csn:includeInReport gml:pos csn:positionAccuracyVector csn:timeStamp csn:heading csn:speed csn:length csn:lengthError csn:width csn:widthError csn:confidenceLevel csn:imageIdentifier csn:detectionParameters csn:shipThumbnail**
attributes	Name: id Type: Use: optional Default: Fixed: annotation documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Ship observed in the original satellite image
source	<xs:complexType name="ShipType"> <xs:annotation> <xs:documentation>Ship observed in the original satellite image</xs:documentation> </xs:annotation> <xs:complexContent> <xs:extension base="gml:AbstractFeatureType"> <xs:sequence> <xs:element name="id" type="xs:string"/> <xs:element name="includeInReport" type="xs:boolean" default="false"> <xs:annotation> <xs:documentation>If true the ship observation will be included in report</xs:documentation> </xs:annotation> </xs:element> <xs:element ref="gml:pos"/> <xs:element name="positionAccuracyVector" type="csn:PositionAccuracyVectorType" minOccurs="0"> <xs:annotation>

```
          <xs:documentation>A position accuracy vector to express any uncertainity in the determination
of the vessel position. For example a doppler-effect originated error can be expressed
here.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="timeStamp" type="xs:dateTime">
        <xs:annotation>
          <xs:documentation>The date and time of the observation expressed in ISO8601 format (e.g.
'2003-04-01T13:01:02' )</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="heading" type="xs:integer" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Route direction (expressed as as [0,360] deegree value where
0=360=Geographical North)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="speed" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Speed (expressed in m/s)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="length" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Length (expressed in meters)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="lengthError" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Error in the estimation of ship length (expressed in
meters)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="width" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Width (expressed in meters)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="widthError" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Error in the estimation of ship width (expressed in
meters)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="confidenceLevel" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Confidence level (expressed as a percentage)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="imageIdentifier" type="csn:ImageType" maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation>The unique identifier of the original EO image used in which the ship has
been detected</xs:documentation>
        </xs:annotation>
```

```
      </xs:element>
      <xs:element name="detectionParameters" type="csn:DetectionParametersType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Set of parameters calculated during the vessel
detection</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="shipThumbnail" type="xs:string" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Name of the thumbnail image file (jpg) with the ship</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
 </xs:complexContent>
</xs:complexType>
```

8 Annex E – Image Quality XML schemas

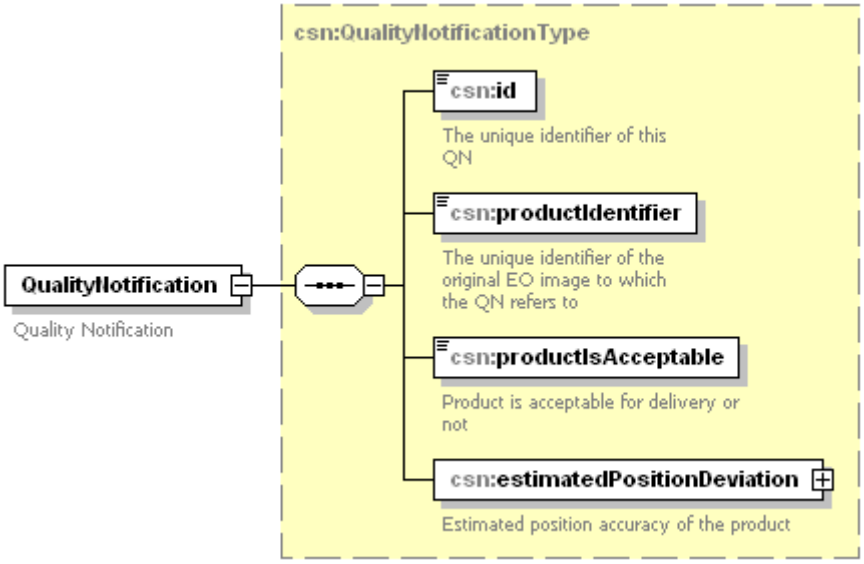
9 Quality Notification XML schema

Schema csndc_qn.xsd

targetNamespace: **http://www.emsa.europa.eu/csndc**

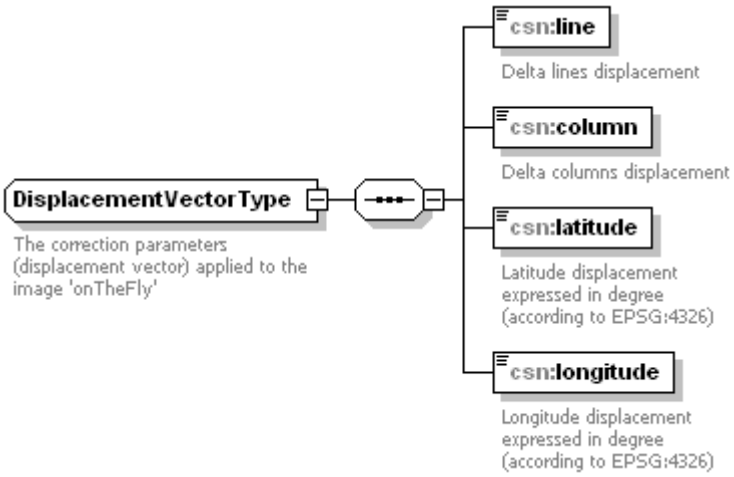
Elements	Complex types
QualityNotification	DisplacementVectorType
	EstimatedPositionDeviationType
	ProductType
	QualityNotificationType

element **QualityNotification**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:QualityNotificationType
properties	content complex
children	**csn:id csn:productIdentifier csn:productIsAcceptable csn:estimatedPositionDeviation**
annotation	documentation Quality Notification
source	<xs:element name="QualityNotification" type="csn:QualityNotificationType"> <xs:annotation> <xs:documentation>Quality Notification</xs:documentation> </xs:annotation>

	</xs:element>

complexType **DisplacementVectorType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:line csn:column csn:latitude csn:longitude**
annotation	documentation The correction parameters (displacement vector) applied to the image 'onTheFly'

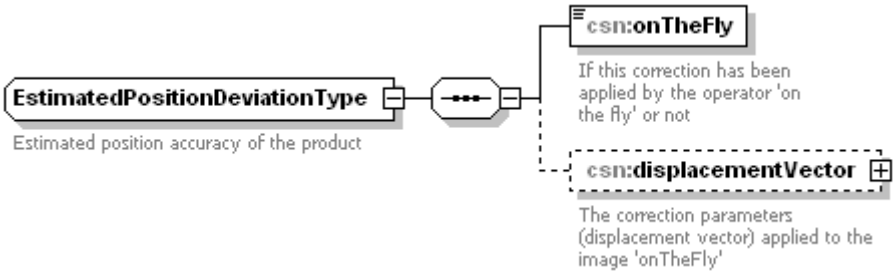
source

```
<xs:complexType name="DisplacementVectorType">
  <xs:annotation>
    <xs:documentation>The correction parameters (displacement vector) applied to the image
'onTheFly'</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="line" type="xs:integer">
      <xs:annotation>
        <xs:documentation>Delta lines displacement. It is the number of lines which have to be added to
the calculated INPUT lines position to get the corrected values. A positive displacementVector.line is
necessary to shift an image which is located too far forwards in the along track position back to its
correct position. </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="column" type="xs:integer">
      <xs:annotation>
        <xs:documentation>Delta columns displacement. It is the number of columns which have to be
added to the calculated INPUT columns position to get the corrected values. A positive
displacementVector.column is necessary to shift an image which is located too far in the across track
position back to its correct position.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="latitude" type="xs:double">
      <xs:annotation>
        <xs:documentation>Latitude displacement expressed in degree (according to
EPSG:4326)</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="longitude" type="xs:double">
      <xs:annotation>
```

```
      <xs:documentation>Longitude displacement expressed in degree (according to EPSG:4326)</xs:documentation>
    </xs:annotation>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

complexType **EstimatedPositionDeviationType**

diagram



namespace	http://www.emsa.europa.eu/csndc
children	**csn:onTheFly csn:displacementVector**
annotation	documentation Estimated position accuracy of the product

source

```
<xs:complexType name="EstimatedPositionDeviationType">
 <xs:annotation>
  <xs:documentation>Estimated position accuracy of the product</xs:documentation>
 </xs:annotation>
 <xs:sequence>
  <xs:element name="onTheFly" type="xs:boolean">
   <xs:annotation>
    <xs:documentation>If this correction has been applied by the operator 'on the fly' or not</xs:documentation>
   </xs:annotation>
  </xs:element>
  <xs:element name="displacementVector" type="csn:DisplacementVectorType" minOccurs="0">
   <xs:annotation>
    <xs:documentation>The correction parameters (displacement vector) applied to the image 'onTheFly'</xs:documentation>
   </xs:annotation>
  </xs:element>
 </xs:sequence>
</xs:complexType>
```

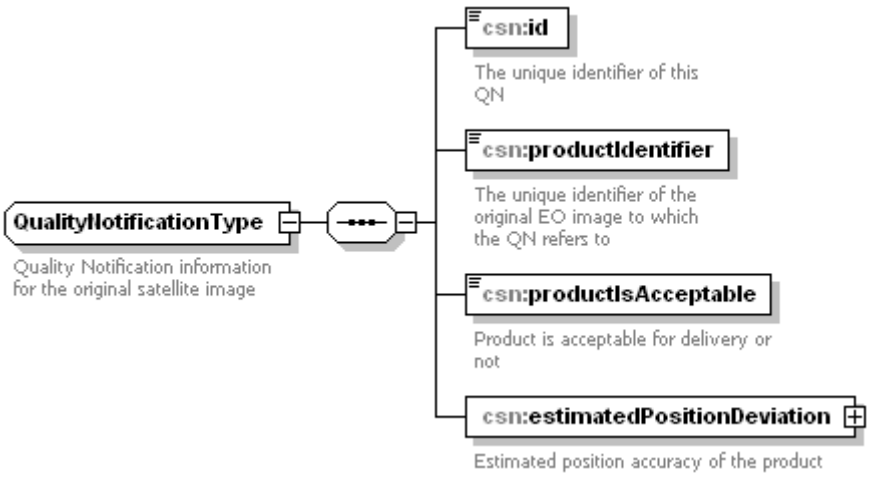
complexType **ProductType**

diagram

namespace	http://www.emsa.europa.eu/csndc
type	extension of **xs:string**
properties	base xs:string

annotation	documentation EO Product identifier
source	<xs:complexType name="ProductType"> <xs:annotation> <xs:documentation>EO Product identifier</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:string"/> </xs:simpleContent> </xs:complexType>

complexType **QualityNotificationType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:id csn:productIdentifier csn:productIsAcceptable csn:estimatedPositionDeviation**
annotation	documentation Quality Notification information for the original satellite image
source	<xs:complexType name="QualityNotificationType">\ <xs:annotation> <xs:documentation>Quality Notification information for the original satellite image</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="id" type="xs:string"> <xs:annotation> <xs:documentation>The unique identifier of this QN</xs:documentation> </xs:annotation> </xs:element> <xs:element name="productIdentifier" type="csn:ProductType"> <xs:annotation> <xs:documentation>The unique identifier of the original EO image to which the QN refers to</xs:documentation> </xs:annotation> </xs:element> <xs:element name="productIsAcceptable" type="xs:boolean"> <xs:annotation> <xs:documentation>Product is acceptable for delivery or not</xs:documentation>

```
      </xs:annotation>
    </xs:element>
    <xs:element name="estimatedPositionDeviation" type="csn:EstimatedPositionDeviationType">
      <xs:annotation>
        <xs:documentation>Estimated position accuracy of the product</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

10 Quality Report XML schema

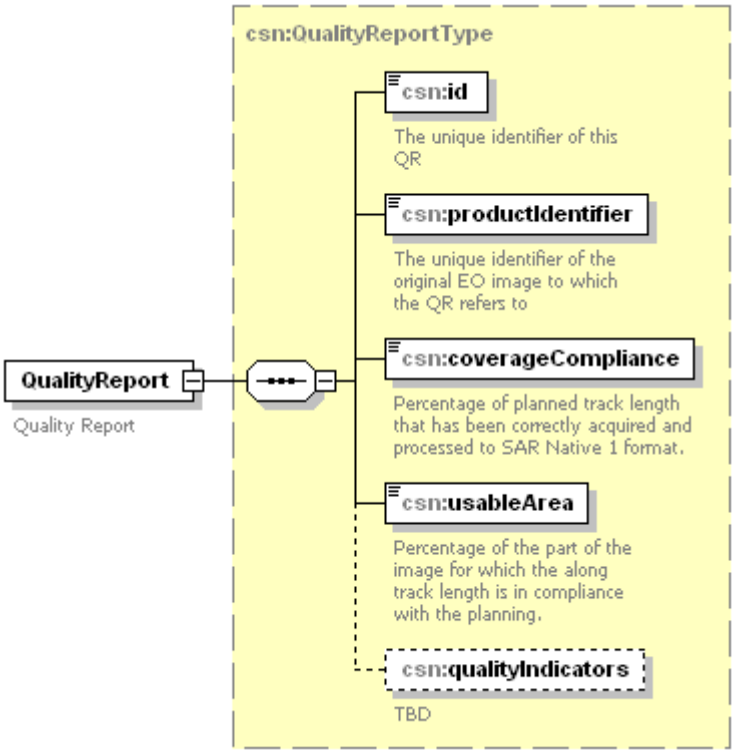
Schema csndc_qr.xsd

attribute form default:	**unqualified**
element form default:	**qualified**
targetNamespace:	**http://www.emsa.europa.eu/csndc**

Elements	Complex types
QualityReport	ProductType
	QualityIndicatorsType
	QualityReportType

element **QualityReport**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	**csn:QualityReportType**
properties	content complex
children	**csn:id csn:productIdentifier csn:coverageCompliance csn:usableArea csn:qualityIndicators**
annotation	documentation Quality Report
source	<xs:element name="QualityReport" type="csn:QualityReportType"> <xs:annotation> <xs:documentation>Quality Report</xs:documentation> </xs:annotation> </xs:element>

complexType **ProductType**

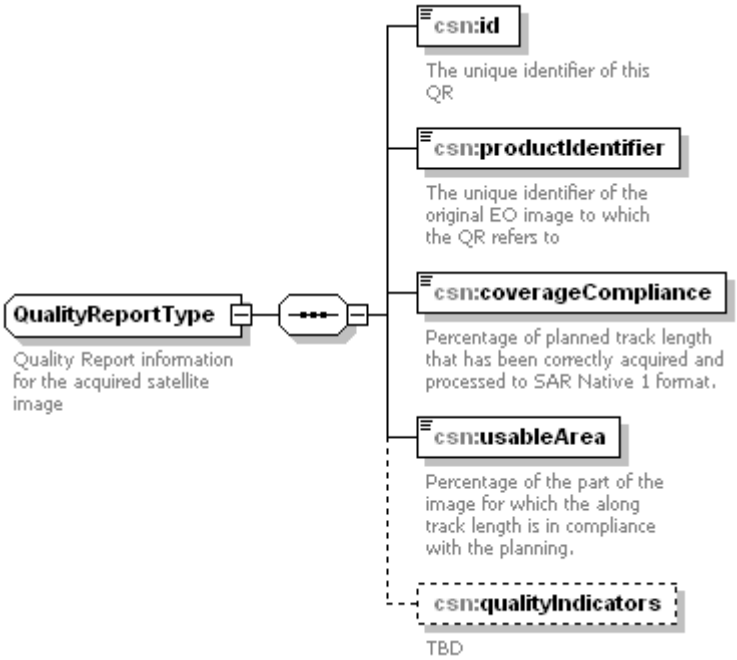
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	extension of **xs:string**
properties	base xs:string
annotation	documentation EO Product identifier
source	<xs:complexType name="ProductType"> <xs:annotation> <xs:documentation>EO Product identifier</xs:documentation> </xs:annotation> <xs:simpleContent> <xs:extension base="xs:string"/> </xs:simpleContent> </xs:complexType>

complexType **QualityIndicatorsType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
annotation	documentation TBD
source	<xs:complexType name="QualityIndicatorsType"> <xs:annotation> <xs:documentation>TBD</xs:documentation> </xs:annotation> </xs:complexType>

complexType **QualityReportType**

diagram



namespace	http://www.emsa.europa.eu/csndc
children	**csn:id csn:productIdentifier csn:coverageCompliance csn:usableArea csn:qualityIndicators**
annotation	documentation Quality Report information for the acquired satellite image

source

```
<xs:complexType name="QualityReportType">
  <xs:annotation>
    <xs:documentation>Quality Report information for the acquired satellite image</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="id" type="xs:string">
      <xs:annotation>
        <xs:documentation>The unique identifier of this QR</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="productIdentifier" type="csn:ProductType">
      <xs:annotation>
        <xs:documentation>The unique identifier of the original EO image to which the QR refers
to</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="coverageCompliance" type="xs:double">
      <xs:annotation>
        <xs:documentation>Percentage of planned track length that has been correctly acquired and
processed to SAR Native 1 format.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="usableArea" type="xs:double">
      <xs:annotation>
        <xs:documentation>Percentage of the part of the image for which the along track length is in
compliance with the planning.</xs:documentation>
      </xs:annotation>
    </xs:element>
```

	<xs:element name="qualityIndicators" type="csn:QualityIndicatorsType" minOccurs="0"> <xs:annotation> <xs:documentation>TBD</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:complexType>

11 Annex F – MyOcean catalogue item GML schema

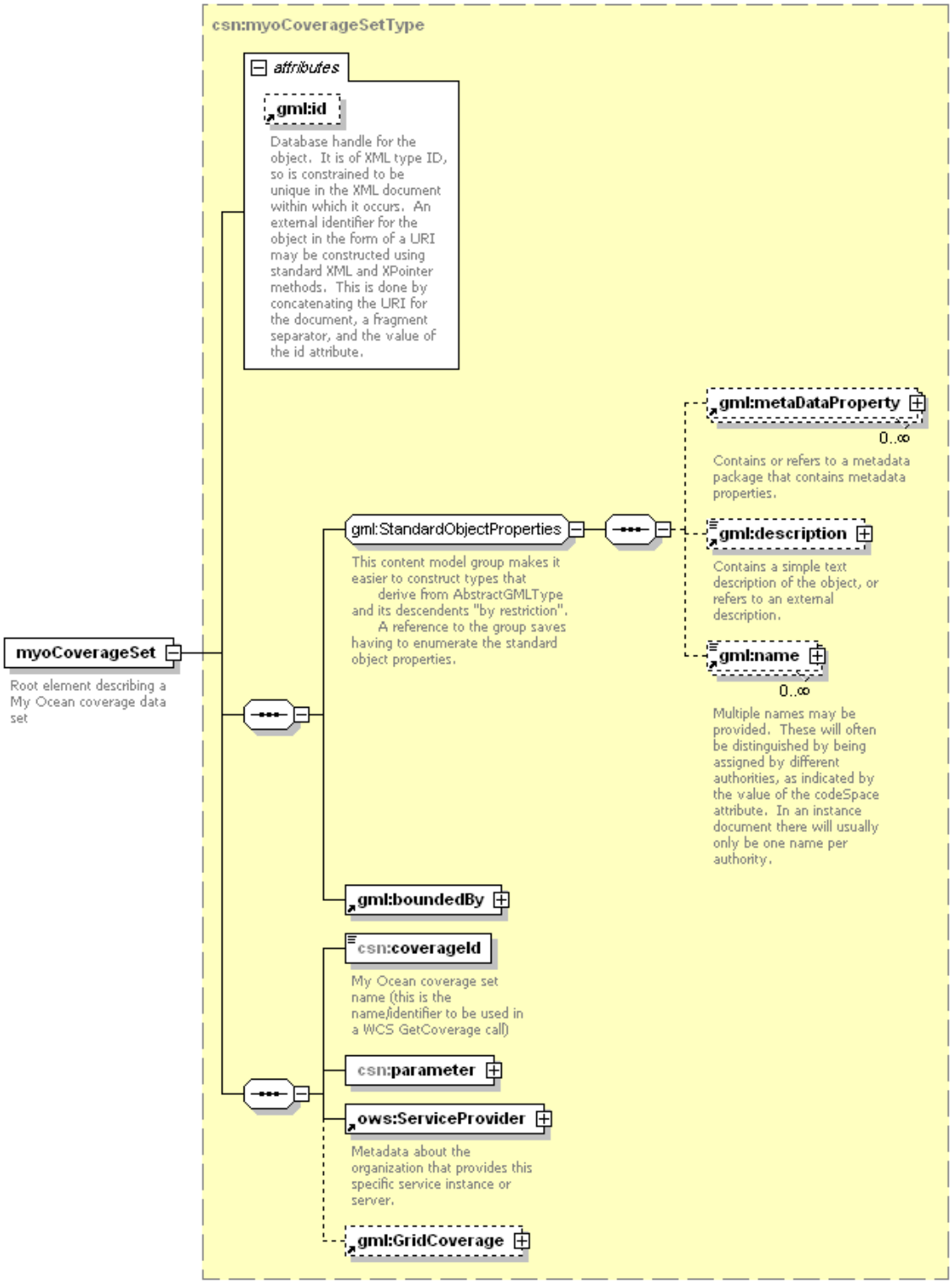
Schema csndc_myo.xsd

attribute form default: **unqualified**
element form default: **qualified**
targetNamespace: **http://www.emsa.europa.eu/csndc**

Elements	Complex types
myoCoverageSet	**myoCoverageSetType**
	myoFeatureType
	parameterType

element **myoCoverageSet**

diagram

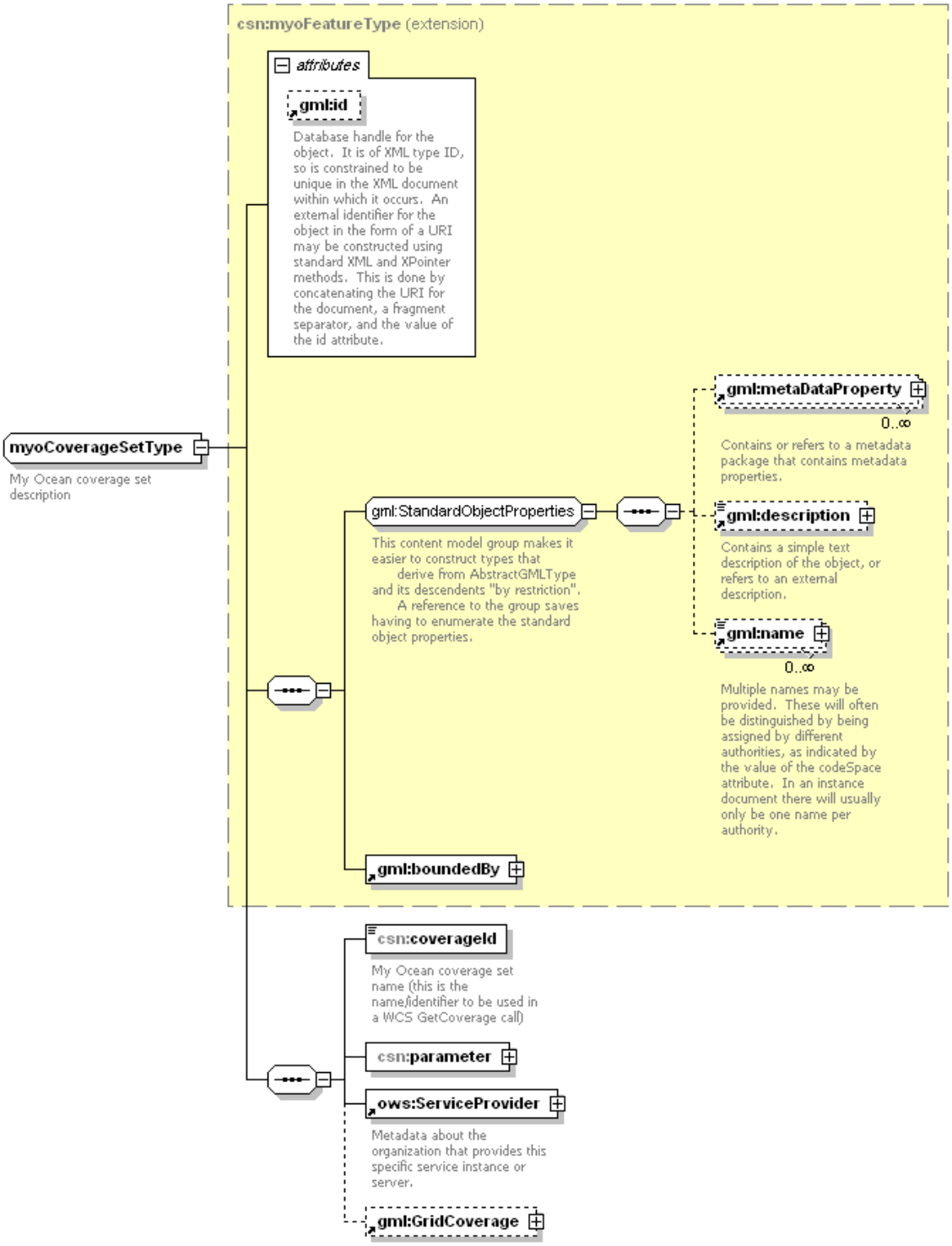


namespace	http://www.emsa.europa.eu/csndc
type	**csn:myoCoverageSetType**
properties	content complex substGrp gml:_Feature
children	**gml:metaDataProperty gml:description gml:name gml:boundedBy csn:coverageId csn:parameter ows:ServiceProvider gml:GridCoverage**

attributes	Name	Type	Use	Default	Fixed	annotation
	id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Root element describing a My Ocean coverage data set					
source	<xs:element name="myoCoverageSet" type="csn:myoCoverageSetType" substitutionGroup="gml:_Feature"> <xs:annotation> <xs:documentation>Root element describing a My Ocean coverage data set</xs:documentation> </xs:annotation> </xs:element>					

complexType **myoCoverageSetType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **csn:myoFeatureType**
properties	base csn:myoFeatureType
children	**gml:metaDataProperty gml:description gml:name gml:boundedBy csn:coverageId csn:parameter ows:ServiceProvider gml:GridCoverage**

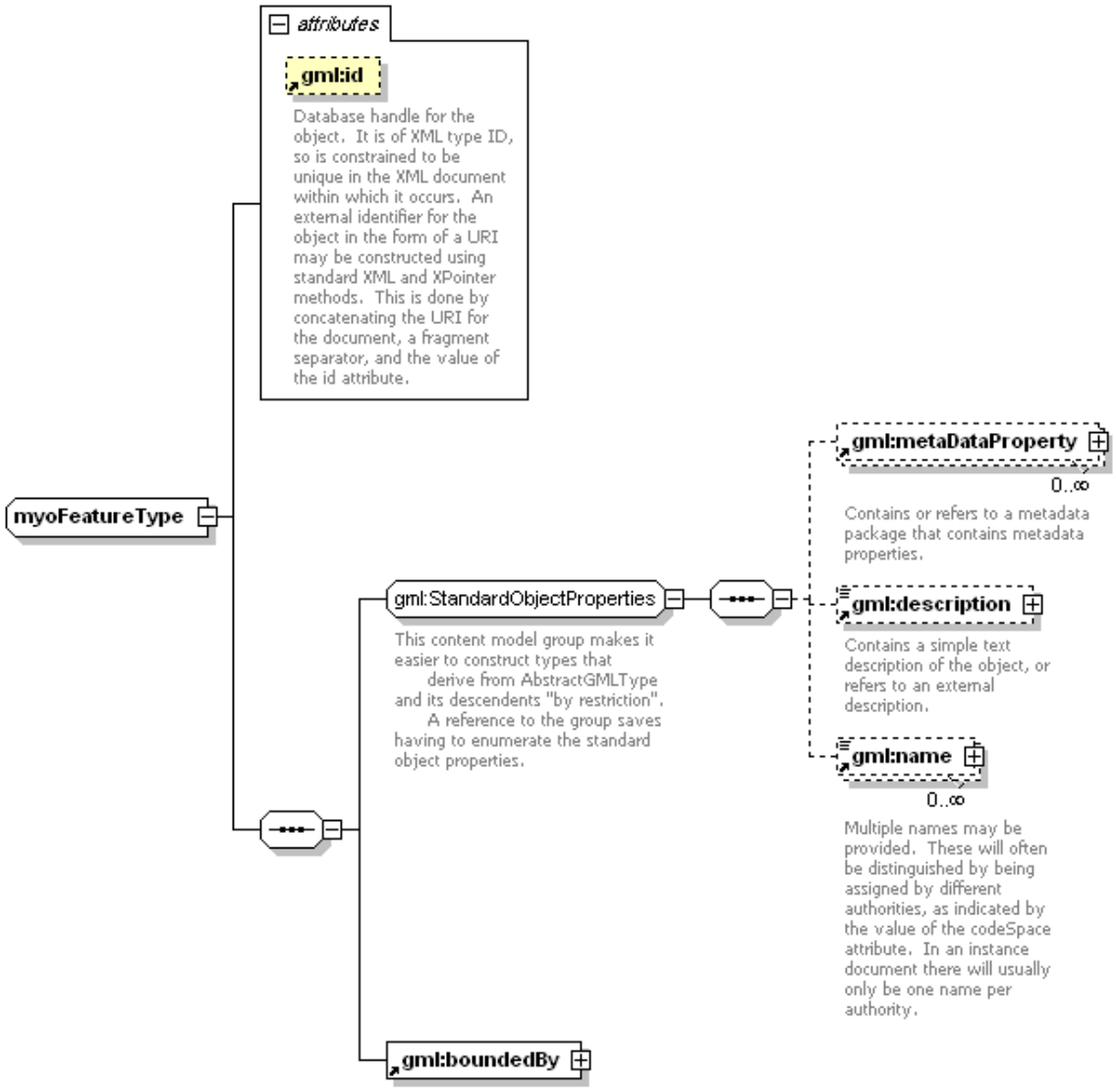
attributes

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation

		Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation My Ocean coverage set description	
source	<xs:complexType name="myoCoverageSetType"> <xs:annotation> <xs:documentation>My Ocean coverage set description</xs:documentation> </xs:annotation> <xs:complexContent> <xs:extension base="csn:myoFeatureType"> <xs:sequence> <xs:element name="coverageId" type="xs:string"> <xs:annotation> <xs:documentation>My Ocean coverage set name (this is the name/identifier to be used in a WCS GetCoverage call)</xs:documentation> </xs:annotation> </xs:element> <xs:element name="parameter" type="csn:parameterType"/> <xs:element ref="ows:ServiceProvider"/> <xs:element ref="gml:GridCoverage" minOccurs="0"/> </xs:sequence> </xs:extension> </xs:complexContent> </xs:complexType>	

complexType **myoFeatureType**

diagram



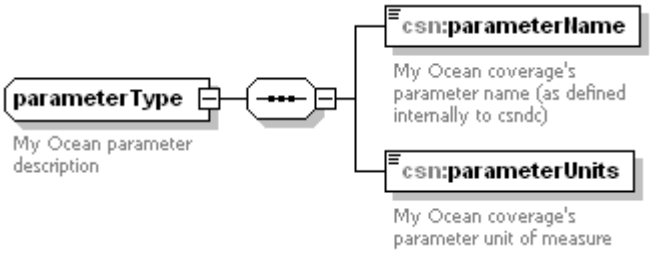
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **gml:AbstractFeatureType**
properties	base gml:AbstractFeatureType
children	**gml:metaDataProperty gml:description gml:name gml:boundedBy**

attributes

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external

	identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
source	<xs:complexType name="myoFeatureType"> <xs:complexContent> <xs:restriction base="gml:AbstractFeatureType"> <xs:sequence> <xs:group ref="gml:StandardObjectProperties"/> <xs:element ref="gml:boundedBy"/> </xs:sequence> </xs:restriction> </xs:complexContent> </xs:complexType>

complexType **parameterType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:parameterName csn:parameterUnits**
annotation	documentation My Ocean parameter description
source	<xs:complexType name="parameterType">\ <xs:annotation> <xs:documentation>My Ocean parameter description</xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="parameterName"> <xs:annotation> <xs:documentation>My Ocean coverage's parameter name (as defined internally to csndc)</xs:documentation> </xs:annotation>

```
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="concentration_of_chorophyll_a"/>
          <xs:enumeration value="sea_surface_temperature"/>
          <xs:enumeration value="sea_ice_area_fraction"/>
          <xs:enumeration value="sea_surface_currents"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="parameterUnits" type="xs:string">
      <xs:annotation>
        <xs:documentation>My Ocean coverage's parameter unit of measure</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

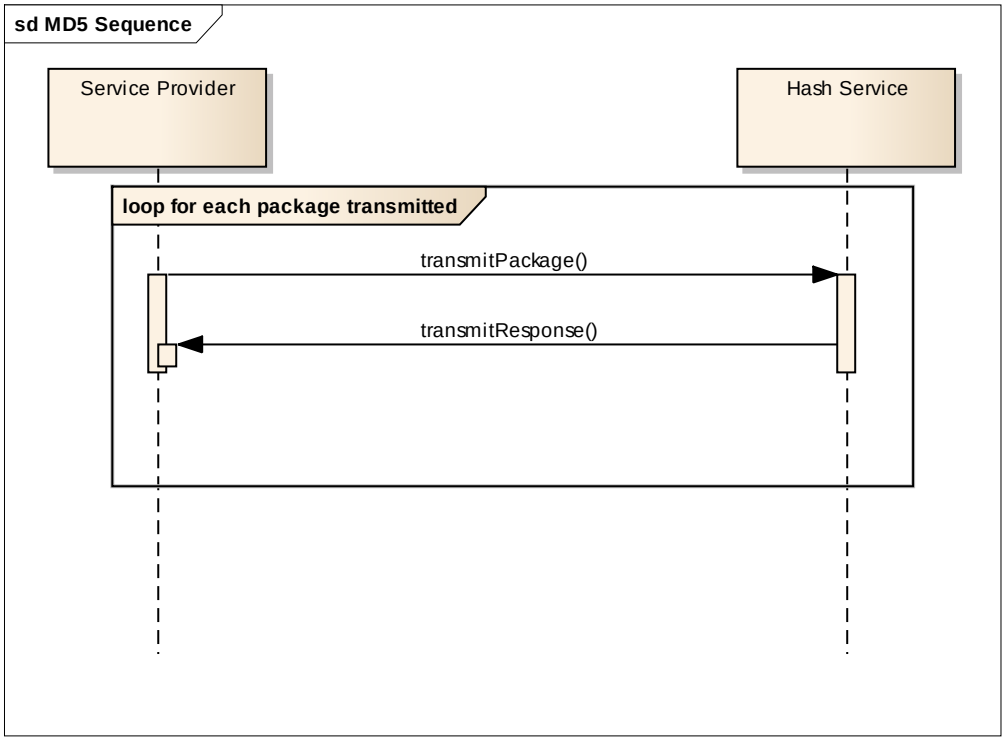
12 Annex G – SOAP message for SP packages list and checksum

The service endpoint is: https://csndc.emsa.europa.eu:443/javabridge/acs/csn_hash_server.php
The SOAP WSDL is reported hereafter.


```
This XML file does not appear to have any style information associated with it. The document tree is shown below.
<definitions xmlns:tns="http://localhost/Emsa/Emsa.wsdl" xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-
ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:csn="http://localhost/csn.xsd"
xmlns:SOAP="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:MIME="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:DIME="http://schemas.xmlsoap.org/ws/2002/04/dime/wsdl/"
xmlns:WSDL="http://schemas.xmlsoap.org/wsdl/" xmlns="http://schemas.xmlsoap.org/wsdl/" name="CSNDC"
targetNamespace="http://localhost/Emsa/Emsa.wsdl">
<types>
<schema xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-
ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:csn="http://localhost/csn.xsd"
xmlns="http://www.w3.org/2001/XMLSchema" targetNamespace="http://localhost/csn.xsd"
elementFormDefault="qualified" attributeFormDefault="unqualified">
<import namespace="http://schemas.xmlsoap.org/soap/encoding/"/>
<complexType name="VectorOfStrings">
<sequence>
<element ref="csn:PackageName" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
</complexType>
<complexType name="Package">
<sequence>
<element ref="csn:Filename" minOccurs="1" maxOccurs="1"/>
<element ref="csn:MD5" minOccurs="1" maxOccurs="1"/>
<element ref="csn:orderID" minOccurs="1" maxOccurs="1"/>
<element ref="csn:PackageList" minOccurs="1" maxOccurs="1"/>
</sequence>
</complexType>
<complexType name="TransmitRequest">
<sequence>
<element ref="csn:PackageData" minOccurs="0" maxOccurs="1"/>
</sequence>
</complexType>
<element name="PackageName" type="xsd:string"/>
<element name="Filename" type="xsd:string"/>
<element name="MD5" type="xsd:string"/>
<element name="orderID" type="xsd:int"/>
<element name="PackageList" type="csn:VectorOfStrings"/>
<element name="PackageData" type="csn:Package"/>
<element name="Response" type="xsd:string"/>
<element name="OutOfOrderList" type="csn:VectorOfStrings"/>
<element name="UnnotifiedPackages" type="csn:VectorOfStrings"/>
<element name="InputPackage" type="csn:TransmitRequest"/>
<!-- operation request element -->
```

```
<element name="TransmitPackage">
<complexType>
<sequence>
<element ref="csn:InputPackage" minOccurs="0" maxOccurs="1"/>
</sequence>
</complexType>
</element>
<!--  operation response element  -->
<element name="TransmitResponse">
<complexType>
<sequence>
<element ref="csn:Response" minOccurs="1" maxOccurs="1"/>
<element ref="csn:OutOfOrderList" minOccurs="1" maxOccurs="1"/>
<element ref="csn:UnnotifiedPackages" minOccurs="1" maxOccurs="1"/>
</sequence>
</complexType>
</element>
</schema>
</types>
<message name="TransmitPackage">
<part name="parameters" element="csn:TransmitPackage"/>
</message>
<message name="TransmitResponse">
<part name="parameters" element="csn:TransmitResponse"/>
</message>
<portType name="EmsaPortType">
<operation name="TransmitPackage">
<documentation>
Service definition of function csn__TransmitPackage
</documentation>
<input message="tns:TransmitPackage"/>
<output message="tns:TransmitResponse"/>
</operation>
</portType>
<binding name="Emsa" type="tns:EmsaPortType">
<SOAP:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
<operation name="TransmitPackage">
<SOAP:operation soapAction=""/>
<input>
<SOAP:body parts="parameters" use="literal"/>
</input>
<output>
<SOAP:body parts="parameters" use="literal"/>
</output>
</operation>
</binding>
<service name="Emsa">
<documentation>MD5 Service</documentation>
<port name="Emsa" binding="tns:Emsa">
<SOAP:address location="http://twls11/javabridge/acs/csn_hash_server.php"/>
</port>
</service>
</definitions>
```

The sequence for mesage exchange is quite simple, as illustrated in the following sequence diagram.



For each package to be transmitted, the SP sends the TransmitPackage message to the service and receives in response a message. Typically an acqknowledge.
On the last package transmitted, in the message body the SP shall include the list of packages previously sent so that the Hash Service can compare the list against the data already sent for the same service ID and, possibly, send a warning message in case the list provided in the last message does not match with the list of files sent in the individual messages. The details business rules are explained below.

SOAP Request example:

```
POST /WUP HTTP/1.1
Host: www.emsa.europa.eu
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn

<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">
      <soap:Body xmlns:csn="http://www.emsa.europa.eu/csndc">
         <csn:TransmitPackage>
          <csn:InputPackage>
           <csn:PackageData>
             <csn:Filename>APC0_20092333_200932223....._QR</csn:Filename>
             <csn:MD5>d41d8cd98f00b204e9800998ecf8427e</csn:MD5>
             <csn:OrderID>232112</csn:OrderID>
             <csn:PackagesList>
      <csn:PackageName>APC0_20092333_200932223....._OW </csn:PackageName>
      <csn:PackageName>APC0_20092333_200932223....._EO</csn:PackageName>
      …
```

```
      <csn:PackageName>APC0_20092333_200932223....._QR</csn:PackageName>
            </csn:PackagesList>
          </csn:PackageData>
         </csn:InputPackage>
       </csn:TransmitPackage>
      </soap:Body>
</soap:Envelope>
```

The <PackageList> element is optional and is only filled with the last package of the transmission (tipically the Quality Report one). It is the list of all the package file names belonging to the same “transmission” (i.e. the same event processing).

```
HTTP/1.1 200 OK
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn
```

SOAP Response example:

```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">
      <soap:Body xmlns:csn="http://www.emsa.europa.eu/csndc">
            <csn:Response>ACK</csn:Response>
      </soap:Body>
</soap:Envelope>
```

The business logic for this service is reported herafter:

- The SOAP service shall be invocked by the SPs before sending a data package for ALL data package types belonging to a service ID, to announce the time when the data package is actually available at the source
- The SOAP service shall indicate the following elements:
  - Mandatory:
    - Filename of the package
    - Service ID
    - MD5 of the file to be transmitted
  - Mandatory:
    - A list of package names: this list is only provided when the **last package** of a given service ID is sent. The usage is twofold:
      - If the list is present it indicates that this is the **last package** of the given service ID to be sent, thus the connection for that service can be closed
      - The list of packages provided in this message is chacked against the list of packages already sent by the SP. In the response message, the SOAP service will return any possible discrepancy between the list of packages sent before this last package and the list provided in this message, in particular:
        - If packages were sent but not included in the final list of packages, they will be included in the **OutOfOrderList** element
        - If packages were not sent previously, but included in the final list, they will be listed in the **UnnotifiedPackages** element

12.1 Non-nominal usage examples and error cases

Here follow a number of possible non nominal examples of usage of this service.

12.1.1 Package already notified

This is an example of message sent that duplicates a package already notified. In this case, there will be no error, but a simple acknowledge.
NOTE: in case the Filename is equal to a filename already sent, but the MD5 is different, this request will replace the previous request.

12.1.1.1 Request

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:csn="http://localhost/csn.xsd">
  <soapenv:Header/>
  <soapenv:Body>
    <csn:TransmitPackage>
      <!--Optional:-->
      <csn:InputPackage>
        <!--Optional:-->
        <csn:PackageData>

<csn:Filename>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_EOP.zip</csn:Fil
ename>
          <csn:MD5>a32e765af1da720b2c1be967a6ebd930</csn:MD5>
          <csn:orderID>5667</csn:orderID>
          <csn:PackageList>
            <!--Zero or more repetitions:-->

          </csn:PackageList>
        </csn:PackageData>
      </csn:InputPackage>
    </csn:TransmitPackage>
  </soapenv:Body>
</soapenv:Envelope>
```

12.1.1.2 Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://localhost/csn.xsd">
  <SOAP-ENV:Body>
    <ns1:TransmitResponse>
      <ns1:Response>ACK</ns1:Response>
      <ns1:OutOfOrderList/>
      <ns1:UnnotifiedPackages/>
    </ns1:TransmitResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.1.2 Wrong filename format

This is an example where the filename does not follow the CSNDC naming convention.

12.1.2.1 Request

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:csn="http://localhost/csn.xsd">
  <soapenv:Header/>
  <soapenv:Body>
    <csn:TransmitPackage>
      <!--Optional:-->
      <csn:InputPackage>
        <!--Optional:-->
        <csn:PackageData>

<csn:Filename>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_EOS.zip</csn:Fil
ename>
          <csn:MD5>a32e765af1da720b2c1be967a6ebd930</csn:MD5>
          <csn:orderID>5667</csn:orderID>
          <csn:PackageList>
            <!--Zero or more repetitions:-->

          </csn:PackageList>
        </csn:PackageData>
      </csn:InputPackage>
    </csn:TransmitPackage>
  </soapenv:Body>
</soapenv:Envelope>
```

12.1.2.2 Response

The response will indicate the error in the filename convention.

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://localhost/csn.xsd">
  <SOAP-ENV:Body>
    <ns1:TransmitResponse>
      <ns1:Response>ERROR: Filename must adhere to the correct naming convention</ns1:Response>
      <ns1:OutOfOrderList/>
      <ns1:UnnotifiedPackages/>
    </ns1:TransmitResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.1.3 Invalid Order Id

In case the service ID does not exist, the service will return a response message like the following.

12.1.3.1 Request

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:csn="http://localhost/csn.xsd">
  <soapenv:Header/>
  <soapenv:Body>
    <csn:TransmitPackage>
      <!--Optional:-->
      <csn:InputPackage>
        <!--Optional:-->
        <csn:PackageData>

<csn:Filename>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_EOP.zip</csn:Fil
ename>
          <csn:MD5>a32e765af1da720b2c1be967a6ebd930</csn:MD5>
          <csn:orderID>56671</csn:orderID>
          <csn:PackageList>
            <!--Zero or more repetitions:-->

          </csn:PackageList>
        </csn:PackageData>
      </csn:InputPackage>
    </csn:TransmitPackage>
  </soapenv:Body>
</soapenv:Envelope>
```

12.1.3.2 Response

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://localhost/csn.xsd">
  <SOAP-ENV:Body>
    <ns1:TransmitResponse>
      <ns1:Response>ERROR: Invalid OrderId (56676)</ns1:Response>
      <ns1:OutOfOrderList/>
      <ns1:UnnotifiedPackages/>
    </ns1:TransmitResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

12.1.4 Incorrect List of Packages

This case is an example where in the service call associated to the last package of a given service ID, the list of packages ise sent that does nto match exactly the list of packages received (including the package sent in this message.

Assuming that the following package types had already been announced before for the Service ID 5667:

- 5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_QNO.zip
- 5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_OSN.zip
- 5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_QUA.zip
- 5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_DER.zip

12.1.4.1 Request

In this request, the list of packages is sent, thus indicating that this is the last package of a sequence for that service ID. The list of package does not exactly match the list of packages already received.

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:csn="http://localhost/csn.xsd">
  <soapenv:Header/>
  <soapenv:Body>
    <csn:TransmitPackage>
      <!--Optional:-->
      <csn:InputPackage>
        <!--Optional:-->
        <csn:PackageData>

<csn:Filename>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_EOP.zip</csn:Fil
ename>
          <csn:MD5>a32e765af1da720b2c1be967a6ebd671</csn:MD5>
          <csn:orderID>5667</csn:orderID>
          <csn:PackageList>
            <!--Zero or more repetitions:-->

<csn:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_EOP.zip</c
sn:PackageName>
<csn:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_QNO.zip</c
sn:PackageName>
<csn:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_OSW_1.zip
</csn:PackageName>
<csn:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_QUA.zip</c
sn:PackageName>
<csn:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_DER.zip</c
sn:PackageName>
          </csn:PackageList>
        </csn:PackageData>
      </csn:InputPackage>
    </csn:TransmitPackage>
  </soapenv:Body>
</soapenv:Envelope>
```

12.1.4.2 Response

The response is positive, but it indicates the mismatch between the announced packages and the packages listed in the last message. In particular:

- QNO package should have been notified and was not
- OSW_1 was notified but it is not in the final list indicated in the last message


```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://localhost/csn.xsd">
  <SOAP-ENV:Body>
    <ns1:TransmitResponse>
      <ns1:Response>ACK</ns1:Response>
      <ns1:OutOfOrderList>


<ns1:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_QNO.zip</n
s1:PackageName>


<ns1:PackageName>5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131_OSW_1.zip
</ns1:PackageName>
      </ns1:UnnotifiedPackages>
    </ns1:TransmitResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

13 Annex H – Template for Service or licence Orders

Services or licences are ordered through tasking forms automatically generated and digitally signed when the authorising officer approves the order in the Financial System of the CSNDC.
The tasking form gives the list of services or licences that have to be provided.
Here follow an example of tasking form.

CSN Task Form Number	2570
CSN Task Form Date	2014/08/18 14:51:13
CSN Services	
Year / Month	2014 / August
Service Provider	Ksat

Sequence Number	Specific Order ID	Project	Satellite	Sensor Mode	Service Type	Notification	Tasking Area	Size	Acquisition Date
1	135549	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247384.39033	2014/08/01 05:18:23
2	135550	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247406.72803	2014/08/01 16:44:51
3	135551	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247229.09165	2014/08/02 16:16:42
4	135552	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247434.81624	2014/08/04 05:31:19
5	135553	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247414.06321	2014/08/04 16:57:24
6	135554	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247242.06982	2014/08/05 05:00:36
7	135555	CleanSeaNet	RADARSAT-2	SCNA	CSW-RUN4		Planning area 1	85190.79214	2014/08/06 15:59:26
8	135556	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247108.1031	2014/08/08 05:12:09
9	135557	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247252.23618	2014/08/08 05:13:16
10	135558	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247410.06378	2014/08/08 16:40:38
11	135559	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247347.82051	2014/08/09 16:11:40
12	135560	CleanSeaNet	RADARSAT-2	SCWA	CSW-RUN4		Planning area 1	247432.0	2014/08/11

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14 Annex I – Template for Satellite Data Licenses

TBW

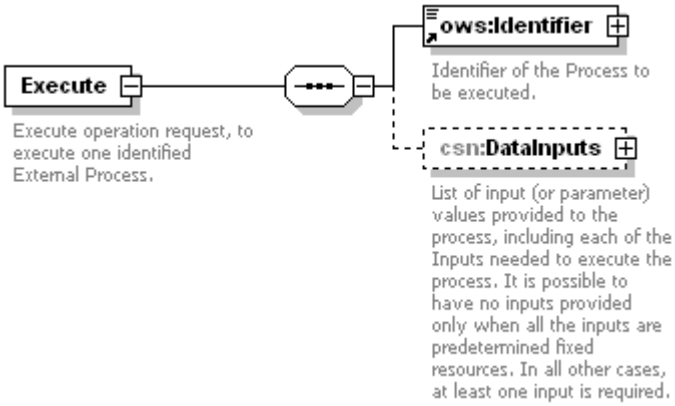
15 Annex J – Process request XML schema

Schema available at http://schemas.opengis.net/wps/1.0.0/wpsExecute_request.xsd.

attribute form default:
element form default: **qualified**
targetNamespace: **http://www.emsa.europa.eu/csndc**

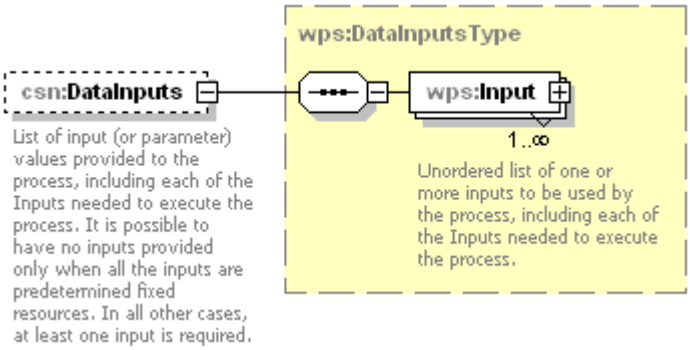
Elements
Execute

element **Execute**

diagram	
namespace	http://www.emsa.europa.eu/csndc
properties	content complex
children	**ows:Identifier csn:DataInputs**
annotation	documentation Execute operation request, to execute one identified External Process.
source	<element name="Execute"> <annotation> <documentation>Execute operation request, to execute one identified External Process. </documentation> </annotation> <complexType> <sequence> <element ref="ows:Identifier"> <annotation> <documentation>Identifier of the Process to be executed.</documentation> </annotation> </element> <element name="DataInputs" type="wps:DataInputsType" minOccurs="0"> <annotation> <documentation>List of input (or parameter) values provided to the process, including each of the Inputs needed to execute the process. It is possible to have no inputs provided only when all the inputs are predetermined fixed resources. In all other cases, at least one input is required.

	</documentation> </annotation> </element> </sequence> </complexType> </element>

element **Execute/DataInputs**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**wps:DataInputsType**
properties	isRef 0 minOcc 0 maxOcc 1 content complex
children	**wps:Input**
annotation	documentation List of input (or parameter) values provided to the process, including each of the Inputs needed to execute the process. It is possible to have no inputs provided only when all the inputs are predetermined fixed resources. In all other cases, at least one input is required.
source	<element name="DataInputs" type="wps:DataInputsType" minOccurs="0"> <annotation> <documentation>List of input (or parameter) values provided to the process, including each of the Inputs needed to execute the process. It is possible to have no inputs provided only when all the inputs are predetermined fixed resources. In all other cases, at least one input is required. </documentation> </annotation> </element>

As can be seen, the XML format refers to the OGC WPS 1.0.0 format specification of the Execute operation. Nevertheless, not all the options of the WPS 1.0.0 are used.
Following tables report the specification of the WPS !.0.0 Execute DataInputs element used in CSNDC along with its usage and the list of specific input parameters.

DataInputs element has following data structure:

Name	Definition	Data Type	Multiplicity and use
Input	Value of input to this process execution	InputType data structure (see	One or more (mandatory).

		below)	One for each input, unordered.

InputType element has following data structure:

Name	Definition	Data Type	Multiplicity and use
Identifier	Name of the parameter	String Possible values are reported below.	One (mandatory)
InputDataFormChoice	Identifies the type of this input. In CSNDC, only Literal Data are supported.	InputDataFormChoice data structure (see below)	One (mandatory)

InputDataFormChoice element has following data structure:

Name	Definition	Data Type	Multiplicity and use
Data	Identifies this input data as begin encapsulated in the Execute request	DataType data structure (see below)	One (mandatory)

Data element has following data structure:

Name	Definition	Data Type	Multiplicity and use
LiteralData	Identifies this input data as a literal data encoded in a character string	Not empty string. Includes attributes as per table below.	One (mandatory)

LiteralData has following attributes:

Name	Definition	Data Type	Multiplicity and use
DataType	Data type of this literal value	String	Zero or one (optional)
Uom	Unit of measure	URI	Zero or one (optional)

For each model there will be a set of standard input parameters, which will be used for the “automatic mode” and for the “On demand Mode”. The model shall support all values in the “Automatic mode”, however some parameters in the “on demand mode” might not be supported by some models.

The list of Input Parameters is as follows:

Input identifier	Type	Default values

		(overwritten by the standard input parameters if available)
Automatic Mode and "On demand mode":		
Oil_class	List of values as defined by model operator	a default will be provided by the model owner - not locked to a specific detailed type
Time_forward_modelling	hours	72 hours
Time_backward_modelling	hours	24 hours
Time_step	hours	Default 15 min
Number_of_particles	List of possible numbers as defined by model operator	A default shall be provided by the model owner
Additional parameters for "On demand Mode" only		
Model_identifier	List of values as defined by model operator	If not given, always the most recent version is used
Trajectory_of_Centre_of_gravity	Yes /no	Default: no
Trajectory_of_Particles	Yes /no	Default: yes if supported by the model
Oil_type	List of values as defined by model operator	Overwrites the values chosen by the Oil class
Scenario_name	text	
Scenario_description	text	
Prediction	forward / backward / both	Default both
Outlet_depth	m	If not given, a default shall be defined by the model owner - surface (0m) is a good value
Density	Kg/m3 -Floating point number	Overwrites the values chosen by the Oil class / type
Viscosity	Floating point number	Overwrites the values chosen by the Oil class / type
State_of_oil	fresh/weathered	If not given, a default shall be defined by the model owner - fresh is a good value
Discharge_instantaneous	Floating point number	Amount – in m3 If not given, a default shall be defined by the model owner - 100m3 is a good value.
Discharge_continuous_total_from	Date time	If not given, no continuous discharge is assumed
Discharge_continuous_total_duration	hours	If not given, no continuous discharge is assumed
Discharge_continuous_total_amount	m3/hour	If not given, no

		continuous discharge is assumed
Oil_thickness	Floating point number	Expressed in m
Calculation_info; Calculation_name, other info	text	

16 Annex K – Templates for Warning and Alerting messages (Not used)

1. CSN Warnings: Oil spill rapid warnings dispatched per spill with very high likelihood of catching a polluter red-handed.

SMS Content description:

"EMSA CleanSeaNet warning"
<Date and time of satellite overpass>
"Poss. Polluter at: "<Position >
"<http address>"

MMS Content description:

Same content as SMS + clip image

Estimated no. of SMS/MMS messages per year: 1000 SMS/MMS sent to 2 different telephone numbers.

Estimated no. of SMS/MMS messages per satellite acquisition: Max. 5 SMS/MMS sent to 2 different telephone numbers.

2. CSN Alerts: Oil spill alerts dispatched per analysis of satellite image, containing summary of all Oil Spill Notifications (OSN's).

SMS Content description:

"EMSA CleanSeaNet Alert"
<Date and time of satellite overpass>
If 1 to n Class A spills have been detected:
"<N> OSN class A"
If 1 to n class B spills have been detected:
"<N> OSN class B"
If no spills have been detected
"No OSN"
"<http address>"

MMS Content description:

"EMSA CleanSeaNet Alert"
<Date and time of satellite overpass>
If 1 to n Class A spills have been detected:
"OSN class A at: "<Position 1, length 1, width 1, area 1 > ..<position n, length,, width n, area n>"
If 1 to n class B spills have been detected:
"OSN class B at: "<Position 1, length 1, width 1, area 1 > ..<position n, length,, width n, area n>"
If no spills have been detected
"No OSN"
"<http address>"
Situation map

Estimated no. of SMS/MMS messages per year: 2500 SMS/MMS sent to 5 different telephone numbers.

Estimated no. of SMS/MMS messages per satellite acquisition: Max 5 SMS/MMS sent to 5 different telephone numbers.

17 Annex L – *(blank)*

18 Annex M – Naming conventions

A set of packages related to the processing of a given EO product constitutes a “transmission”.
Packages of a transmission are thus directly or indirectly related to a given EO product.

Image unique identifier
The unique identifier for the image is build with the following rule:

<image_id> **=** *<service_id>_<image_name>*

Where:
<service_id> is the unique identifier of the service assigned by CSN DC at the time of the ordering process

<image_name> is the product name assigned to the scene by the Satellite Operator

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA

Please note:
- The image identifier is used in the naming convention of any package AND in the GML files itself
- The *<image_name>* is defined outside the CSN DC context and is not unique in itself; it could also include underscores (_) and dots (.). This is managed by the CSN DC.
- It is up to the CSN DC to build a valid OGC compliant URN based on the image unique identifier specified here.

OS identifier
The identifier of an Oil Spill shall match the following rule:

<os_id> = *<image_id>*_ OS_*<os_num>*

Where:
<os_num> is a progressive number from 1 to N being N the total number of Oil Spills detected in the same image *<image_id>*

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_OS_2

Please note:
- The OS identifier is used in the GML files as identifier of the Oil Spill
- It is up to the CSN DC to build a valid OGC compliant URN based on the oil spill identifier specified here.

Detected Ship identifier
The identifier of a Detected Ship shall match the following rule:

<ds_id> = *<image_id>*_ DS_*<ds_num>*

Where:
<ds_num> is a progressive number from 1 to N being N the total number of vessels detected in image *<image_id>*

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_DS_32

Please note:
- The detected ship identifier is used in the GML files as identifier of a Detected Ship
- It is up to the CSN DC to build a valid OGC compliant URN based on the detected ship identifier specified here.

Package file name
The package file name shall match the following rule:

<image_id>_<package_type>.<extension>

Where:
<package_type> is a code for package type. Following codes are valid:

- EOP for EO Product RADAR/Optical package type **NOTE**: to ensure compatibility with the release 1.7 of CSNDC, for optical data **ONLY** the extension shall be EOPO and not EOP.
- OSW_[*progressive_num*] for OS Warning package type
- OSN for OS Notification package type
- DER for SAR derived package type
- QUA for Quality report package type
- QNO for Quality notification package type
- OSP for Oil Spill Predicted
- ACT for Activity Package type

[*progressive_num*] is a progressive number starting from 1 that has to be specified only in the case of OSW packages (since OSW packages can be more than one for a given transmission). Please note that in case of a single OSW package for the transmission, its package_type is "OSW_1"

<extension> is a valid file format extension for the package as defined in section 2 (e.g. tgz)

Examples:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_EOP.tgz

123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_OSN.tgz

123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_OSW_1.tgz

For the **EOP optical data**, the following more stringent rule shall be matched.

*<image_id>_**<Platform><Product type>_OPT**_<package_type>.<extension>*

Where:
<Platform> indicates the Optical sensor (3 characters)
< Product type> indicates the product type (3 characters)

They are extracted from the values in the 2 tables below.

For the CSNDC processing it is fundamental to extract platform and product type

The **platform** is extracted from the following XPath in the EOP.xsd:

/eop:EarthObservation/gml:using/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:shortName

The following values are expected for the sensor:

Platform	Description
ERB	Eros_B
GE1	GeoEye-1
IKN	Ikonos
QB	Quickbird
WV1	Worldview-1
WV2	Worldview-2

where the product type is extracted from the following XPath of the EOP.xml

/eop:EarthObservation/gml:metaDataProperty/eop:EarthObservationMetaData/eop:productType

And must comply with the following values

Product type	Description
B08	Level1B 8 bit
B16	Level1B 16 bit
RGB	NaturalColor
4BP	4BandPansharpened
4BB	4BandBundle
PAN	Panchromatic
8BB	8BandBundle

example:

12345_ERBLBB-E2334045_ERBB08_OPT_EOP.tgz

Indicates an Eros B Level1 B 8 but file type.

Package info XML file name
Package info XML file name in any single package shall match the following rule:

<*image_id*>_PCK.xml

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_PCK.xml

EO Product GML file name

There are 2 different naming conventions for RADAR and for OPTICAL data.
RADAR Data

An EO Product GML file name shall match the following rule:

<image_id>_EOP.xml

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_EOP.xml

OPTICAL Data

An EO Product GML file name shall match the following rule:

<image_id>_OPT_EOP.xml

example:

12345_ERBLBB-E2334045_OPT_EOP.xml

Indicates an Eros B Level1 B 8 but file type.

Oil Spill feature GML file name
An Oil Spill feature GML file name shall match the following rule:

<os_id>_<nw_type>.xml

Where:
<nw_type> is a 3 chars code for the type of dataset (notification/warning):
OSW for OS Warning type
OSN for OS Notification type

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_OS_2_OSN.xml

Detected Ship feature GML file name
A detected ship GML file name shall match the following rule:

<ds_id>.xml

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_DS_32.xml

Image Quality notification file name
An Image Quality notification file name shall match the following rule:

*<image_id>*_QN.xml

Example:

123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_QN.xml

Please note: <*image_id*>_QN is also the unique identifier of the QN to be reported into the QN ZML file.

Quality Report file name
An Image Quality report file name shall match the following rule:

<*image_id*>_QR.xml

Example:
123_ASA_WSM_1PNACS20100603_203524_000000592090_00043_43183_0001.N1.00114_EMSA_QR.xml

EO Native Image file
No specific naming convention is used. The original Satellite Operator's name can be used. In any case the file extension must match the original format extension (e.g. '.N1' for ENVISAT ASAR).

Clip Image File name, EO Browse image file name, Not Analyzable Area Mask file name and Sar extracted NetCDF file name
No specific naming convention is used. The file names must be unique in the frame of the package they belongs to.

Predicted Oil Spill file name

A predicted oil spill file name shall match the following rule:

- *<image_id> is the Id of the original image, as received from EMSA*
- *<model_identifier> is a code for the model, as specified by the Model Provider*
- *<run_id> identifier of the run, as specified in input elements*
- *<package_type> is a code for package type. OSP for Oil Spill Predicted*

Example name:

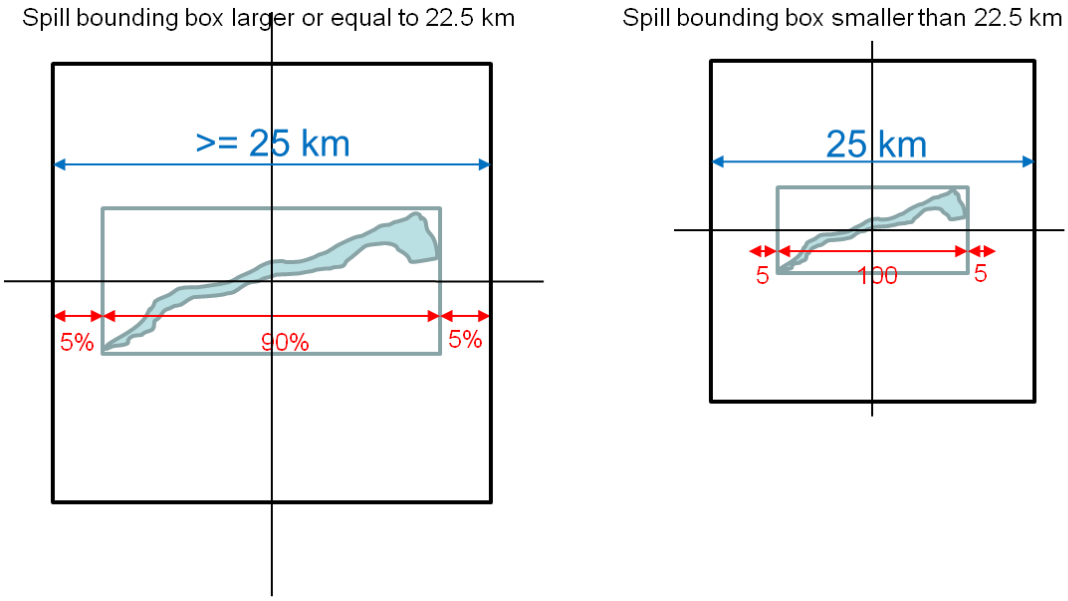
124026_RS2_20121218_060041_0060_SCWB_VV_SCW_234730_0000_0000000_MODELMX_1_OSP.zip

19 Annex N – Clip Images

The clip image shall be produced by the service providers as a GEOTIFF image in UTM projection.

Zoom Level of Clip Images

The clip image itself shall be a square covering a minimum area of 25 km by 25 km. The clip image shall be in full resolution. The clip image shall contain the bounding box of the spill (NS – EW) + a margin applied to each side of the longest side. The clip image shall be centred on the centre of the bounding box of the oil spill polygon.
It should be noted that, if the bounding box of the spill exceeds 22.5 km in either NS or EW direction, then the area of the clip image has to be increased accordingly as presented in the figure below.



The same paradigm is used by the CleanSeaNet data centre to generate the map. This is required in order for the clip image and the map to display the same area at the same scale.

20 Annex O – Model Output description schema

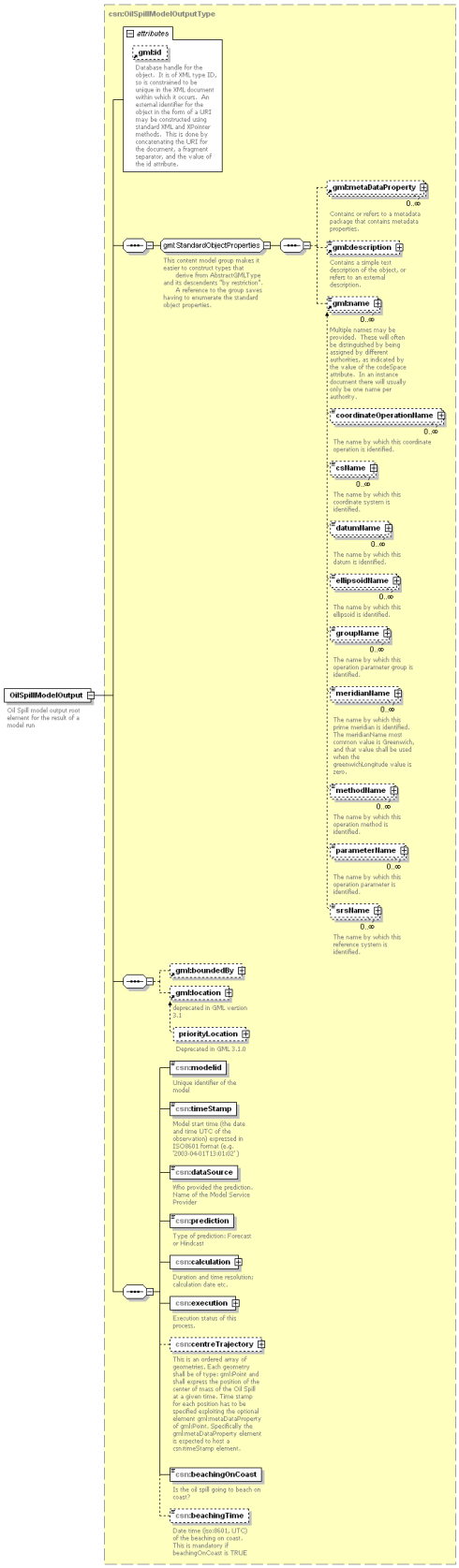
Schema csndc_msp_output.xsd

attribute form default:	**unqualified**
element form default:	**qualified**
targetNamespace:	**http://www.emsa.europa.eu/csndc**

Elements	Complex types
OilSpillModelOutput	**ExecutionStatusType**
	OilSpillModelCalculationType
	OilSpillModelContinuousDischargeType
	OilSpillModelDischargeType
	OilSpillModelOutputType

element **OilSpillModelOutput**

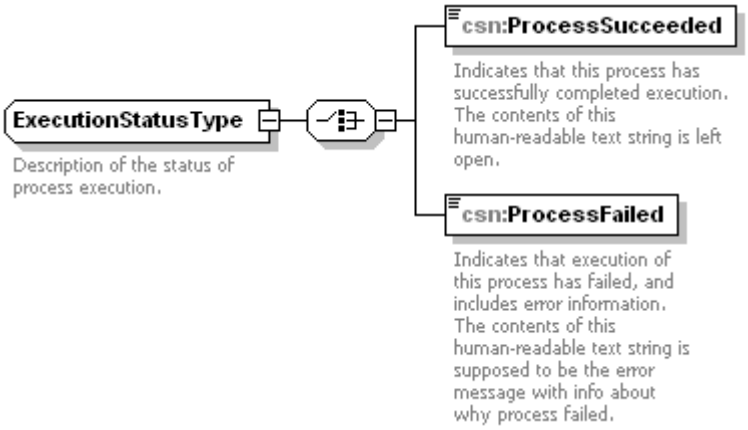
diagram



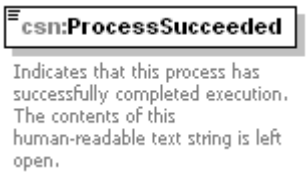
namespace	http://www.emsa.europa.eu/csndc
type	**csn:OilSpillModelOutputType**

properties	content complex substGrp gml:_Feature
children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location csn:modelid csn:timeStamp csn:dataSource csn:prediction csn:calculation csn:execution csn:centreTrajectory csn:beachingOnCoast csn:beachingTime**
attributes	Name Type Use Default Fixed annotation id optional documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Oil Spill model output root element for the result of a model run
source	<xs:element name="OilSpillModelOutput" type="csn:OilSpillModelOutputType" substitutionGroup="gml:_Feature"> <xs:annotation> <xs:documentation>Oil Spill model output root element for the result of a model run</xs:documentation> </xs:annotation> </xs:element>

complexType **ExecutionStatusType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	**csn:ProcessSucceeded** **csn:ProcessFailed**
used by	element **OilSpillModelOutputType/execution**
annotation	documentation Description of the status of process execution.
source	<xs:complexType name="ExecutionStatusType"> <xs:annotation> <xs:documentation>Description of the status of process execution. </xs:documentation> </xs:annotation> <xs:choice> <xs:element name="ProcessSucceeded" type="xs:string"> <xs:annotation> <xs:documentation>Indicates that this process has successfully completed execution. The contents of this human-readable text string is left open. </xs:documentation> </xs:annotation> </xs:element> <xs:element name="ProcessFailed" type="xs:string"> <xs:annotation> <xs:documentation>Indicates that execution of this process has failed, and includes error information. The contents of this human-readable text string is supposed to be the error message with info about why process failed.</xs:documentation> </xs:annotation> </xs:element> </xs:choice> </xs:complexType>

element **ExecutionStatusType/ProcessSucceeded**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**

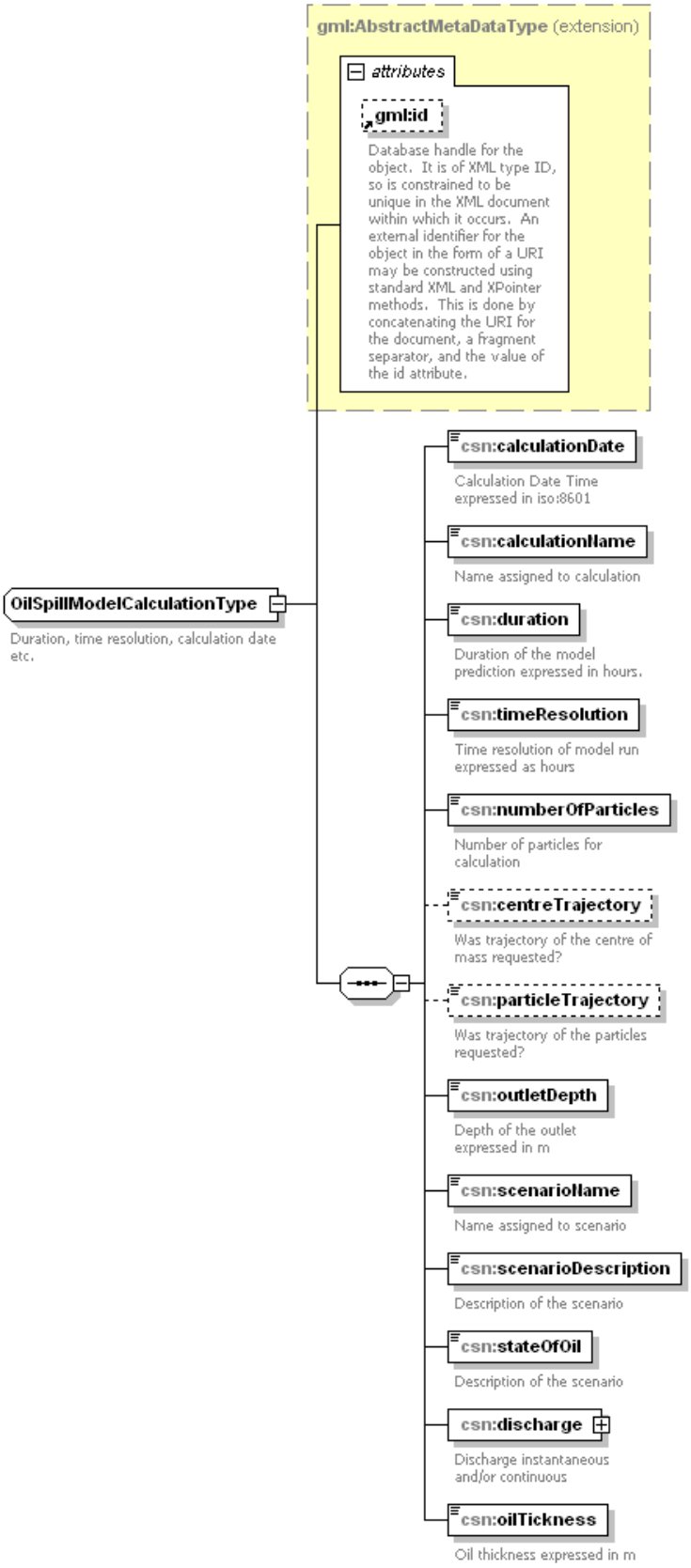
properties	isRef 0 content simple
annotation	documentation Indicates that this process has successfully completed execution. The contents of this human-readable text string is left open.
source	<xs:element name="ProcessSucceeded" type="xs:string"> <xs:annotation> <xs:documentation>Indicates that this process has successfully completed execution. The contents of this human-readable text string is left open. </xs:documentation> </xs:annotation> </xs:element>

element **ExecutionStatusType/ProcessFailed**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple
annotation	documentation Indicates that execution of this process has failed, and includes error information. The contents of this human-readable text string is supposed to be the error message with info about why process failed.
source	<xs:element name="ProcessFailed" type="xs:string"> <xs:annotation> <xs:documentation>Indicates that execution of this process has failed, and includes error information. The contents of this human-readable text string is supposed to be the error message with info about why process failed.</xs:documentation> </xs:annotation> </xs:element>

complexType **OilSpillModelCalculationType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractMetaDataType**

properties	base gml:AbstractMetaDataType mixed true
children	csn:calculationDate csn:calculationName csn:duration csn:timeResolution csn:numberOfParticles csn:centreTrajectory csn:particleTrajectory csn:outletDepth csn:scenarioName csn:scenarioDescription csn:stateOfOil csn:discharge csn:oilTickness
used by	element OilSpillModelOutputType/calculation
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Input calculation parameters (Duration, time resolution, calculation date etc.)

source

```
<xs:complexType name="OilSpillModelCalculationType" mixed="true">
  <xs:annotation>
    <xs:documentation>Duration, time resolution, calculation date etc.</xs:documentation>
  </xs:annotation>
  <xs:complexContent mixed="true">
    <xs:extension base="gml:AbstractMetaDataType">
      <xs:sequence>
        <xs:element name="calculationDate" type="xs:dateTime">
          <xs:annotation>
            <xs:documentation>Calculation Date Time expressed in iso:8601</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="calculationName" type="xs:string">
```

```
      <xs:annotation>
        <xs:documentation>Name assigned to calculation </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="duration" type="xs:double">
      <xs:annotation>
        <xs:documentation>Duration of the model prediction expressed in hours.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="timeResolution" type="xs:double">
      <xs:annotation>
        <xs:documentation>Time resolution of model run expressed as hours</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="numberOfParticles" type="xs:string">
      <xs:annotation>
        <xs:documentation>Number of particles for calculation</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="centreTrajectory" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Was trajectory of the centre of mass requested?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="particleTrajectory" type="xs:boolean" minOccurs="0">
      <xs:annotation>
        <xs:documentation>Was trajectory of the particles requested?</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="outletDepth" type="xs:double">
      <xs:annotation>
        <xs:documentation>Depth of the outlet expressed in m</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="scenarioName" type="xs:string">
      <xs:annotation>
        <xs:documentation>Name assigned to scenario</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="scenarioDescription" type="xs:string">
      <xs:annotation>
        <xs:documentation>Description of the scenario</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="stateOfOil">
      <xs:annotation>
        <xs:documentation>Description of the scenario</xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="FRESH"/>
          <xs:enumeration value="WEATHERED"/>
        </xs:restriction>
      </xs:simpleType>
```

```
      </xs:element>
      <xs:element name="discharge" type="csn:OilSpillModelDischargeType">
        <xs:annotation>
          <xs:documentation>Discharge instantaneous and/or continuous</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="oilTickness" type="xs:double">
        <xs:annotation>
          <xs:documentation>Oil thickness expressed in m</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
 </xs:complexContent>
</xs:complexType>
```

element **OilSpillModelCalculationType/calculationDate**

diagram	csn:calculationDate Calculation Date Time expressed in iso:8601
namespace	http://www.emsa.europa.eu/csndc
type	**xs:dateTime**
properties	isRef 0 content simple
annotation	documentation Calculation Date Time expressed in iso:8601

source	`<xs:element name="calculationDate" type="xs:dateTime">`
	`  <xs:annotation>`
	`  <xs:documentation>Calculation Date Time expressed in iso:8601</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

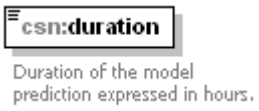
element **OilSpillModelCalculationType/calculationName**

diagram	csn:calculationName Name assigned to calculation
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple
annotation	documentation Name assigned to calculation

source	`<xs:element name="calculationName" type="xs:string">`
	`  <xs:annotation>`
	`  <xs:documentation>Name assigned to calculation </xs:documentation>`
	`  </xs:annotation>`

	</xs:element>

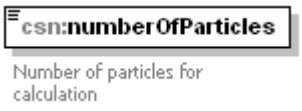
element **OilSpillModelCalculationType/duration**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Duration of the model prediction expressed in hours.
source	<xs:element name="duration" type="xs:double"> <xs:annotation> <xs:documentation>Duration of the model prediction expressed in hours.</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/timeResolution**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Time resolution of model run expressed as hours
source	<xs:element name="timeResolution" type="xs:double"> <xs:annotation> <xs:documentation>Time resolution of model run expressed as hours</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/numberOfParticles**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple

annotation	documentation Number of particles for calculation
source	<xs:element name="numberOfParticles" type="xs:string"> <xs:annotation> <xs:documentation>Number of particles for calculation</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/centreTrajectory**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:boolean**
properties	isRef 0 minOcc 0 maxOcc 1 content simple
annotation	documentation Was trajectory of the centre of mass requested?
source	<xs:element name="centreTrajectory" type="xs:boolean" minOccurs="0"> <xs:annotation> <xs:documentation>Was trajectory of the centre of mass requested?</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/particleTrajectory**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:boolean**
properties	isRef 0 minOcc 0 maxOcc 1 content simple
annotation	documentation Was trajectory of the particles requested?
source	<xs:element name="particleTrajectory" type="xs:boolean" minOccurs="0"> <xs:annotation> <xs:documentation>Was trajectory of the particles requested?</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/outletDepth**

diagram	csn:outletDepth Depth of the outlet expressed in m
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Depth of the outlet expressed in m
source	<xs:element name="outletDepth" type="xs:double"> <xs:annotation> <xs:documentation>Depth of the outlet expressed in m</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/scenarioName**

diagram	csn:scenarioName Name assigned to scenario
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple
annotation	documentation Name assigned to scenario
source	<xs:element name="scenarioName" type="xs:string"> <xs:annotation> <xs:documentation>Name assigned to scenario</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/scenarioDescription**

diagram	csn:scenarioDescription Description of the scenario
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple
annotation	documentation Description of the scenario
source	<xs:element name="scenarioDescription" type="xs:string">\ <xs:annotation> <xs:documentation>Description of the scenario</xs:documentation>

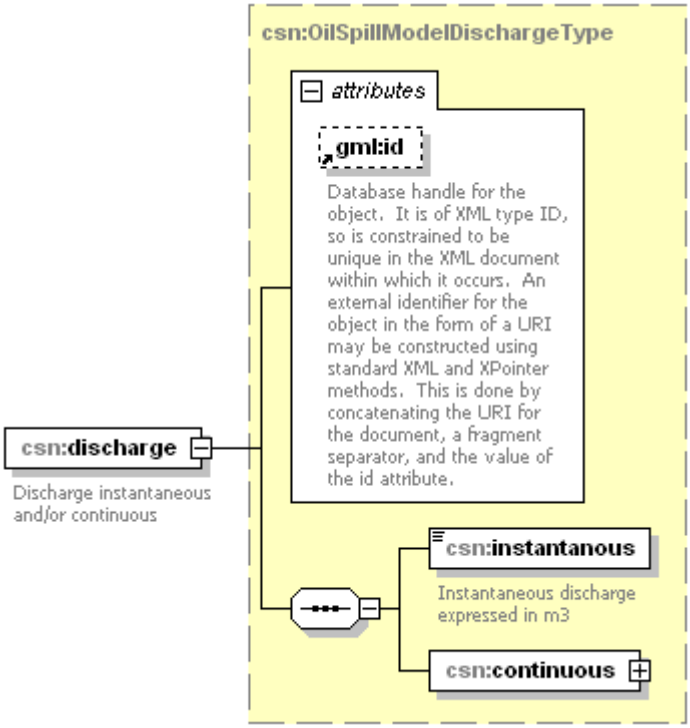
	<xs:annotation> </xs:element>

element **OilSpillModelCalculationType/stateOfOil**

diagram	csn:stateOfOil Description of the scenario
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
properties	isRef 0 content simple
facets	enumeration FRESH enumeration WEATHERED
annotation	documentation Description of the scenario
source	<xs:element name="stateOfOil"> <xs:annotation> <xs:documentation>Description of the scenario</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="FRESH"/> <xs:enumeration value="WEATHERED"/> </xs:restriction> </xs:simpleType> </xs:element>

element **OilSpillModelCalculationType/discharge**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	**csn:OilSpillModelDischargeType**
properties	isRef 0 content complex mixed true
children	**csn:instantanous** **csn:continuous**

attributes

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This

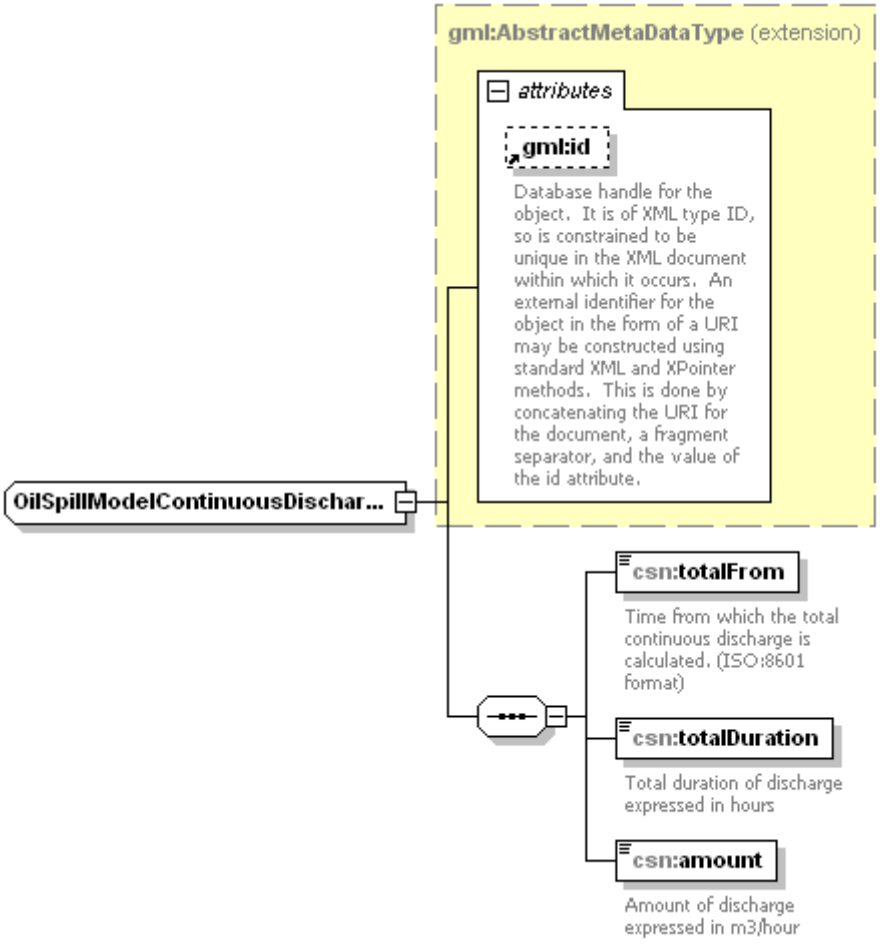
	is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Discharge instantaneous and/or continuous
source	<xs:element name="discharge" type="csn:OilSpillModelDischargeType"> <xs:annotation> <xs:documentation>Discharge instantaneous and/or continuous</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelCalculationType/oilTickness**

diagram	csn:oilTickness Oil thickness expressed in m
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Oil thickness expressed in m
source	<xs:element name="oilTickness" type="xs:double"> <xs:annotation> <xs:documentation>Oil thickness expressed in m</xs:documentation> </xs:annotation> </xs:element>

complexType **OilSpillModelContinuousDischargeType**

diagram



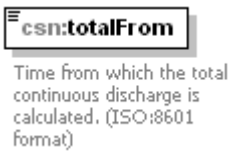
namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractMetaDataType**
properties	base gml:AbstractMetaDataType mixed true
children	**csn:totalFrom** **csn:totalDuration** **csn:amount**
used by	element **OilSpillModelDischargeType/continuous**

attributes

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a

	URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
source	<xs:complexType name="OilSpillModelContinuousDischargeType" mixed="true"> <xs:complexContent mixed="true"><xs:complexContent mixed="true"> <xs:extension base="gml:AbstractMetaDataType"><xs:extension base="gml:AbstractMetaDataType"> <xs:sequence><xs:sequence> <xs:element name="totalFrom" type="xs:dateTime"><xs:element name="totalFrom" type="xs:dateTime"> <xs:annotation><xs:annotation> <xs:documentation>Time from which the total continuous discharge is calculated. (ISO:8601 format)</xs:documentation> </xs:annotation> </xs:element> <xs:element name="totalDuration" type="xs:double"><xs:element name="totalDuration" type="xs:double"> <xs:annotation><xs:annotation> <xs:documentation>Total duration of discharge expressed in hours</xs:documentation> </xs:annotation> </xs:element> <xs:element name="amount" type="xs:double"><xs:element name="amount" type="xs:double"> <xs:annotation><xs:annotation> <xs:documentation>Amount of discharge expressed in m3/hour</xs:documentation> </xs:annotation> </xs:element> </xs:sequence> </xs:extension> </xs:complexContent> </xs:complexType>

element **OilSpillModelContinuousDischargeType/totalFrom**

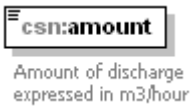
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:dateTime**
properties	isRef 0 content simple
annotation	documentation Time from which the total continuous discharge is calculated. (ISO:8601 format)

source	<xs:element name="totalFrom" type="xs:dateTime"> <xs:annotation> <xs:documentation>Time from which the total continuous discharge is calculated. (ISO:8601 format)</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelContinuousDischargeType/totalDuration**

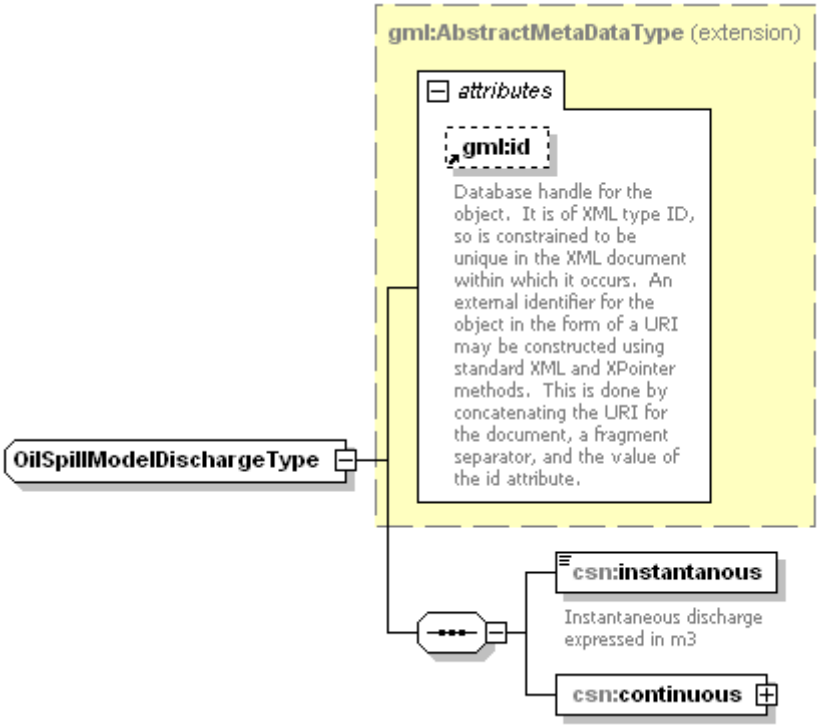
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Total duration of discharge expressed in hours
source	<xs:element name="totalDuration" type="xs:double"> <xs:annotation> <xs:documentation>Total duration of discharge expressed in hours</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelContinuousDischargeType/amount**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Amount of discharge expressed in m3/hour
source	<xs:element name="amount" type="xs:double"> <xs:annotation> <xs:documentation>Amount of discharge expressed in m3/hour</xs:documentation> </xs:annotation> </xs:element>

complexType **OilSpillModelDischargeType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractMetaDataType**
properties	base gml:AbstractMetaDataType mixed true
children	**csn:instantanous** **csn:continuous**
used by	element **OilSpillModelCalculationType/discharge**

attributes

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This

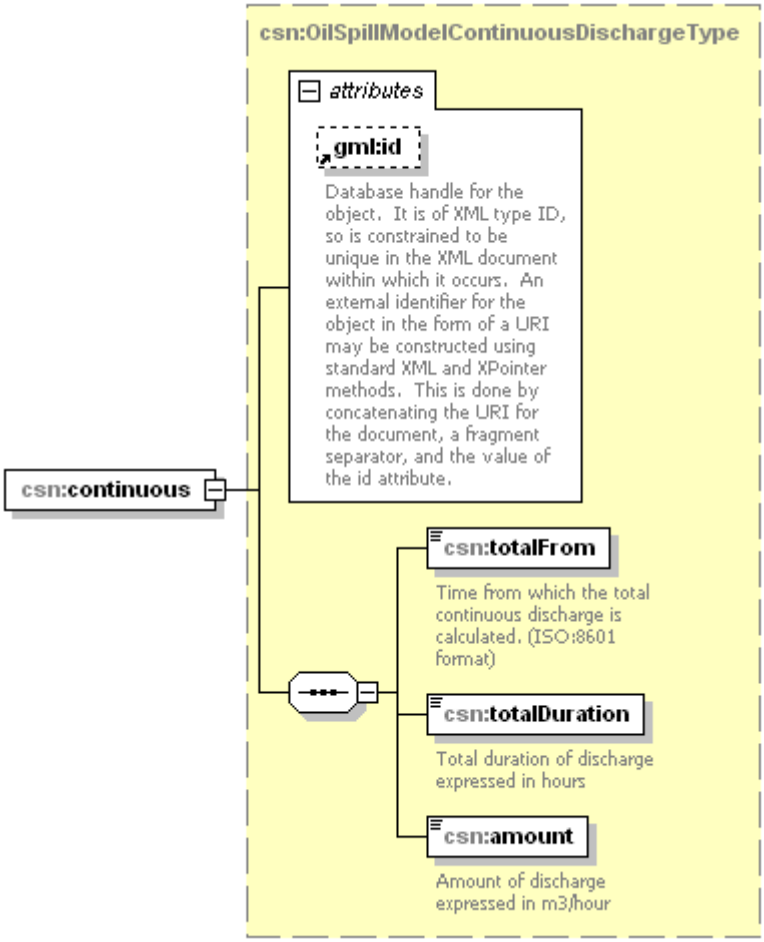
	is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
source	<xs:complexType name="OilSpillModelDischargeType" mixed="true">\<xs:complexContent mixed="true">\<xs:extension base="gml:AbstractMetaDataType">\<xs:sequence>\<xs:element name="instantanous" type="xs:double">\<xs:annotation>\<xs:documentation>Instantaneous discharge expressed in m3</xs:documentation>\</xs:annotation>\</xs:element>\<xs:element name="continuous" type="csn:OilSpillModelContinuousDischargeType"/>\</xs:sequence>\</xs:extension>\</xs:complexContent>\</xs:complexType>

element **OilSpillModelDischargeType/instantanous**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 content simple
annotation	documentation Instantaneous discharge expressed in m3
source	<xs:element name="instantanous" type="xs:double">\<xs:annotation>\<xs:documentation>Instantaneous discharge expressed in m3</xs:documentation>\</xs:annotation>\</xs:element>

element **OilSpillModelDischargeType/continuous**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	**csn:OilSpillModelContinuousDischargeType**
properties	isRef 0 content complex mixed true
children	**csn:totalFrom** **csn:totalDuration** **csn:amount**

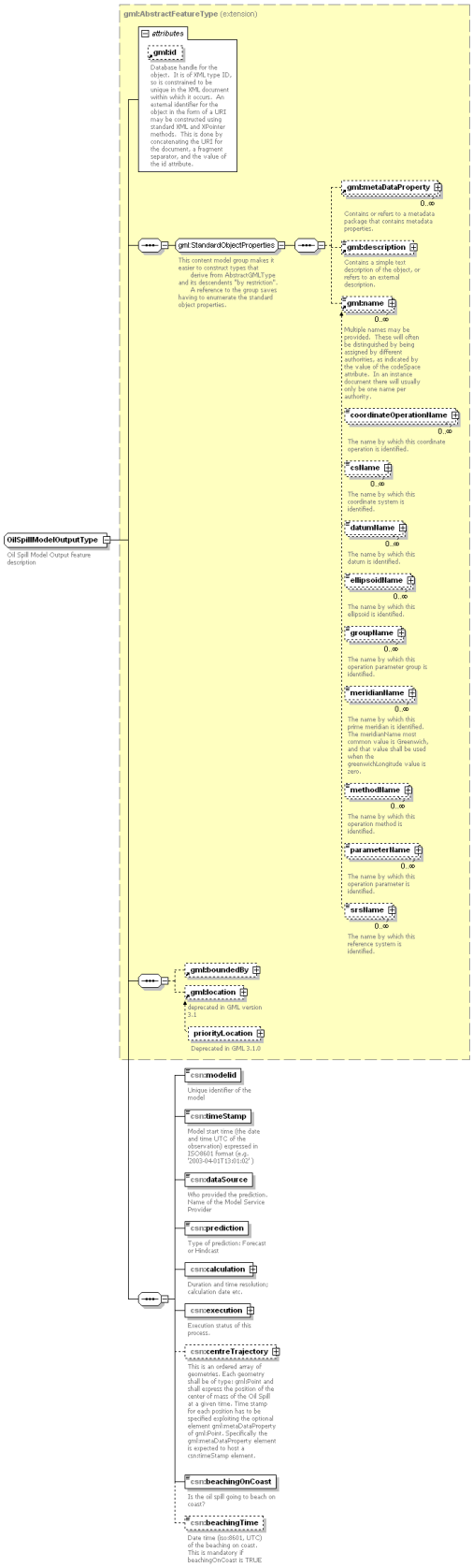
attributes

Name	Type	Use	Default	Fixed	annotation
id		optional			documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a

		URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
source	<xs:element name="continuous" type="csn:OilSpillModelContinuousDischargeType"/>	

complexType **OilSpillModelOutputType**

diagram



namespace	http://www.emsa.europa.eu/csndc
type	extension of **gml:AbstractFeatureType**

properties	base gml:AbstractFeatureType
children	**gml:metaDataProperty gml:description gml:name gml:boundedBy gml:location csn:modelid csn:timeStamp csn:dataSource csn:prediction csn:calculation csn:execution csn:centreTrajectory csn:beachingOnCoast csn:beachingTime**
used by	element **OilSpillModelOutput**
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Oil Spill Model Output feature description

source

```
<xs:complexType name="OilSpillModelOutputType">
  <xs:annotation>
    <xs:documentation>Oil Spill Model Output feature description</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="gml:AbstractFeatureType">
      <xs:sequence>
        <xs:element name="modelid" type="xs:string">
          <xs:annotation>
            <xs:documentation>Unique identifier of the model</xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="timeStamp" type="xs:dateTime">
          <xs:annotation>
```

```
          <xs:documentation>Model start time (the date and time UTC of the observation) expressed in
ISO8601 format (e.g. '2003-04-01T13:01:02' )</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="dataSource" type="xs:string">
        <xs:annotation>
          <xs:documentation>Who provided the prediction. Name of the Model Service
Provider</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="prediction">
        <xs:annotation>
          <xs:documentation>Type of prediction: Forecast or Hindcast</xs:documentation>
        </xs:annotation>
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="FORECAST"/>
            <xs:enumeration value="HINDCAST"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="calculation" type="csn:OilSpillModelCalculationType">
        <xs:annotation>
          <xs:documentation>Duration and time resolution; calculation date etc.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="execution" type="csn:ExecutionStatusType">
        <xs:annotation>
          <xs:documentation>Execution status of this process.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="centreTrajectory" type="gml:GeometryArrayPropertyType" minOccurs="0">
        <xs:annotation>
          <xs:documentation>This is an ordered array of geometries. Each geometry shall be of type:
gml:Point and shall express the position of the center of mass of the Oil Spill at a given time. Time
stamp for each position has to be specified exploiting the optional element gml:metaDataProperty of
gml:Point. Specifically the gml:metaDataProperty element is expected to host a csn:timeStamp
element.
           </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="beachingOnCoast" type="xs:boolean">
        <xs:annotation>
          <xs:documentation>Is the oil spill going to beach on coast?</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="beachingTime" type="xs:boolean" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Date time (iso:8601, UTC) of the beaching on coast. This is mandatory if
beachingOnCoast is TRUE</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
```

	<xs:complexContent> </xs:complexType>

element **OilSpillModelOutputType/modelid**

diagram	csn:modelid Unique identifier of the model
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple
annotation	documentation Unique identifier of the model
source	<xs:element name="modelid" type="xs:string"> <xs:annotation> <xs:documentation>Unique identifier of the model</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelOutputType/timeStamp**

diagram	csn:timeStamp Model start time (the date and time UTC of the observation) expressed in ISO8601 format (e.g. '2003-04-01T13:01:02')
namespace	http://www.emsa.europa.eu/csndc
type	**xs:dateTime**
properties	isRef 0 content simple
annotation	documentation Model start time (the date and time UTC of the observation) expressed in ISO8601 format (e.g. '2003-04-01T13:01:02')
source	<xs:element name="timeStamp" type="xs:dateTime"> <xs:annotation> <xs:documentation>Model start time (the date and time UTC of the observation) expressed in ISO8601 format (e.g. '2003-04-01T13:01:02')</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelOutputType/dataSource**

diagram	csn:dataSource Who provided the prediction. Name of the Model Service Provider

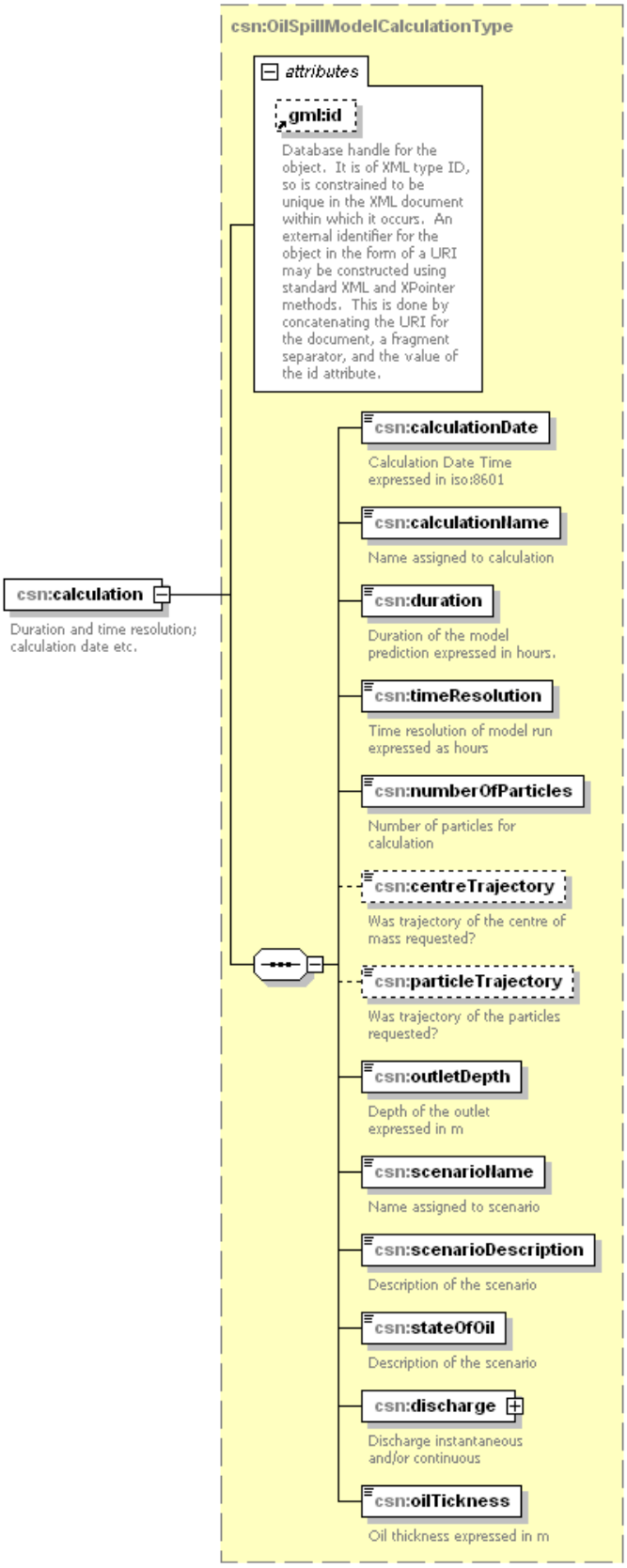
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	isRef 0 content simple
annotation	documentation Who provided the prediction. Name of the Model Service Provider
source	<xs:element name="dataSource" type="xs:string"> <xs:annotation> <xs:documentation>Who provided the prediction. Name of the Model Service Provider</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelOutputType/prediction**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
properties	isRef 0 content simple
facets	enumeration FORECAST enumeration HINDCAST
annotation	documentation Type of prediction: Forecast or Hindcast
source	<xs:element name="prediction"> <xs:annotation> <xs:documentation>Type of prediction: Forecast or Hindcast</xs:documentation> </xs:annotation> <xs:simpleType> <xs:restriction base="xs:string"> <xs:enumeration value="FORECAST"/> <xs:enumeration value="HINDCAST"/> </xs:restriction> </xs:simpleType> </xs:element>

element **OilSpillModelOutputType/calculation**

diagram

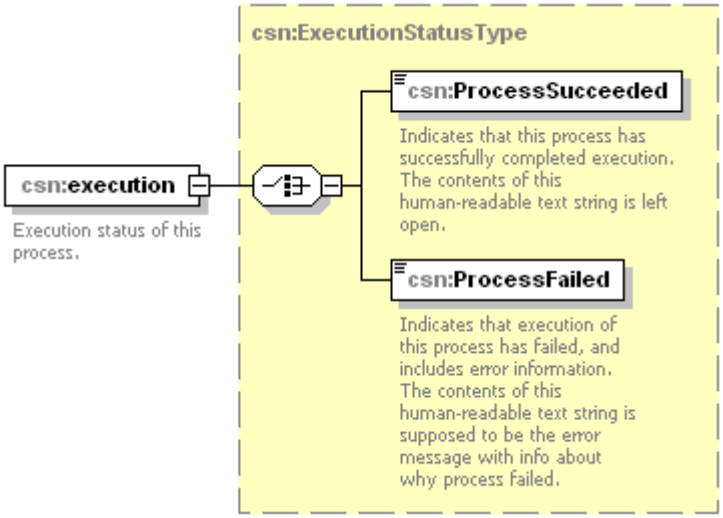


namespace	http://www.emsa.europa.eu/csndc
type	csn:OilSpillModelCalculationType

properties	isRef 0 content complex mixed true
children	csn:calculationDate csn:calculationName csn:duration csn:timeResolution csn:numberOfParticles csn:centreTrajectory csn:particleTrajectory csn:outletDepth csn:scenarioName csn:scenarioDescription csn:stateOfOil csn:discharge csn:oilTickness
attributes	Name: id Type: Use: optional Default: Fixed: annotation: documentation Database handle for the object. It is of XML type ID, so is constrained to be unique in the XML document within which it occurs. An external identifier for the object in the form of a URI may be constructed using standard XML and XPointer methods. This is done by concatenating the URI for the document, a fragment separator, and the value of the id attribute.
annotation	documentation Duration and time resolution; calculation date etc.

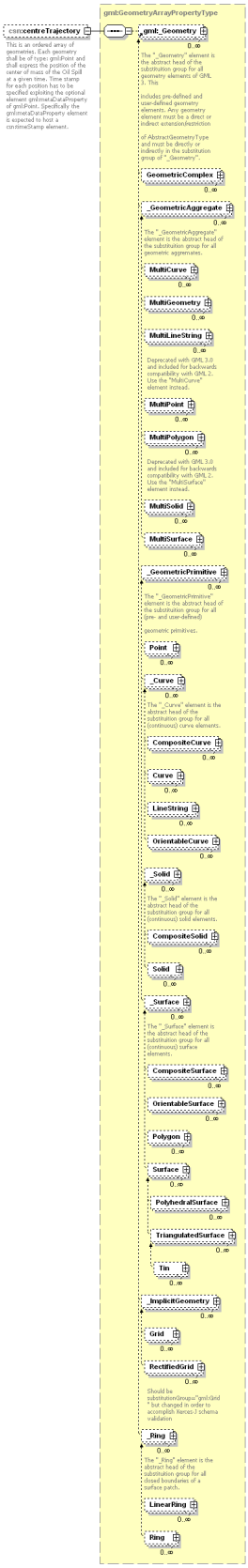
source	`<xs:element name="calculation" type="csn:OilSpillModelCalculationType">`
	`<xs:annotation>`
	`<xs:documentation>Duration and time resolution; calculation date etc.</xs:documentation>`
	`</xs:annotation>`
	`</xs:element>`

element **OilSpillModelOutputType/execution**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:ExecutionStatusType**
properties	isRef 0 content complex
children	**csn:ProcessSucceeded** **csn:ProcessFailed**
annotation	documentation Execution status of this process.

source	`<xs:element name="execution" type="csn:ExecutionStatusType">`
	`  <xs:annotation>`
	`  <xs:documentation>Execution status of this process.</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

element **OilSpillModelOutputType/centreTrajectory**

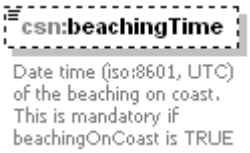
diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**gml:GeometryArrayPropertyType**
properties	isRef 0

	minOcc 0 maxOcc 1 content complex
children	**gml:_Geometry**
annotation	documentation This is an ordered array of geometries. Each geometry shall be of type: gml:Point and shall express the position of the center of mass of the Oil Spill at a given time. Time stamp for each position has to be specified exploiting the optional element gml:metaDataProperty of gml:Point. Specifically the gml:metaDataProperty element is expected to host a csn:timeStamp element.
source	<xs:element name="centreTrajectory" type="gml:GeometryArrayPropertyType" minOccurs="0"> <xs:annotation> <xs:documentation>This is an ordered array of geometries. Each geometry shall be of type: gml:Point and shall express the position of the center of mass of the Oil Spill at a given time. Time stamp for each position has to be specified exploiting the optional element gml:metaDataProperty of gml:Point. Specifically the gml:metaDataProperty element is expected to host a csn:timeStamp element. </xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelOutputType/beachingOnCoast**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:boolean**
properties	isRef 0 content simple
annotation	documentation Is the oil spill going to beach on coast?
source	<xs:element name="beachingOnCoast" type="xs:boolean"> <xs:annotation> <xs:documentation>Is the oil spill going to beach on coast?</xs:documentation> </xs:annotation> </xs:element>

element **OilSpillModelOutputType/beachingTime**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:boolean**

properties	isRef 0 minOcc 0 maxOcc 1 content simple
annotation	documentation Date time (iso:8601, UTC) of the beaching on coast. This is mandatory if beachingOnCoast is TRUE
source	<xs:element name="beachingTime" type="xs:boolean" minOccurs="0"> <xs:annotation> <xs:documentation>Date time (iso:8601, UTC) of the beaching on coast. This is mandatory if beachingOnCoast is TRUE</xs:documentation> </xs:annotation> </xs:element>

21 Annex P – Model Output NetCDF format specification

The NetCDF containing the particle concentration produced by the run of a model shall be compliant with convention CF-1.4 and shall adhere to following format.

Dimensions

Name	Description
lon	maximum length 500; expressed as degrees_east
lat	maximum length 300; expressed as degrees_north
depth	maximum length 35; expressed as meters
time	hours from start date time UTC

Attributes

At least following attributes shall be provided.

Name	Value	Note
Conventions	CF-1.4	
title	Oil Spill Particle Concentration Forecast for <oilspill_id>	The <oilspill_id> placeholder shall be substituted with the identifier of the Oil Spill as provided in the input Oil Spill description GML file
institution	<MSP>	Name of the MSP
model	<model_id>	Identifier of the model that has been executed
creation_date	UTC date of creation of the netCDF (ISO:8601 format yyyy-MM-ddThh:mmZ)	
valid_date	UTC start time of the model run (ISO:8601 format yyyy-MM-ddThh:mmZ)	
westernmost_longitude	western longitude of the maximum box containing the particle concentrations	
easternmost_longitude	eastern longitude of the maximum box containing the particle concentrations	
southernmost_latitude	souther longitude of the maximum box containing the particle concentrations	
northernmost_latitude	norther longitude of the maximum box containing the particle concentrations	

Variables

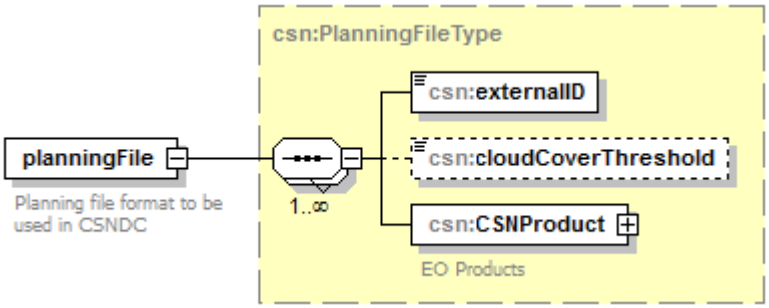
Name	Description	Dimensions
particle_concentration	Particle concentration; (ton/km2)	[time, depth, lat, lon]

22 ANNEX Q –PLANNING FILE GML SCHEMA

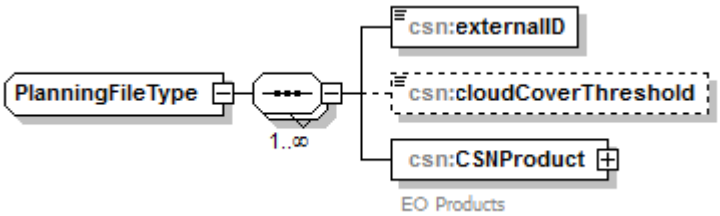
attribute form default: **unqualified**
element form default: **qualified**
targetNamespace: **http://www.emsa.europa.eu/csndc**

Elements	Complex types
planningFile	PlanningFileType

element **planningFile**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	csn:PlanningFileType
properties	content complex
children	csn:externalID csn:cloudCoverThreshold csn:CSNProduct
annotation	documentation Planning file format to be used in CSNDC

complexType **PlanningFileType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
children	csn:externalID csn:cloudCoverThreshold csn:CSNProduct
used by	element planningFile

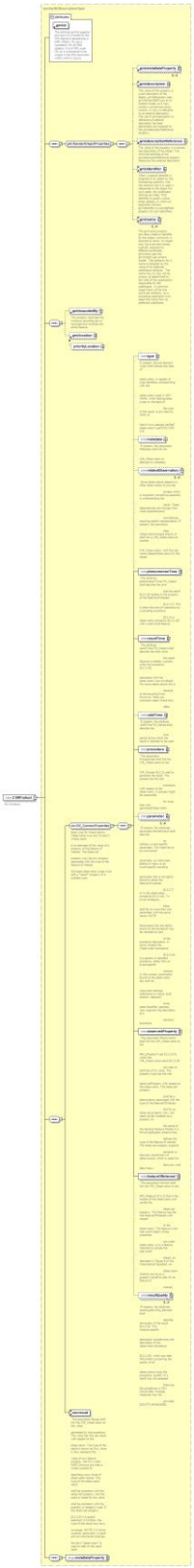
element **PlanningFileType/externalID**

diagram	csn:externalID
namespace	http://www.emsa.europa.eu/csndc
type	**xs:int**
properties	isRef 0 content simple

element **PlanningFileType/cloudCoverThreshold**

diagram	csn:cloudCoverThreshold
namespace	http://www.emsa.europa.eu/csndc
type	**xs:int**
properties	isRef 0 minOcc 0 maxOcc 1 content simple

element **PlanningFileType/CSNProduct**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**sar:EarthObservationType**
properties	isRef 0

	content complex
children	**metaDataProperty description descriptionReference identifier name boundedBy location om:type om:metadata om:relatedObservation om:phenomenonTime om:resultTime om:validTime om:procedure om:parameter om:observedProperty om:featureOfInterest om:resultQuality result eop:metaDataProperty**
annotation	documentation EO Products

See document [PL-SP] planning file mapping for SP, issue 1.3.4 for more detailed information.

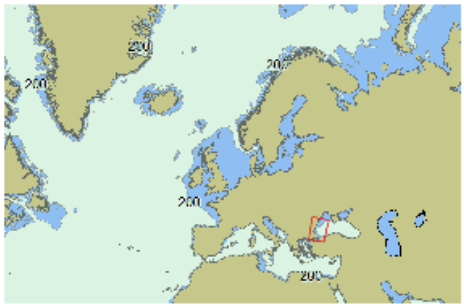
23 ANNEX R- EXAMPLE OF ALERT REPORT

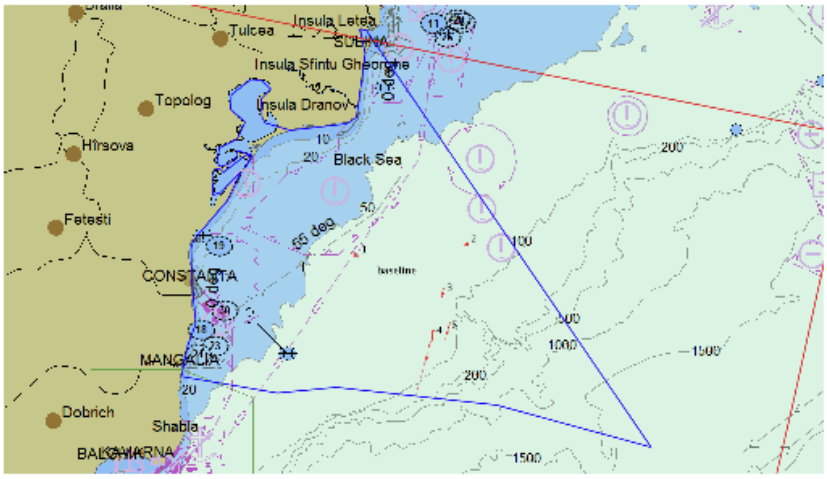
The alert report is a PDF file which is created following a specific template and layout provided by EMSA. An example of such report is provided hereafter.

EMSA

CleanSeaNet Alert Report **ROMANIA** Acquisition: **2012-03-08 08:20:12 UTC**

Scene ID: **19644** **ENVISAT - ASAR - WS** GIS Viewer





Comments

List of possible spills

Spill # on map	Spill Identifier	Centre Position		Area	Length	Width	Alert	Oil Spill Warning Issued	Possible Source	
		Latitude	Longitude	(km²)	(km)	(km)			Detected	Identified
1	OS_19644_1	44° 16' 01" N	029° 36' 22" E	2.55	5.34	0.48	Red	NO	Yes	No
2	OS_19644_2	44° 18' 51" N	030° 15' 24" E	1.68	3.56	0.47	Red	NO	Yes	No
3	OS_19644_3	44° 06' 20" N	030° 06' 54" E	2.64	5.20	0.51	Red	NO	Yes	No
4	OS_19644_4	43° 55' 25" N	030° 03' 14" E	11.71	32.70	0.36	Red	NO	Yes	No
5	OS_19644_5	43° 56' 42" N	030° 08' 38" E	3.71	10.19	0.36	Red	NO	Yes	No

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24 ANNEX S – ACTIVITY DETECTION XML SCHEMA

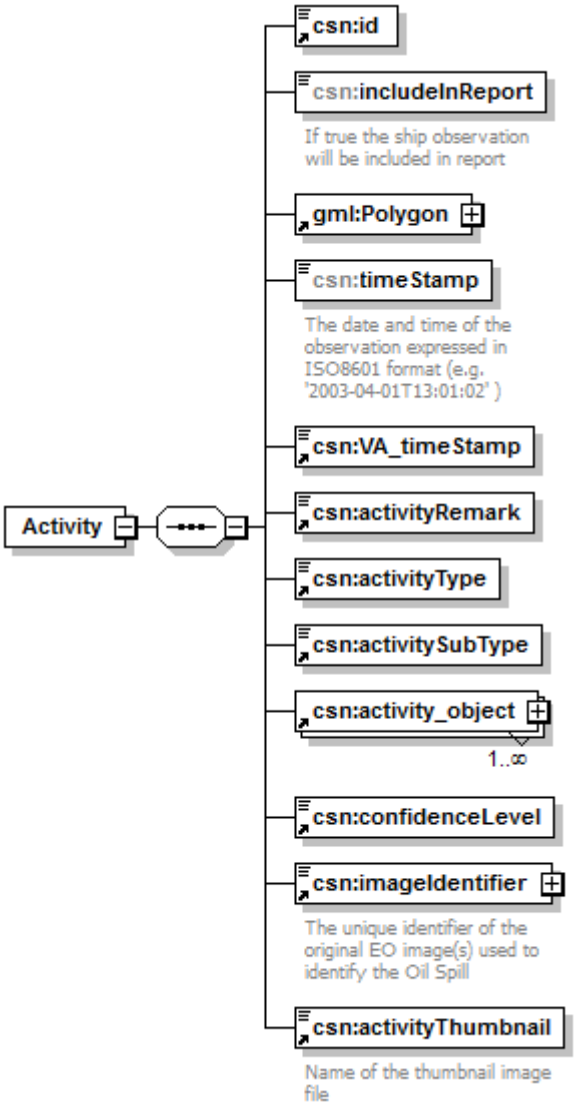
Schema **csndc_activity_DA_20130311.xsd**

schema location:	**C:\Users\euroconsult\Documents\Progetti\CSN-DC\Project Documents\EICD\EICD_1.3.4_beta\EICD_1.3.4_schemas\csndc_schemas\csndc_activity_DA_20130311.xsd**
attribute form default:	**unqualified**
element form default:	**qualified**
targetNamespace:	**http://www.emsa.europa.eu/csndc**

Elements	Complex types	Simple types
Activity	**ImageType**	**SensorType**
activity_object		
activityRemark		
activitySubType		
activityThumbnail		
activityType		
confidenceLevel		
id		
imageIdentifier		
objectConfidenceLevel		
remark		
type		
VA_timeStamp		

element **Activity**

diagram



namespace	http://www.emsa.europa.eu/csndc
properties	content complex
children	csn:id csn:includeInReport **gml:Polygon** csn:timeStamp csn:VA_timeStamp csn:activityRemark csn:activityType csn:activitySubType csn:activity_object csn:confidenceLevel csn:imageIdentifier csn:activityThumbnail

source

```
<xs:element name="Activity">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="csn:id"/>
      <xs:element name="includeInReport" type="xs:boolean" default="false">
        <xs:annotation>
          <xs:documentation>If true the ship observation will be included in report</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element ref="gml:Polygon"/>
      <xs:element name="timeStamp" type="xs:dateTime">
        <xs:annotation>
          <xs:documentation>The date and time of the observation expressed in ISO8601 format (e.g.
'2003-04-01T13:01:02' )</xs:documentation>
```

```
      </xs:annotation>
    </xs:element>
    <xs:element ref="csn:VA_timeStamp"/>
    <xs:element ref="csn:activityRemark"/>
    <xs:element ref="csn:activityType"/>
    <xs:element ref="csn:activitySubType"/>
    <xs:element ref="csn:activity_object" maxOccurs="unbounded"/>
    <xs:element ref="csn:confidenceLevel"/>
    <xs:element ref="csn:imageIdentifier"/>
    <xs:element ref="csn:activityThumbnail"/>
  </xs:sequence>
 </xs:complexType>
</xs:element>
```

element **Activity/includeInReport**

diagram	csn:includeInReport If true the ship observation will be included in report
namespace	http://www.emsa.europa.eu/csndc
type	**xs:boolean**
properties	isRef 0 content simple default false
annotation	documentation If true the ship observation will be included in report

source	`<xs:element name="includeInReport" type="xs:boolean" default="false">`
	`  <xs:annotation>`
	`  <xs:documentation>If true the ship observation will be included in report</xs:documentation>`
	`  </xs:annotation>`
	`</xs:element>`

element **Activity/timeStamp**

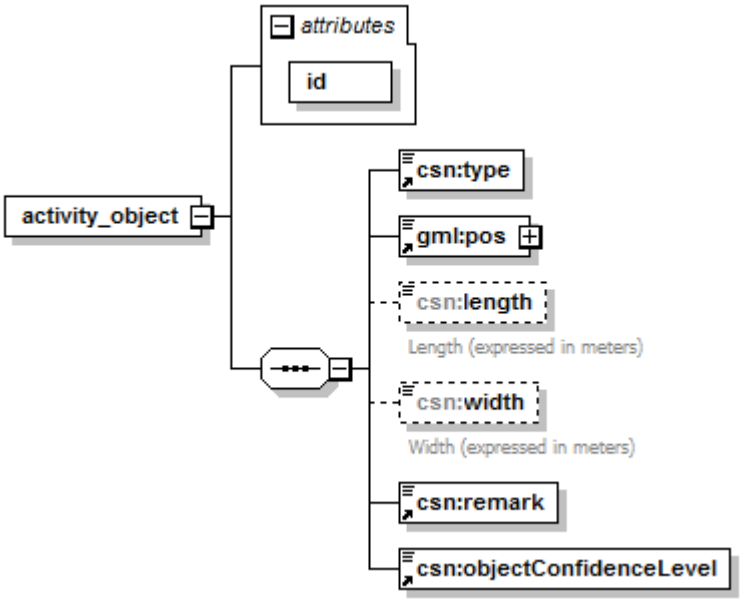
diagram	csn:timeStamp The date and time of the observation expressed in ISO8601 format (e.g. '2003-04-01T13:01:02')
namespace	http://www.emsa.europa.eu/csndc
type	**xs:dateTime**
properties	isRef 0 content simple
annotation	documentation The date and time of the observation expressed in ISO8601 format (e.g. '2003-04-01T13:01:02')

source	`<xs:element name="timeStamp" type="xs:dateTime">`
	`  <xs:annotation>`
	`  <xs:documentation>The date and time of the observation expressed in ISO8601 format (e.g. '2003-04-01T13:01:02' )</xs:documentation>`

```
  </xs:annotation>
</xs:element>
```

element **activity_object**

diagram



namespace	http://www.emsa.europa.eu/csndc
properties	content complex
children	**csn:type gml:pos csn:length csn:width csn:remark csn:objectConfidenceLevel**

attributes

Name	Type	Use	Default	Fixed	annotation
id	**xs:byte**	required			

source

```
<xs:element name="activity_object">
  <xs:complexType>
    <xs:sequence>
      <xs:element ref="csn:type"/>
      <xs:element ref="gml:pos"/>
      <xs:element name="length" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Length (expressed in meters)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="width" type="xs:double" minOccurs="0">
        <xs:annotation>
          <xs:documentation>Width (expressed in meters)</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element ref="csn:remark"/>
      <xs:element ref="csn:objectConfidenceLevel"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:byte" use="required"/>
  </xs:complexType>
</xs:element>
```

attribute **activity_object/@id**

type	**xs:byte**
properties	isRef 0 use required
source	<xs:attribute name="id" type="xs:byte" use="required"/>

element **activity_object/length**

diagram	csn:length Length (expressed in meters)
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 minOcc 0 maxOcc 1 content simple
annotation	documentation Length (expressed in meters)
source	<xs:element name="length" type="xs:double" minOccurs="0"> <xs:annotation> <xs:documentation>Length (expressed in meters)</xs:documentation> </xs:annotation> </xs:element>

element **activity_object/width**

diagram	csn:width Width (expressed in meters)
namespace	http://www.emsa.europa.eu/csndc
type	**xs:double**
properties	isRef 0 minOcc 0 maxOcc 1 content simple
annotation	documentation Width (expressed in meters)
source	<xs:element name="width" type="xs:double" minOccurs="0"> <xs:annotation> <xs:documentation>Width (expressed in meters)</xs:documentation> </xs:annotation> </xs:element>

element **activityRemark**

diagram	activityRemark
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="activityRemark" type="xs:string"/>

element **activitySubType**

diagram	activitySubType
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="activitySubType" type="xs:string"/>

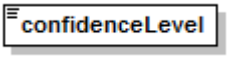
element **activityThumbnail**

diagram	activityThumbnail Name of the thumbnail image file
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
annotation	documentation Name of the thumbnail image file
source	<xs:element name="activityThumbnail" type="xs:string"> <xs:annotation> <xs:documentation>Name of the thumbnail image file</xs:documentation> </xs:annotation> </xs:element>

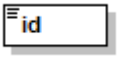
element **activityType**

diagram	activityType
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="activityType" type="xs:string"/>

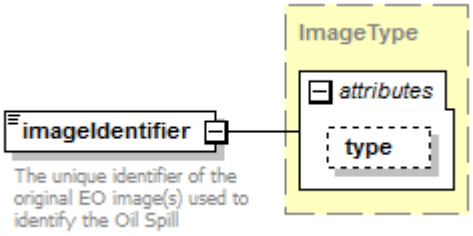
element **confidenceLevel**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="confidenceLevel" type="xs:string"/>

element **id**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="id" type="xs:string"/>

element **imageIdentifier**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	**csn:ImageType**
properties	content complex
attributes	Name Type Use Default Fixed annotation type **csn:SensorType**
annotation	documentation The unique identifier of the original EO image(s) used to identify the Oil Spill
source	<xs:element name="imageIdentifier" type="csn:ImageType"> <xs:annotation> <xs:documentation>The unique identifier of the original EO image(s) used to identify the Oil Spill</xs:documentation> </xs:annotation> </xs:element>

element **objectConfidenceLevel**

diagram	objectConfidenceLevel
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="objectConfidenceLevel" type="xs:string"/>

element **remark**

diagram	remark
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="remark" type="xs:string"/>

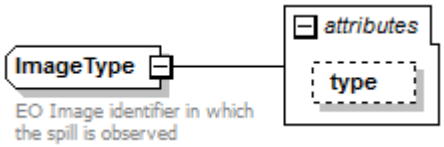
element **type**

diagram	type
namespace	http://www.emsa.europa.eu/csndc
type	**xs:string**
properties	content simple
source	<xs:element name="type" type="xs:string"/>

element **VA_timeStamp**

diagram	VA_timeStamp
namespace	http://www.emsa.europa.eu/csndc
type	**xs:dateTime**
properties	content simple
source	<xs:element name="VA_timeStamp" type="xs:dateTime"/>

complexType **ImageType**

diagram	
namespace	http://www.emsa.europa.eu/csndc
type	extension of **xs:string**
properties	base xs:string
attributes	Name Type Use Default Fixed annotation type **csn:SensorType**
annotation	documentation EO Image identifier in which the spill is observed

source	`<xs:complexType name="ImageType">`
	`<xs:annotation>`
	`<xs:documentation>EO Image identifier in which the spill is observed</xs:documentation>`
	`</xs:annotation>`
	`<xs:simpleContent>`
	`<xs:extension base="xs:string">`
	`<xs:attribute name="type" type="csn:SensorType"/>`
	`</xs:extension>`
	`</xs:simpleContent>`
	`</xs:complexType>`

attribute **ImageType/@type**

type	**csn:SensorType**
properties	isRef 0
facets	Kind Value annotation enumeration SAR enumeration VIS-IR enumeration OTHER
source	`<xs:attribute name="type" type="csn:SensorType"/>`

simpleType **SensorType**

namespace	http://www.emsa.europa.eu/csndc
type	restriction of **xs:string**
facets	Kind Value annotation enumeration SAR enumeration VIS-IR enumeration OTHER
annotation	documentation EO Sensor Type

source	`<xs:simpleType name="SensorType">`
	`<xs:annotation>`
	`<xs:documentation>EO Sensor Type</xs:documentation>`

	<xs:annotation> <xs:restriction base="xs:string"> <xs:enumeration value="SAR"/> <xs:enumeration value="VIS-IR"/> <xs:enumeration value="OTHER"/> </xs:restriction> </xs:simpleType>

XML Schema documentation generated by **XMLSpy** Schema Editor **http://www.altova.com/xmlspy**

25 Annex T – Geospatial services requests details and examples

25.1 Web Feature Service (WFS)

WFS is used to request Oil Spill and Vessel Traffic data and detected vessels data from CSNDC.

The current end point for the service is: https://csndc.emsa.europa.eu:444/deegree-wfs/services

25.1.1 GetCapabilities

25.1.1.1 Example of request

```
<GetCapabilities service="WFS" version="1.0.0" xmlns="http://www.opengis.net/wfs" />
```

25.1.1.2 Example of response

```
<WFS_Capabilities updateSequence="0" version="1.0.0">
	<Service>
		<Name>EMSA_CSNDC_WFS</Name>
		<Title>EMSA_CSNDC_WFS</Title>
		<Keywords>WFS deegree CSNDC EMSA 1.1.0</Keywords>
		<OnlineResource>http://www.emsa.europa.eu</OnlineResource>
		<Fees>None</Fees>
		<AccessConstraints>NONE</AccessConstraints>
	</Service>
	<Capability>
		<Request>
			<GetFeature>
				<ResultFormat>
					<GML2/>
				</ResultFormat>
				<DCPType>
					<HTTP>
						<Get
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services?"/>
						<Post
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services"/>
```

```
                                        </HTTP>
                                </DCPType>
                        </GetFeature>
                        <DescribeFeatureType>
                                <SchemaDescriptionLanguage>
                                        <XMLSCHEMA/>
                                </SchemaDescriptionLanguage>
                                <DCPType>
                                        <HTTP>
                                                <Get
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services?"/>
                                                <Post
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services"/>
                                        </HTTP>
                                </DCPType>
                        </DescribeFeatureType>
                        <GetCapabilities>
                                <DCPType>
                                        <HTTP>
                                                <Get
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services?"/>
                                                <Post
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services"/>
                                        </HTTP>
                                </DCPType>
                        </GetCapabilities>
                        <GetFeatureWithLock>
                                <ResultFormat>
                                        <GML2/>
                                </ResultFormat>
                                <DCPType>
                                        <HTTP>
                                                <Get
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services?"/>
                                                <Post
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services"/>
                                        </HTTP>
                                </DCPType>
                        </GetFeatureWithLock>
                        <LockFeature>
                                <DCPType>
                                        <HTTP>
                                                <Get
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services?"/>
                                                <Post
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services"/>
                                        </HTTP>
                                </DCPType>
                        </LockFeature>
                        <Transaction>
                                <DCPType>
                                        <HTTP>
                                                <Get
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services?"/>
```

```
                                                <Post
onlineResource="https://csndc.emsa.europa.eu:444/deegree-wfs/services"/>
                                        </HTTP>
                                </DCPType>
                        </Transaction>
                </Request>
        </Capability>
        <FeatureTypeList>
                <FeatureType>
                        <Name>csn:Keywords</Name>
                        <Title>Keywords</Title>
                        <SRS>EPSG:4326</SRS>
                        <Operations>
                                <Query/>
                        </Operations>
                        <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
                </FeatureType>
                <FeatureType>
                        <Name>csn:Extension</Name>
                        <Title>Extension</Title>
                        <SRS>EPSG:4326</SRS>
                        <Operations>
                                <Query/>
                        </Operations>
                        <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
                </FeatureType>
                <FeatureType>
                        <Name>csn:ShipImageIdentifier</Name>
                        <Title>ShipImageIdentifier</Title>
                        <SRS>EPSG:4326</SRS>
                        <Operations>
                                <Query/>
                        </Operations>
                        <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
                </FeatureType>
                <FeatureType>
                        <Name>csn:AuxiliaryDataReference</Name>
                        <Title>AuxiliaryDataReference</Title>
                        <SRS>EPSG:4326</SRS>
                        <Operations>
                                <Query/>
                        </Operations>
                        <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
                </FeatureType>
                <FeatureType>
                        <Name>csn:LocationClassification</Name>
                        <Title>LocationClassification</Title>
                        <SRS>EPSG:4326</SRS>
                        <Operations>
                                <Query/>
                        </Operations>
                        <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
                </FeatureType>
                <FeatureType>
```

```
            <Name>csn:Annotation</Name>
            <Title>Annotation</Title>
            <SRS>EPSG:4326</SRS>
            <Operations>
                <Query/>
            </Operations>
            <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
            <Name>csn:InSituInformation</Name>
            <Title>InSituInformation</Title>
            <SRS>EPSG:4326</SRS>
            <Operations>
                <Query/>
            </Operations>
            <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
            <Name>csn:ImageIdentifier</Name>
            <Title>ImageIdentifier</Title>
            <SRS>EPSG:4326</SRS>
            <Operations>
                <Query/>
            </Operations>
            <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
            <Name>csn:OilSpill</Name>
            <Title>OilSpill</Title>
            <SRS>EPSG:4326</SRS>
            <Operations>
                <Query/>
            </Operations>
            <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
            <Name>ais:objectStatus</Name>
            <Title>AIS Vessel positions in CSN-DC</Title>
            <Abstract>AIS Vessel  positions in CSN-DC</Abstract>
            <Keywords>AIS</Keywords>
            <SRS>EPSG:4326</SRS>
            <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
            <Name>csn:RelatedEvents</Name>
            <Title>RelatedEvents</Title>
            <SRS>EPSG:4326</SRS>
            <Operations>
                <Query/>
            </Operations>
            <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
            <Name>csn:Ship</Name>
```

```
                <Title>Ship</Title>
                <SRS>EPSG:4326</SRS>
                <Operations>
                        <Query/>
                </Operations>
                <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
                <Name>ais:feature</Name>
                <Title>AIS Vessel in CSN-DC</Title>
                <Abstract>AIS Vessel in CSN-DC</Abstract>
                <Keywords>AIS</Keywords>
                <SRS>EPSG:4326</SRS>
                <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
                <Name>csn:PossibleSources</Name>
                <Title>PossibleSources</Title>
                <SRS>EPSG:4326</SRS>
                <Operations>
                        <Query/>
                </Operations>
                <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
        <FeatureType>
                <Name>csn:SpecificInformation</Name>
                <Title>SpecificInformation</Title>
                <SRS>EPSG:4326</SRS>
                <Operations>
                        <Query/>
                </Operations>
                <LatLongBoundingBox maxx="180.0" maxy="90.0" minx="-180.0" miny="-90.0"/>
        </FeatureType>
</FeatureTypeList>
<ogc:Filter_Capabilities>
        <ogc:Spatial_Capabilities>
                <ogc:Spatial_Operators>
                        <ogc:BBOX/>
                        <ogc:Equals/>
                        <ogc:Disjoint/>
                        <ogc:Touches/>
                        <ogc:Crosses/>
                        <ogc:Within/>
                        <ogc:Contains/>
                        <ogc:Overlaps/>
                        <ogc:Beyond/>
                </ogc:Spatial_Operators>
        </ogc:Spatial_Capabilities>
        <ogc:Scalar_Capabilities>
                <ogc:Logical_Operators/>
                <ogc:Comparison_Operators>
                        <ogc:Simple_Comparisons/>
                        <ogc:Like/>
                        <ogc:Between/>
```

```
                                <ogc:NullCheck/>
                            </ogc:Comparison_Operators>
                        </ogc:Scalar_Capabilities>
                    </ogc:Filter_Capabilities>
</WFS_Capabilities>
```

25.1.2 DescribeFeature

25.1.2.1 Example of request

```
<wfs:DescribeFeatureType version="1.1.0" xmlns:csn="http://www.emsa.europa.eu/csndc"
xmlns:wfs="http://www.opengis.net/wfs" xmlns:gml="http://www.opengis.net/gml"
xmlns:ogc="http://www.opengis.net/ogc" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd">
        <!-- describes the featuretype csn:OillSpill  -->
        <wfs:TypeName>ais:feature</wfs:TypeName>
</wfs:DescribeFeatureType>
```

25.1.2.2 Example of response

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:ais="http://www.emsa.europa.eu/ais"
xmlns:gml="http://www.opengis.net/gml" xmlns:topp="http://www.openplans.org/topp"
elementFormDefault="qualified" targetNamespace="http://www.emsa.europa.eu/ais">
        <!-- ================================================================== -->
        <!-- GML IMPORT -->
        <xsd:import namespace="http://www.opengis.net/gml"
schemaLocation="http://schemas.opengis.net/gml/3.1.1/base/feature.xsd"/>
        <xsd:import namespace="http://www.opengis.net/gml"
schemaLocation="http://schemas.opengis.net/gml/3.1.1/base//geometryAggregates.xsd"/>
        <!-- ================================================================= -->
        <!-- globally defined ais: elements (direct from gml or xsd namespace types) -->
        <xsd:element name="time" type="xsd:dateTime">
                <xsd:annotation>
                        <xsd:documentation>Allways in UTC timeframe (YYYY-MM-
DDThh:mm:ss)</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="MMSI" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>Vessel Identification according to the IMO AIS
standards</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="expectedTimeOfArrival" type="xsd:dateTime">
                <xsd:annotation>
                        <xsd:documentation>Allways in UTC timeframe (YYYY-MM-
DDThh:mm:ss)</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
```

```
        <xsd:element name="length" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In meters</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="beam" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In meters</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="draught" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In meters</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="courseOverGround" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In decimal deegrees of angle</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="heading" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In decimal deegrees of angle</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="bearing" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In decimal deegrees of angle</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="speedOverGround" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>In knots</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="rateOfTurn" type="xsd:decimal">
                <xsd:annotation>
                        <xsd:documentation>Units as defined for IMO AIS ?</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="navigationalStatus" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>Free text</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="dataSource" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>Organizational source of data for the object of which this element is a
member, used at several levels and may represent a data service provider, a data management sys., an AIS
transmission sys., etc.</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <!-- ================================================================== -->
        <!-- ais: moving object status element - based on a gml Point -->
```

```
        <xsd:element name="objectStatus" substitutionGroup="gml:pointProperty" type="ais:ObjectStatusType">
                <xsd:annotation>
                        <xsd:documentation>Inherits the pointMemberType of gml.  This 'time slice' type
encapsulates the various dynamic properties of AIS objects at a given point in time and
space</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:complexType name="ObjectStatusType">
                <xsd:complexContent>
                        <xsd:extension base="gml:PointPropertyType">
                                <xsd:sequence>
                                        <xsd:element ref="ais:time">
                                                <xsd:annotation>
                                                        <xsd:documentation>Time represents here the AIS
message time stamp (mandatory)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" ref="ais:speedOverGround">
                                                <xsd:annotation>
                                                        <xsd:documentation>SOG as defined for AIS messages
(optional)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" ref="ais:courseOverGround">
                                                <xsd:annotation>
                                                        <xsd:documentation>COG as defined for AIS messages
(optional)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" ref="ais:heading">
                                                <xsd:annotation>
                                                        <xsd:documentation>Heading as defined for AIS
messages (optional)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" ref="ais:bearing">
                                                <xsd:annotation>
                                                        <xsd:documentation>Bearing, not currently defined for
AIS messages (optional)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" ref="ais:rateOfTurn">
                                                <xsd:annotation>
                                                        <xsd:documentation>Rate Of Turn as defined for AIS
messages (optional)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" ref="ais:navigationalStatus">
                                                <xsd:annotation>
                                                        <xsd:documentation>Status free text as defined for AIS
messages (optional)</xsd:documentation>
                                                </xsd:annotation>
                                        </xsd:element>
                                        <xsd:element minOccurs="0" name="safetyMessage" type="xsd:string">
```

```
                                        <xsd:annotation>
                                                <xsd:documentation>optional</xsd:documentation>
                                        </xsd:annotation>
                                </xsd:element>
                                <xsd:element minOccurs="0" ref="ais:dataSource">
                                        <xsd:annotation>
                                                <xsd:documentation>dataSource (optional) represents
here the infrastructure supplying the AIS message</xsd:documentation>
                                        </xsd:annotation>
                                </xsd:element>
                        </xsd:sequence>
                </xsd:extension>
            </xsd:complexContent>
        </xsd:complexType>
        <!-- ================================================================== -->
        <!-- the AIS Track type - parallel to gml: multi point -->
        <xsd:element name="track" substitutionGroup="gml:_GeometricAggregate" type="ais:TrackType">
            <xsd:annotation>
                <xsd:documentation>The track of an object is a sequence of specialized timeslices (i.e.
ObjectStatus) that indicate the dynamic status of the object.  Inherits srsName attribute of abstract geometry type
for defining SRS for this entire track, i.e. all geometry elements within this track are interpreted under the given
SRS, unless differently specified at a lower level for each geometric element.</xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:complexType name="TrackType">
            <xsd:complexContent>
                <xsd:extension base="gml:AbstractGeometricAggregateType">
                    <xsd:sequence>
                        <xsd:element maxOccurs="unbounded" minOccurs="0"
ref="ais:objectStatus"/>
                    </xsd:sequence>
                </xsd:extension>
            </xsd:complexContent>
        </xsd:complexType>
        <!-- ================================================================== -->
        <!-- the AIS Track Property type - every feature should have a geometry property -->
        <xsd:element name="trackProperty" type="ais:TrackPropertyType">
            <xsd:annotation>
                <xsd:documentation>This is applied as the geometry property of a feature, so that general
GML tools can interpret that each feature is associated with a given geometry - NB! it contains no attribute group
refering to gml:AssociationAttributeGroup</xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:complexType name="TrackPropertyType">
            <xsd:sequence minOccurs="0">
                <xsd:element ref="ais:track"/>
            </xsd:sequence>
        </xsd:complexType>
        <xsd:complexType name="FeatureType">
            <xsd:complexContent>
                <xsd:extension base="gml:AbstractFeatureType">
                    <xsd:sequence>
                        <!-- mandatory static AIS properties -->
                        <xsd:element ref="ais:MMSI">
```

```
                <xsd:annotation>
                        <xsd:documentation>mandatory</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="callsign" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>mandatory</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element name="name" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>mandatory</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <!-- optional static AIS properties -->
        <xsd:element minOccurs="0" name="IMONumber" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element minOccurs="0" ref="ais:length">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element minOccurs="0" ref="ais:beam">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element minOccurs="0" name="vesselType" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element minOccurs="0" name="antennaLocation" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <!-- optional voyage related AIS properties-->
        <xsd:element minOccurs="0" ref="ais:draught">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element minOccurs="0" name="hazardousCargo" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
                </xsd:annotation>
        </xsd:element>
        <xsd:element minOccurs="0" name="destination" type="xsd:string">
                <xsd:annotation>
                        <xsd:documentation>optional</xsd:documentation>
```

```
                                        </xsd:annotation>
                                    </xsd:element>
                                    <xsd:element minOccurs="0" ref="ais:expectedTimeOfArrival">
                                        <xsd:annotation>
                                            <xsd:documentation>optional</xsd:documentation>
                                        </xsd:annotation>
                                    </xsd:element>
                                    <xsd:element minOccurs="0" name="extraInfo" type="xsd:string">
                                        <xsd:annotation>
                                            <xsd:documentation>optional</xsd:documentation>
                                        </xsd:annotation>
                                    </xsd:element>
                                    <!-- optional dynamic AIS properties - i.e. the track info -->
                                    <xsd:element minOccurs="0" ref="ais:trackProperty">
                                        <xsd:annotation>
                                            <xsd:documentation>optional</xsd:documentation>
                                        </xsd:annotation>
                                    </xsd:element>
                                    <!-- optional origin of feature properties -->
                                    <xsd:element minOccurs="0" ref="ais:time">
                                        <xsd:annotation>
                                            <xsd:documentation>Time (optional) represents here the
time of creation of this feature as a "snapshot" of history, which implies the latest possible time of an
AISObjectStatus within the feature.     Should be identical to - and omitted here - given the enclosing feature
collection's time</xsd:documentation>
                                        </xsd:annotation>
                                    </xsd:element>
                                    <xsd:element minOccurs="0" ref="ais:dataSource">
                                        <xsd:annotation>
                                            <xsd:documentation>dataSource (optional)  represents
here the generating organizational source for this feature, e.g. coastal traffic authorities collecting AIS messages
from a fleet. Should be identical to - and omitted here - given the enclosing feature collection's
dataSource</xsd:documentation>
                                        </xsd:annotation>
                                    </xsd:element>
                                </xsd:sequence>
                            </xsd:extension>
                        </xsd:complexContent>
                    </xsd:complexType>
                    <xsd:element name="feature" substitutionGroup="gml:_Feature" type="ais:FeatureType"/>
</xsd:schema>
```

25.1.3 GetFeature

25.1.3.1 Examples of request

Here follows an example or a request that is getting **AIS data using a geographic bounding box and a time range**.

```
<wfs:GetFeature service="WFS" version="1.1.0" xmlns:wfs="http://www.opengis.net/wfs"
xmlns:ogc="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd
">
	<wfs:Query typeName="ais:feature">
		<wfs:PropertyName>ais:feature</wfs:PropertyName>
		<ogc:Filter>
			<ogc:And>
				<ogc:BBOX>
					<ogc:PropertyName>point</ogc:PropertyName>
					<gml:Envelope
srsName="http://www.opengis.net/gml/srs/epsg.xml#4326">
						<gml:lowerCorner>34.1669566773135
22.9559057282049</gml:lowerCorner>
						<gml:upperCorner>49.0494585186001
69.0107920007525</gml:upperCorner>
					</gml:Envelope>
				</ogc:BBOX>
				<ogc:PropertyIsBetween>
					<ogc:PropertyName>time</ogc:PropertyName>
					<ogc:LowerBoundary>
						<ogc:Literal>2013-03-18T00:00:00</ogc:Literal>
					</ogc:LowerBoundary>
					<ogc:UpperBoundary>
						<ogc:Literal>2013-03-18T06:00:00</ogc:Literal>
					</ogc:UpperBoundary>
				</ogc:PropertyIsBetween>
			</ogc:And>
		</ogc:Filter>
	</wfs:Query>
</wfs:GetFeature>
```

Here follows an example or a request that is **getting AIS data using directly trhe service ID**.

```
<wfs:GetFeature service="WFS" version="1.1.0" xmlns:ais="http://www.emsa.europa.eu/ais"
xmlns:wfs="http://www.opengis.net/wfs" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.opengis.net/wfs http://schemas.opengis.net/wfs/1.1.0/wfs.xsd">
  <wfs:Query typeName="ais:feature">
    <wfs:PropertyName>ais:feature</wfs:PropertyName>
    <ogc:Filter>
      <ogc:PropertyIsEqualTo>
        <ogc:PropertyName>orderDetailId</ogc:PropertyName>
        <ogc:Literal>124912</ogc:Literal>
      </ogc:PropertyIsEqualTo>
    </ogc:Filter>
  </wfs:Query>
</wfs:GetFeature>
```

Here follows an example or a request that is **getting Oil Spill data using bounding box and time range**.

```
<wfs:GetFeature version="1.1.0" resultType="results" xmlns:csn="http://www.emsa.europa.eu/csndc"
xmlns:wfs="http://www.opengis.net/wfs" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:gml="http://www.opengis.net/gml"
xsi:schemaLocation="http://www.opengis.net/wfs http://schemas.opengis.net/wfs/1.1.0/wfs.xsd">
        <wfs:Query typeName="csn:OilSpill">
                <ogc:Filter xmlns="http://www.opengis.net/ogc">
                        <ogc:And>
                                <ogc:BBOX>

        <ogc:PropertyName>/csn:OilSpill/csn:extension/csn:Extension/csn:geometry</ogc:PropertyName>
                                        <gml:Envelope
srsName="http://www.opengis.net/gml/srs/epsg.xml#4326">
                                                <gml:lowerCorner>0 30.5</gml:lowerCorner>
                                                <gml:upperCorner>40 60.7</gml:upperCorner>
                                        </gml:Envelope>
                                </ogc:BBOX>
                                <ogc:PropertyIsBetween>
                                        <ogc:PropertyName>/csn:OilSpill/csn:timeStamp</ogc:PropertyName>
                                        <ogc:LowerBoundary>
                                                <ogc:Literal>2010-02-01T00:00:00</ogc:Literal>
                                        </ogc:LowerBoundary>
                                        <ogc:UpperBoundary>
                                                <ogc:Literal>2014-03-01T00:00:00</ogc:Literal>
                                        </ogc:UpperBoundary>
                                </ogc:PropertyIsBetween>
                        </ogc:And>
                </ogc:Filter>
        </wfs:Query>
</wfs:GetFeature>
```

Here follows an example or a request that is **getting Detected Vessels data using bounding box and time range**.

```
<wfs:GetFeature service="WFS" version="1.1.0" xmlns:wfs="http://www.opengis.net/wfs"
xmlns:ogc="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd
">
        <wfs:Query typeName="csn:Ship">
                <wfs:PropertyName>csn:Ship</wfs:PropertyName>
                <ogc:Filter>
                        <ogc:And>
                                <ogc:BBOX>
                                        <ogc:PropertyName>pos</ogc:PropertyName>
                                        <gml:Envelope
srsName="http://www.opengis.net/gml/srs/epsg.xml#4326">
                                                <gml:lowerCorner>34.1669566773135
22.9559057282049</gml:lowerCorner>
                                                <gml:upperCorner>49.0494585186001
69.0107920007525</gml:upperCorner>
```

```
                                        </gml:Envelope>
                                </ogc:BBOX>
                                <ogc:PropertyIsBetween>
                                        <ogc:PropertyName>timeStamp</ogc:PropertyName>
                                        <ogc:LowerBoundary>
                                                <ogc:Literal>2013-03-18T00:00:00</ogc:Literal>
                                        </ogc:LowerBoundary>
                                        <ogc:UpperBoundary>
                                                <ogc:Literal>2013-03-18T06:00:00</ogc:Literal>
                                        </ogc:UpperBoundary>
                                </ogc:PropertyIsBetween>
                        </ogc:And>
                </ogc:Filter>
        </wfs:Query>
</wfs:GetFeature></wfs:GetFeature>
```

25.2 Web Map Service (WMS)

The WMS is used for serving raster data of EO images.

The end point for this service is: https://csndc.emsa.europa.eu/geoserver/wms

25.2.1 GetCapabilities

Example of GetCapabilities request.

https://csndc.emsa.europa.eu/geoserver/wms?REQUEST=GetCapabilities

25.2.2 GetMap

This is an example of get map request.

https://csndc.emsa.europa.eu/geoserver/wms?TRANSPARENT=TRUE&STYLES=&VERSION=1%2E1%2E1&WIDTH=717&UPSEQUENCE=2014-05-26T17%3A42%3A04Z&HEIGHT=738&FORMAT=image%2Fpng&BBOX=2557212%2E593%2C4105829%2E776%2C2761594%2E79%2C4316198%2E062&SRS=EPSG%3A3395&REQUEST=GetMap&LAYERS=001344%3A134351_RS2_20140626_043324_0075_SCWA_VV_SCW_333173_0000_0000000&SERVICE=WMS&EXCEPTIONS=text%2Fxml

25.3 Web Coverage Service (WCS)

This service is used to download EO images.

25.3.1.1 GetCapabilities

This is an example of GetCapabilities request.

https://csndc.emsa.europa.eu/geoserver/ows?service=WCS&version=1.0.0&request=GetCapabilities

25.3.1.2 DescribeCoverage

Here is an example of DescribeCoverage.

https://csndc.emsa.europa.eu/geoserver/ows?service=WCS&version=1.0.0&request=DescribeCoverage&coverage=000057:5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131

25.3.1.3 GetCoverage

This is an example of get coverage request.

https://csndc.emsa.europa.eu/geoserver/ows?service=WCS&version=1.0.0&request=GetCoverage&coverage=000057:5667_RS2_20110330_162728_0045_SCNA_HH_SGF_126262_3562_4984131&bbox=14.3861673,53.6627189,20.6672014,57.0901852&width=604&height=330&crs=EPSG:4326&format=geotiff

25.4 Catalogue Service on the Web (CSW)

This is used to store catalogue metadata of the EOP products.
The end poibnt for this service is: https://csndc.emsa.europa.eu:444/vcat-csw/services

25.4.1 GetCapabilities

This is an example of GetCapabilities request.

```
<GetCapabilities service="CSW" version="2.0.0" xmlns="http://www.opengis.net/cat/csw"
xmlns:ogc="http://www.opengis.net/ogc" xmlns:ows="http://www.opengis.net/ows"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.opengis.net/cat/csw
http://schemas.opengis.net/csw/2.0.0/CSW-discovery.xsd"/>
```

25.4.2 GetRecordById

Here is an example of GetrecordbyID request.

```
<GetRecordById xmlns="http://www.opengis.net/cat/csw/2.0.2" xmlns:wrs="http://www.opengis.net/cat/wrs/1.0"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" outputSchema="urn:oasis:names:tc:ebxml-
regrep:xsd:rim:3.0" service="CSW" version="2.0.2">
        <Id>urn:eop:CSNDC:product:RS2_20110729_075018_0042_SCNA_HH_SGF_145922_7024_5512937.zip
_0001</Id>
        <ElementSetName typeNames="rim:RegistryPackage">full</ElementSetName>
</GetRecordById>
```

25.4.3 GetRecords

This is an example of GetRecords request, using time range.

```
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml" xmlns:wrs="http://www.opengis.net/cat/wrs/1.0"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" outputSchema="urn:oasis:names:tc:ebxml-
regrep:xsd:rim:3.0" service="CSW" version="2.0.2" resultType="results" startPosition="1" maxRecords="50">
        <csw:Query typeNames="rim:ExtrinsicObject">
                <csw:ElementSetName typeNames="rim:ExtrinsicObject">full</csw:ElementSetName>
                <csw:Constraint version="1.1.0">
                        <ogc:Filter>
                                <ogc:And>
                                        <ogc:PropertyIsEqualTo>

        <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:PropertyName>
```

```
                                        <ogc:Literal>urn:x-ogc:specification:csw-
ebrim:ObjectType:EO:EOProduct</ogc:Literal>
                                    </ogc:PropertyIsEqualTo>
                                    <ogc:PropertyIsGreaterThanOrEqualTo>

        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name='urn:ogc:def:ebRIM-Slot:OGC-06-
131:beginPosition']/rim:ValueList/rim:Value</ogc:PropertyName>
                                        <ogc:Literal>2011-07-29T05:00:00Z</ogc:Literal>
                                    </ogc:PropertyIsGreaterThanOrEqualTo>
                                    <ogc:PropertyIsLessThanOrEqualTo>

        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name='urn:ogc:def:ebRIM-Slot:OGC-06-
131:endPosition']/rim:ValueList/rim:Value</ogc:PropertyName>
                                        <ogc:Literal>2011-07-29T12:00:00Z</ogc:Literal>
                                    </ogc:PropertyIsLessThanOrEqualTo>
                                </ogc:And>
                            </ogc:Filter>
                        </csw:Constraint>
        </csw:Query>
</csw:GetRecords>
```

Here is an example that uses both the time range and the bounding box to filter the data.

```
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml" xmlns:wrs="http://www.opengis.net/cat/wrs/1.0"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" outputSchema="urn:oasis:names:tc:ebxml-
regrep:xsd:rim:3.0" service="CSW" version="2.0.2" resultType="results" startPosition="1" maxRecords="50">
        <csw:Query typeNames="rim:ExtrinsicObject">
                <csw:ElementSetName typeNames="rim:ExtrinsicObject">full</csw:ElementSetName>
                <csw:Constraint version="1.1.0">
                        <ogc:Filter>
                                <ogc:And>
                                        <ogc:PropertyIsEqualTo>

        <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:PropertyName>
                                        <ogc:Literal>urn:x-ogc:specification:csw-
ebrim:ObjectType:EO:EOProduct</ogc:Literal>
                                        </ogc:PropertyIsEqualTo>
                                        <ogc:BBOX>

        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name='urn:ogc:def:ebRIM-Slot:OGC-06-
131:multiExtentOf']/wrs:ValueList/wrs:AnyValue</ogc:PropertyName>
                                        <gml:Envelope>
                                                <gml:lowerCorner>30.353663269790946
32.638410584669295</gml:lowerCorner>
                                                <gml:upperCorner>35.998633829394166
36.85228188307418</gml:upperCorner>
                                        </gml:Envelope>
                                        </ogc:BBOX>
                                        <ogc:PropertyIsGreaterThanOrEqualTo>

        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name='urn:ogc:def:ebRIM-Slot:OGC-06-
131:beginPosition']/rim:ValueList/rim:Value</ogc:PropertyName>
```

```
                                                <ogc:Literal>2011-07-29T05:00:00Z</ogc:Literal>
                                            </ogc:PropertyIsGreaterThanOrEqualTo>
                                            <ogc:PropertyIsLessThanOrEqualTo>

        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name='urn:ogc:def:ebRIM-Slot:OGC-06-
131:endPosition']/rim:ValueList/rim:Value</ogc:PropertyName>
                                                <ogc:Literal>2011-07-29T12:00:00Z</ogc:Literal>
                                            </ogc:PropertyIsLessThanOrEqualTo>
                                    </ogc:And>
                                </ogc:Filter>
                            </csw:Constraint>
        </csw:Query>
</csw:GetRecords>
```

25.5 Example of the GML files created for the AIS data

The AIS data obtained from IMDatE are provided by CSNDC in GML files that are typically distributed via FTP to the service providers.


```xml
<?xml version="1.0"?>
<wfs:FeatureCollection xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:ais="http://www.emsa.europa.eu/ais"
xmlns:gml="http://www.opengis.net/gml" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:ows="http://www.opengis.net/ows/1.1" xmlns:wfs="http://www.opengis.net/wfs" numberOfFeatures="10"
xsi:schemaLocation="http://www.emsa.europa.eu/ais ./STIRES_WFS.xsd http://www.opengis.net/wfs
http://schemas.opengis.net/wfs/1.1.0/wfs.xsd">
	<gml:featureMember>
		<ais:Feature>
			<ais:MMSI>212983026</ais:MMSI>
			<ais:IMONumber/>
			<ais:name/>
			<ais:callsign/>
			<ais:vesselType/>
			<ais:trackProperty>
				<ais:track>
					<ais:objectStatus>
						<ais:heading/>
						<ais:speedOverGround>0.0</ais:speedOverGround>
						<ais:time>2014-05-15T14:11:12.000+01:00</ais:time>
						<ais:destination/>
						<ais:expectedTimeOfArrival/>
						<ais:hazardous/>
						<ais:report/>
						<ais:courseOverGround>86.0</ais:courseOverGround>
						<ais:navigationalStatus/>
						<gml:Point>
							<gml:pos>34.67011 33.042291666666664</gml:pos>
						</gml:Point>
					</ais:objectStatus>
				</ais:track>
			</ais:trackProperty>
		</ais:Feature>
	</gml:featureMember>
	<gml:featureMember>
		<ais:Feature>
			<ais:MMSI>210480000</ais:MMSI>
			<ais:IMONumber/>
			<ais:name/>
			<ais:callsign/>
			<ais:vesselType/>
			<ais:trackProperty>
				<ais:track>
					<ais:objectStatus>
						<ais:heading/>
						<ais:speedOverGround>0.0</ais:speedOverGround>
						<ais:time>2014-05-15T14:12:27.000+01:00</ais:time>
```

```
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>0.0</ais:courseOverGround>
                                        <ais:navigationalStatus/>
                                        <gml:Point>
                                                <gml:pos>34.754738333333336
32.40886833333333</gml:pos>
                                        </gml:Point>
                                </ais:objectStatus>
                        </ais:track>
                </ais:trackProperty>
        </ais:Feature>
    </gml:featureMember>
    <gml:featureMember>
        <ais:Feature>
                <ais:MMSI>353880000</ais:MMSI>
                <ais:IMONumber>7435046</ais:IMONumber>
                <ais:name/>
                <ais:callsign>3EPH8</ais:callsign>
                <ais:vesselType>360</ais:vesselType>
                <ais:trackProperty>
                        <ais:track>
                                <ais:objectStatus>
                                        <ais:heading>257</ais:heading>
                                        <ais:speedOverGround>8.4</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:12:27.000+01:00</ais:time>
                                        <ais:destination>UAKHE</ais:destination>
                                        <ais:expectedTimeOfArrival>2014-05-
23T18:00:00Z</ais:expectedTimeOfArrival>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>258.4</ais:courseOverGround>
                                        <ais:navigationalStatus>0</ais:navigationalStatus>
                                        <gml:Point>
                                                <gml:pos>35.96948833333333 32.90166833333333</gml:pos>
                                        </gml:Point>
                                </ais:objectStatus>
                        </ais:track>
                </ais:trackProperty>
        </ais:Feature>
    </gml:featureMember>
    <gml:featureMember>
        <ais:Feature>
                <ais:MMSI>636091701</ais:MMSI>
                <ais:IMONumber>9420863</ais:IMONumber>
                <ais:name>VOGE TRUST</ais:name>
                <ais:callsign>A8RR2</ais:callsign>
                <ais:vesselType>310</ais:vesselType>
                <ais:trackProperty>
                        <ais:track>
                                <ais:objectStatus>
                                        <ais:heading>258</ais:heading>
```

```
                                        <ais:speedOverGround>13.6</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:12:32.000+01:00</ais:time>
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>260.0</ais:courseOverGround>
                                        <ais:navigationalStatus>0</ais:navigationalStatus>
                                        <gml:Point>
                                                <gml:pos>35.832323333333335 33.35104</gml:pos>
                                        </gml:Point>
                                </ais:objectStatus>
                        </ais:track>
                </ais:trackProperty>
        </ais:Feature>
</gml:featureMember>
<gml:featureMember>
        <ais:Feature>
                <ais:MMSI>450538000</ais:MMSI>
                <ais:IMONumber>7120768</ais:IMONumber>
                <ais:name>ABOU KARIM I</ais:name>
                <ais:callsign>ODVI</ais:callsign>
                <ais:vesselType>360</ais:vesselType>
                <ais:trackProperty>
                        <ais:track>
                                <ais:objectStatus>
                                        <ais:heading>91</ais:heading>
                                        <ais:speedOverGround>11.4</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:12:44.000+01:00</ais:time>
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>96.0</ais:courseOverGround>
                                        <ais:navigationalStatus>0</ais:navigationalStatus>
                                        <gml:Point>
                                                <gml:pos>33.896155 35.13968833333333</gml:pos>
                                        </gml:Point>
                                </ais:objectStatus>
                        </ais:track>
                </ais:trackProperty>
        </ais:Feature>
</gml:featureMember>
<gml:featureMember>
        <ais:Feature>
                <ais:MMSI>215486000</ais:MMSI>
                <ais:IMONumber/>
                <ais:name/>
                <ais:callsign/>
                <ais:vesselType/>
                <ais:trackProperty>
                        <ais:track>
                                <ais:objectStatus>
                                        <ais:heading/>
```

```
                                        <ais:speedOverGround>6.9</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:13:04.000+01:00</ais:time>
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>120.3</ais:courseOverGround>
                                        <ais:navigationalStatus/>
                                        <gml:Point>
                                                <gml:pos>34.82810833333333 33.84262</gml:pos>
                                        </gml:Point>
                                </ais:objectStatus>
                        </ais:track>
                </ais:trackProperty>
        </ais:Feature>
</gml:featureMember>
<gml:featureMember>
        <ais:Feature>
                <ais:MMSI>210735000</ais:MMSI>
                <ais:IMONumber/>
                <ais:name/>
                <ais:callsign/>
                <ais:vesselType/>
                <ais:trackProperty>
                        <ais:track>
                                <ais:objectStatus>
                                        <ais:heading/>
                                        <ais:speedOverGround>6.8</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:13:06.000+01:00</ais:time>
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>235.0</ais:courseOverGround>
                                        <ais:navigationalStatus/>
                                        <gml:Point>
                                                <gml:pos>34.79996666666667 33.5914</gml:pos>
                                        </gml:Point>
                                </ais:objectStatus>
                        </ais:track>
                </ais:trackProperty>
        </ais:Feature>
</gml:featureMember>
<gml:featureMember>
        <ais:Feature>
                <ais:MMSI>212983030</ais:MMSI>
                <ais:IMONumber/>
                <ais:name/>
                <ais:callsign/>
                <ais:vesselType/>
                <ais:trackProperty>
                        <ais:track>
                                <ais:objectStatus>
                                        <ais:heading/>
```

```
                                        <ais:speedOverGround>7.5</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:13:24.000+01:00</ais:time>
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>292.8</ais:courseOverGround>
                                        <ais:navigationalStatus/>
                                        <gml:Point>
                                                <gml:pos>35.04664666666667
32.372038333333336</gml:pos>
                                        </gml:Point>
                                    </ais:objectStatus>
                                </ais:track>
                            </ais:trackProperty>
                        </ais:Feature>
                    </gml:featureMember>
                    <gml:featureMember>
                        <ais:Feature>
                            <ais:MMSI>235094159</ais:MMSI>
                            <ais:IMONumber/>
                            <ais:name/>
                            <ais:callsign/>
                            <ais:vesselType/>
                            <ais:trackProperty>
                                <ais:track>
                                    <ais:objectStatus>
                                        <ais:heading/>
                                        <ais:speedOverGround>0.0</ais:speedOverGround>
                                        <ais:time>2014-05-15T14:13:36.000+01:00</ais:time>
                                        <ais:destination/>
                                        <ais:expectedTimeOfArrival/>
                                        <ais:hazardous/>
                                        <ais:report/>
                                        <ais:courseOverGround>41.5</ais:courseOverGround>
                                        <ais:navigationalStatus/>
                                        <gml:Point>
                                                <gml:pos>34.64698833333333
33.007978333333334</gml:pos>
                                        </gml:Point>
                                    </ais:objectStatus>
                                </ais:track>
                            </ais:trackProperty>
                        </ais:Feature>
                    </gml:featureMember>
                    <gml:featureMember>
                        <ais:Feature>
                            <ais:MMSI>671327000</ais:MMSI>
                            <ais:IMONumber>7108899</ais:IMONumber>
                            <ais:name>SAFI</ais:name>
                            <ais:callsign>5VBW7</ais:callsign>
                            <ais:vesselType>360</ais:vesselType>
                            <ais:trackProperty>
                                <ais:track>
```

```
                                        <ais:objectStatus>
                                                <ais:heading/>
                                                <ais:speedOverGround>0.0</ais:speedOverGround>
                                                <ais:time>2014-05-15T14:13:46.000+01:00</ais:time>
                                                <ais:destination>LBBEY</ais:destination>
                                                <ais:expectedTimeOfArrival>2014-05-
10T21:30:00Z</ais:expectedTimeOfArrival>
                                                <ais:hazardous/>
                                                <ais:report/>
                                                <ais:courseOverGround>23.1</ais:courseOverGround>
                                                <ais:navigationalStatus>5</ais:navigationalStatus>
                                                <gml:Point>
                                                        <gml:pos>33.90261666666667 35.5224</gml:pos>
                                                </gml:Point>
                                        </ais:objectStatus>
                                </ais:track>
                        </ais:trackProperty>
                </ais:Feature>
        </gml:featureMember>
</wfs:FeatureCollection>
```

26 Annex U - Event Notification Service

The CSN-DC can be configured to send event notification messages to a Sensor Event Service (SES). Event notification messages are sent for each geometry feature received by the CSN-DC, be it a EOP footprint, an oil spill or a detected vessel. A message is sent for each feature received, therefore for example if in a given OSN package, there are 5 oil spill, 5 different messages will be issued. The foreseen usage of this feature is that it sends messages to a centralised SES, which allows subscription of listeners (implementation of the SES is out of scope of the CSN-DC).

Here follow some examples of messages sent to the SES.

This is a message sent when an oil spill is received.


```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:eop="http://earth.esa.int/eop" xmlns:sar="http://earth.esa.int/sar"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:csn="http://www.emsa.europa.eu/csndc">
        <soap:Header>
                <wsa:To>http://twls10:81/ses/EventServiceStub.php</wsa:To>
                <wsa:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</wsa:Action>
                <wsa:MessageID>uuid:1b4d3025-f80a-a5b6-aa37-864c47fa1a7e</wsa:MessageID>
                <wsa:From>
                        <wsa:Address>http://www.w3.org/2005/08/addressing/role/anonymous</wsa:Address>
                </wsa:From>
        </soap:Header>
        <soap:Body>
                <wsnt:Notify>
                        <wsnt:NotificationMessage>
                                <wsnt:Topic xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:om="http://www.opengis.net/om/1.0" xmlns:sa="http://www.opengis.net/sampling/1.0"
Dialect="http://csndc.emsa.europa.eu/TopicExpression"> OilSpill </wsnt:Topic>
                                <wsnt:Message xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:om="http://www.opengis.net/om/1.0" xmlns:sa="http://www.opengis.net/sampling/1.0">
                                        <om:Observation gml:id="OM_2"
xsi:schemaLocation="http://www.opengis.net/om/1.0 http://schemas.opengis.net/om/1.0.0/om.xsd
http://www.opengis.net/sampling/1.0 http://schemas.opengis.net/sampling/1.0.0/sampling.xsd">
                                                <om:samplingTime>
                                                        <gml:TimeInstant xsi:type="gml:TimeInstantType">
                                                                <gml:timePosition>2011-05-
10T19:40:33</gml:timePosition>
                                                        </gml:TimeInstant>
                                                </om:samplingTime>
                                                <om:procedure xlink:href="http://csndc.emsa.europa.eu/"/>
                                                <om:observedProperty
xlink:href="urn:csndc:def:phenomenon:OilSpill"/>
                                                <om:featureOfInterest xlink:href=" http://twls10:7021/deegree-
wfs/services?SERVICE=WFS&amp;VERSION=1.1.0&amp;REQUEST=GetFeature&amp;TYPENAME=csn:OilSpill
&amp;Filter=%3CFilter%3E&lt;PropertyIsEqualTo&gt;&lt;PropertyName&gt;csn:eventid&lt;/PropertyName&gt;&lt;Lit
eral&gt;6587_ASA_WSM_1PNACS20110510_194033_000000612099_00415_48074_0001.N1.00000_OS_4&lt;/L
iteral&gt;&lt;/PropertyIsEqualTo&gt;&lt;/Filter&gt; ">
                                                        <sa:SamplingPoint gml:id="OS_001">
```

```
        <gml:name>6587_ASA_WSM_1PNACS20110510_194033_000000612099_00415_48074_0001.N1.0000
0_OS_4</gml:name>
                                                        <sa:sampledFeature xlink:href=""/>
                                                        <sa:position>
                                                                <gml:Point srsName="EPSG:4326">
                                                                        <gml:pos>
  34.990600 34.586300
 </gml:pos>
                                                                </gml:Point>
                                                        </sa:position>
                                                </sa:SamplingPoint>
                                        </om:featureOfInterest>
                                        <om:result>position</om:result>
                                </om:Observation>
                        </wsnt:Message>
                </wsnt:NotificationMessage>
        </wsnt:Notify>
    </soap:Body>
</soap:Envelope>
```


Here is an example of messages sent when an EO scene is received.


```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:eop="http://earth.esa.int/eop" xmlns:sar="http://earth.esa.int/sar"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:csn="http://www.emsa.europa.eu/csndc">
        <soap:Header>
                <wsa:To>http://twls10:81/ACSPhpLibRes/EventServiceStub.php</wsa:To>
                <wsa:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</wsa:Action>
                <wsa:MessageID>uuid:1b4d3025-f80a-a5b6-aa37-864c47fa1a7e</wsa:MessageID>
                <wsa:From>
                        <wsa:Address>http://www.w3.org/2005/08/addressing/role/anonymous</wsa:Address>
                </wsa:From>
        </soap:Header>
        <soap:Body>
                <wsnt:Notify>
                        <wsnt:NotificationMessage>
                                <wsnt:Topic xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:om="http://www.opengis.net/om/1.0" xmlns:sa="http://www.opengis.net/sampling/1.0"
Dialect="http://csndc.emsa.europa.eu/TopicExpression"> EOscene </wsnt:Topic>
                                <wsnt:Message xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:om="http://www.opengis.net/om/1.0" xmlns:sa="http://www.opengis.net/sampling/1.0">
                                        <om:Observation gml:id="OM_1"
xsi:schemaLocation="http://www.opengis.net/om/1.0 http://schemas.opengis.net/om/1.0.0/om.xsd
http://www.opengis.net/sampling/1.0 http://schemas.opengis.net/sampling/1.0.0/sampling.xsd">
                                                <om:samplingTime>
                                                        <gml:TimeInstant xsi:type="gml:TimeInstantType">
                                                                <gml:timePosition>2011-07-
19T21:58:17.26459Z</gml:timePosition>
                                                        </gml:TimeInstant>
```

```
                                                    </om:samplingTime>
                                                    <om:procedure xlink:href="http://csndc.emsa.europa.eu/"/>
                                                    <om:observedProperty
xlink:href="urn:csndc:def:phenomenon:EOscene"/>
                                                    <om:featureOfInterest xlink:href="http://twls10:7021/vcat-
csw/services?SERVICE=urn:x-ogc:specification:cswebrim:Service:OGC-
CSW:ebRIM&amp;REQUEST=GetRepositoryItem&amp;ID=urn:eop:CSNDC:product:ASA_WSM_1PXCLS201107
19_215817_00000135X000_00000_49081_2737.N1_0001">
                                                            <sa:SamplingPoint gml:id="EO_001">

        <gml:name>10569_ASA_WSM_1PXCLS20110719_215817_00000135X000_00000_49081_2737</gml:na
me>
                                                                    <sa:sampledFeature xlink:href=""/>
                                                                    <sa:position>
                                                                            <gml:Point srsName="EPSG:4326">
                                                                                    <gml:pos>47.635811 -
2.414139</gml:pos>
                                                                            </gml:Point>
                                                                    </sa:position>
                                                            </sa:SamplingPoint>
                                                    </om:featureOfInterest>
                                                    <om:result>position</om:result>
                                            </om:Observation>
                                    </wsnt:Message>
                            </wsnt:NotificationMessage>
                    </wsnt:Notify>
        </soap:Body>
</soap:Envelope>
```


Here is an example of messages sent when detected vessels are received. Please note that due to the constraints of the selected reference COTS (52North) it was decided to send a single message per detected vessel.


```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:wsa="http://www.w3.org/2005/08/addressing" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:eop="http://earth.esa.int/eop" xmlns:sar="http://earth.esa.int/sar"
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2" xmlns:csn="http://www.emsa.europa.eu/csndc">
        <soap:Header>
                <wsa:To>http://twls10:81/ACSPhpLibRes/test_nino.php</wsa:To>
                <wsa:Action>http://docs.oasis-open.org/wsn/bw-2/NotificationConsumer/Notify</wsa:Action>
                <wsa:MessageID>uuid:1b4d3025-f80a-a5b6-aa37-864c47fa1a7e</wsa:MessageID>
                <wsa:From>
                        <wsa:Address>http://www.w3.org/2005/08/addressing/role/anonymous</wsa:Address>
                </wsa:From>
        </soap:Header>
        <soap:Body>
                <wsnt:Notify>
                        <wsnt:NotificationMessage>
                                <wsnt:Topic xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:om="http://www.opengis.net/om/1.0" xmlns:sa="http://www.opengis.net/sampling/1.0"
Dialect="http://csndc.emsa.europa.eu/TopicExpression"> Vessel</wsnt:Topic>
```

```
                                <wsnt:Message xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
xmlns:om="http://www.opengis.net/om/1.0" xmlns:sa="http://www.opengis.net/sampling/1.0">
                                        <om:Observation gml:id="OM_1"
xsi:schemaLocation="http://www.opengis.net/om/1.0 http://schemas.opengis.net/om/1.0.0/om.xsd
http://www.opengis.net/sampling/1.0 http://schemas.opengis.net/sampling/1.0.0/sampling.xsd">
                                                <om:samplingTime>
                                                        <gml:TimeInstant xsi:type="gml:TimeInstantType">
                                                                <gml:timePosition>2012-01-
28T09:27:40</gml:timePosition>
                                                        </gml:TimeInstant>
                                                </om:samplingTime>
                                                <om:procedure xlink:href="http://csndc.emsa.europa.eu/"/>
                                                <om:observedProperty
xlink:href="urn:csndc:def:phenomenon:Vessel"/>
                                                <om:featureOfInterest xlink:href="http://twls10:7021/deegree-
wfs/services?SERVICE=WFS&amp;VERSION=1.1.0&amp;REQUEST=GetFeature&amp;TYPENAME=csn:Ship&amp;Filter=&lt;Filter&gt;&lt;PropertyIsEqualTo&gt;&lt;PropertyName&gt;csn:id&lt;/PropertyName&gt;&lt;Literal&gt;20018_ASA_WSM_1PNACS20120128_092716_000000612107_00165_51846_0001.N1.00000_DS_21&lt;/Literal&gt;&lt;/PropertyIsEqualTo&gt;&lt;/Filter&gt;">
                                                        <sa:SamplingPoint gml:id="DS_001">

        <gml:name>20018_ASA_WSM_1PNACS20120128_092716_000000612107_00165_51846_0001.N1.00000_DS_12</gml:name>
                                                                <sa:sampledFeature xlink:href=""/>
                                                                <sa:position>
                                                                        <gml:Point srsName=" EPSG:4326">
                                                                                <gml:pos>42.825300
10.347000</gml:pos>
                                                                        </gml:Point>
                                                                </sa:position>
                                                        </sa:SamplingPoint>
                                                </om:featureOfInterest>
                                                <om:result>position</om:result>
                                        </om:Observation>
                                </wsnt:Message>
                        </wsnt:NotificationMessage>
                </wsnt:Notify>
        </soap:Body>
</soap:Envelope>
```

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