NGEO

NGEO METADATA REPORT FILE GENERIC INTERFACE

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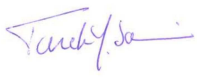
Approved by:	Tarek Habib	Magellium Limited	2012-11-23	
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Document Change Record

Iss.	Rev.	Date	Reason	Comments
1	0	2011-08-31	PDR Delivery	
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1	1	2011-11-16	PDR-186 (RID 476)	Removed incorrect items from Table 8
1	1	2011-11-16	PDR-346 (RID 91)	Corrected section references
1	1	2011-11-16	PDR-353 (RID 36)	Use of ngeo.eo.esa.int as the namespace for ngEO
1	1	2011-11-16	PDR-379 (RID 10)	Removed text copied from the draft
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1	1	2011-11-22	PDR-153 (RID 523) RID 477	Added clarification on the delete report in §3.1.4
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1	1	2011-11-22	PDR-128 (RID 557) PDR-301 (RID 197) PDR-312 (RID 170) PDR-380 (RID 9) PDR-303 (RID 194)	The tables of EOP elements and their applicability in ngEO have been updated
1	1	2011-11-22	PDR-189 (RID 469)	Added a bulk delete possibility in the delete Report in §4.3.3.2.1
1	1	2011-11-22	PDR-154 (RID 522)	Replace the term "bulk update" by "bulk replace" to avoid confusion in §3.1.2
1	1	2011-12-06	PDR-290 (RID 227)	Added clarification on insertion or replacement in §3.1.2
1	1	2011-12-06	PDR-297 (RID 213)	Added a note concerning the

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1	1	2011-12-06	PDR-305 (RID 186)	Added a column type in EOP attributes mapping
1	1	2011-12-06	PDR-308 (RID 9)	Changed cardinality of attributes needed to find the dataset association
1	1	2011-12-06	PDR-187 (RID 475)	Modification of §3.1.1
1	1	2011-12-06	PDR-252 (RID 300)	Added CANCELLED and ACQUIRED status in eop:status
1	1	2011-12-06	RID 93	Figure 2 updated
1	1	2011-12-06	RID 298	§ 5.1.7: Added CDS specific cases or references
1	1	2011-12-06	RID 424	§ 3.1.2, 4.1: Clarifications on rep:metadataReport element
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1	2	2012-03-22	PPDR-119 (RID AC-33)	§ 5: RID references removed
1	2	2012-03-22	PPDR-120 (RID OB-53)	§ 4.1.3.3: Sentinel-1 example revised
1	2	2012-03-22	PPRD-35 (RID S2-80701/86/AC_S2_17)	§ 4.1.3.3, 5, xsd schemas: eop:timeliness removed
1	2	2012-03-22	Internal review	§ 3.1.3, 4.2.3.2.5, 4.2.3.3 , 5: Attribute Id added for every product metadata used in ngEO. Attribute id is used in MetadataUpdateReport rather than XPath. Annex A removed and replaced by § 4.2.3.3
1	3	2012-07-06	OB-89	Corrected cardinality of rep:productDelitionItem from 0->infinity to 1->infinity in table 15

1	4	2012-11-23	NGEOD-23	Clarify that mask attributes are ignored by NGEO
1	4	2012-11-23	NGEOD-16	Bulk Relplace/Update fixes

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1 Introduction

1.1 Purpose

The purpose of this Interface Control Document is to **describe the content of the metadata reports sent by the Product Facilities and the Mission Planning Facilities to the ngEO system** to be delivered as part of Task 1 of the Next Generation User Services For Earth Observation (ngEO) project.

The metadata reports described in this document include:

- Metadata Report File Interface for both archived and planned products
- Delete Metadata Report File Interface
- Update Metadata Report File Interface

It is a document that captures specific aspects of the ngEO system, and as such does not have meaning in isolation. For its relation to other ngEO documents, and its place within the ngEO system, please refer to section 2 of this document.

The content of this document is largely based on the ngEO Metadata Draft ICD [GMES-GSEG-EOPG-IS-11-0018] that it replaces.

1.2 Document structure

This document is structured in the following way:

Section 1 **Introduction**

Section 2 **System Context**

Provides the context for the interface in the ngEO project, placing the interface in relation to ngEO subsystems and other ngEO interfaces. This contextual description is achieved through the customisation of a standard system schematic and a discursive presentation.

Section 3 **Interface Description**

Detailed description of the identified interfaces. This description is at a semantic level and explains the interface within its wider system context, giving examples of system scenarios that use the interface.

Section 4 **Interface Specification**

Here the interfaces are formally described in formal terms, this description consisting in the specification of the interface content (the exchanged objects).

1.3 Related documents

1.3.1 Applicable documents

The following documents are applicable. For dated or versioned references, subsequent revisions do not apply.

Code	Reference	Title
[ngEO-SRD]	ngEO-13-SRD-MFR-004	ngEO System Requirement Document Issue 1.4
[ngEO-GLOSS]	ngEO-02-TN-MFR-013	ngEO Glossary Issue 1.1
[OGC 10-157]	OGC 10-157r1	Earth Observation Metadata profile of Observations & Measurements
[OGC 07-036]	OGC 07-036	Geography Markup Language
[OGC 10-004]	OGC 10-004r1	Observation & Measurement
[EarthExplorer]	PE-TN-ESA-GS-0001 v1.4	Earth Explorer Ground Segment File Format Standard
[ngEO-SARD]	ngEO-13-ADD-MFR-018	ngEO System Architectural Design Document Issue 1.2

Table 1 – List of applicable documents

1.3.2 Reference documents

The following documents are referenced for supporting information

Code	Reference	Title
[ngEO-MICD]	ngEO-13-ICD-MFR-019	Master Interface Control Document Issue 1.2
[ngEO-EICD-S1]	ngEO-13-ICD-DLR-065	External ICD for Sentinel-1 Issue 1.3
[ngEO-EICD-S2]	ngEO-13-ICD-DLR-066	External ICD for Sentinel-2 Issue 1.2
[ngEO-EICD-S3]	ngEO-13-ICD-DLR-067	External ICD for Sentinel-3 Issue 1.2
[ngEO-EICD-EC]	ngEO-13-ICD-DLR-068	External ICD for EarthCare PDGSs
[ngEO-EICD-CDS]	ngEO-13-ICD-DLR-069	External ICD for CDS Issue 1.2
[ngEO-EICD-VA]	ngEO-13-ICD-DLR-071	External ICD for Virtual Archive Issue 1
[ngEO-EICD-F]	ngEO-14-ICD-TPZ-086	External ICD for ngEO Feed
[ngEO-SSRD-C]	ngEO-14-SRD-TPZ-009	Subsystem Requirement Document for ngEO Catalogue Server Issue 1.1
[ngEO-EICD-C]	ngEO-14-ICD-TPZ-087	External ICD for ngEO Catalogue Issue 1.1
[ngEO-BRGICD]	ngEO-13-ICD-MFR-059	ngEO Browse Report File Generic Interface

		Issue 1.5
[ngEO-DAGICD]	ngEO-13-ICD-MFR-020	ngEO Data Access Generic Interface Issue 1.2
[ISO-19156]	OGC 10-004r1 ISO/DIS 19156:2010	Observations and Measurements
[ISO-19136]	OGC 07-036 ISO 19136:2007	Geography Markup Language, version 3.2.1
[GSCDA-MD]	OSME-GSCDA-SEDA-TN-09-0201	GSCDA Metadata and Filename Value Convention

Table 2 – List of reference documents

1.4 Applicable Standards

Various standards are applicable to the product metadata reports defined in this document:

- **[XML]** : eXtended Markup Language 1.0
  All product metadata reports are defined in XML and must, then, comply with this language specification

- **[OGC 10-157]** : Earth Observation Metadata profile of Observations & Measurements
  This specification has been developed in the context of the HMA project initiated by ESA. It defines Earth Observation products (EO Products) metadata based on the Observation model provided in [ISO-19156] and based on GML 3.2.1 ([ISO-19136]).
  The Earth Observation profile defined in [OGC 10-157] is used to provide complete metadata for EO Products in a generic way. The several thematic models described in the specification can be tailored for every mission.
  Several elements required by ngEO have been proposed to OGC in the frame of the revision process of this specification (see section 5).

- **[EarthExplorer]** : Earth Explorer Ground Segment File Format Standard
  This specification defines a file structure along with file name convention. Only the file name convention is applicable for this ICD (see section 3.1.5).

1.5 Glossary

The [ngEO-GLOSS] document provides a general glossary for definitions and acronyms used in all the ngEO project documentation.

2 Overview

2.1 The ngEO project

The objective of the ngEO project is to design the next generation of ESA online user services, where the main focus will be on an operational data access service across GMES and non GMES missions.

In a first phase, the architecture will be designed, the output being a full set of specifications for the implementation of the ngEO system components and its instances.

The present Interface Control Document is one of many technical deliverables that form part, or contribute to, the overall specification of the ngEO system and subsystems. Its precise role in the overall ngEO context and its location in the ngEO documentation hierarchy is given in section 2.2 below.

The ngEO system will be implemented in a second phase, which will be initiated through a Best Practice ITT to select the best offers for the implementation and configuration of the ngEO instances.

2.2 Role of this ICD in the ngEO System

The role of this ICD is to define, in a generic manner and across all possible sources (Product Facilities, Mission Planning Facilities), the EO Product Metadata which is collected by the Feed component for input into the ngEO system.

What this document does:

- It defines the generic metadata model through a customization of the HMA EOP model.
- It defines the metadata Report message embedding this generic metadata model for ingestion of new products.
- It defines the metadata Update Report message allowing replacing part of product metadata or providing new associations with datasets.
- It defines the metadata Delete Report message allowing deleting a whole product metadata or removing associations with datasets.

What this document does not do:

- Provide the complete customization of this generic metadata model in the context of a specific mission (see the various mission-specific External ICDs)
- Describe in detail the functionality of the Feed component that is used to process these reports issued from the Product Facilities (see [ngEO-EICD-F])

This ICD has an impact on a number of documents (shown in green in the figure below) within the ngEO system:

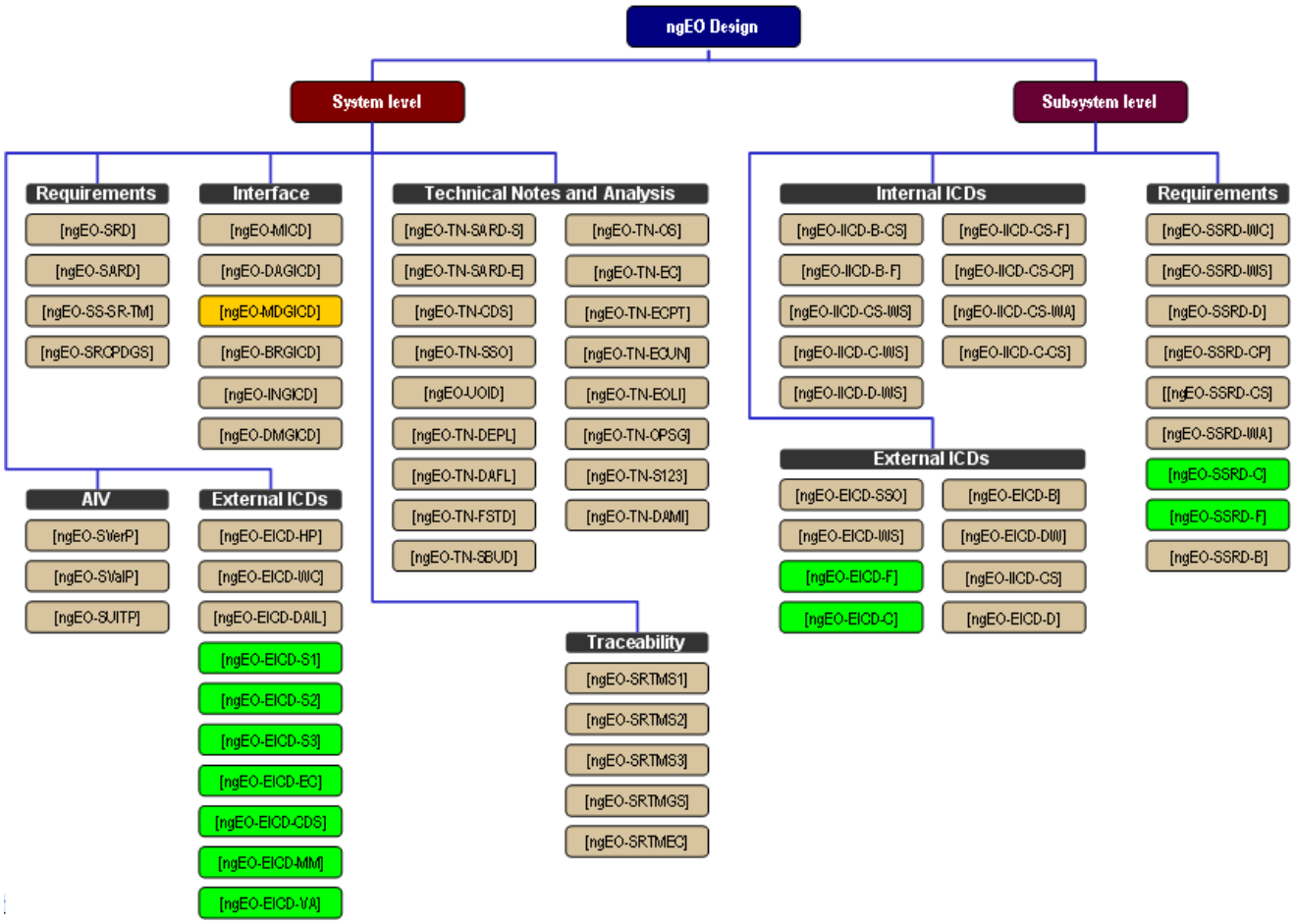

Figure 1 - Place of this ICD in the ngEO documentation Tree

2.3 ICD Summary

This ICD covers primarily the **format of the Metadata reports that are passed by the Feed component to the ingestion service of the Catalogue Server** allowing to:

- define new product metadata
- perform partial update of product metadata
- delete product metadata

The content of these metadata reports **should be provided to the Feed by the various Product Facilities or Mission Facilities using the same Metadata report format**: in that case the Feed component task is essentially to check the content of metadata and forward it to the right Catalogue Server.

However, **in some cases, the Product/Mission Facilities might not be able to provide metadata reports in the form described in this ICD**, e.g.:

- The metadata is based on a previous version of the HMA EO Product model that should be upgraded
- The Product Facility cannot "push" metadata and the Feed component should, conversely, generate metadata reports through a specific mechanism that "scans" the Product Facility resources.

In that case, a dedicated process (or plugin) of the Feed component should be developed in order to adapt/generate the Product/Mission Facilities metadata. **The tailoring of the metadata provided by a Product Facility and the possible use of a Feed plugin in order to upgrade this metadata before sending it to the Catalogue Server is detailed in the mission-specific External ICD.**

The following figure highlights the various flows introduced above:

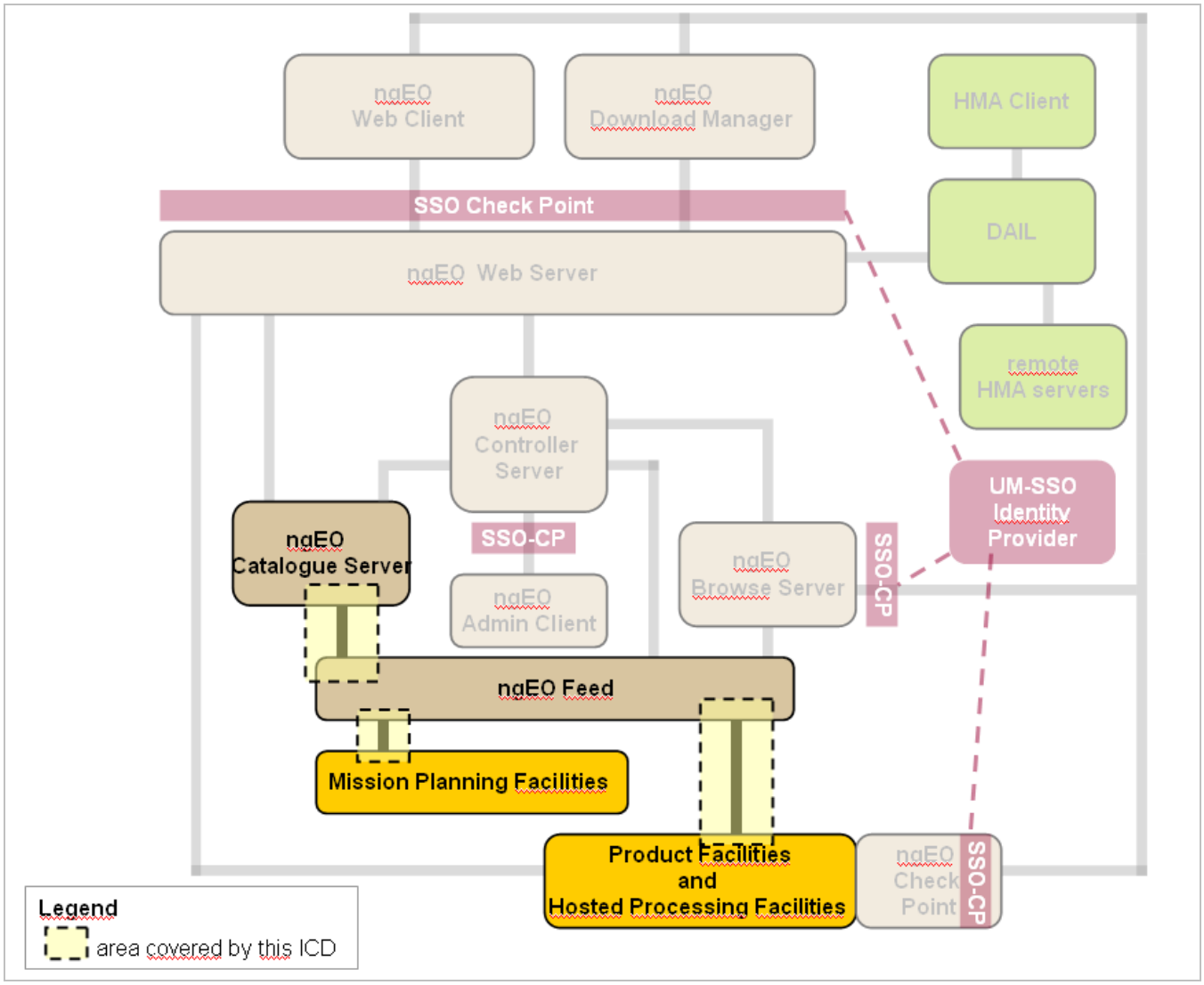

Figure 2 - Area covered by this ICD

3 Interface Description

3.1 Ingestion Flows

3.1.1 Interface Logic

The three interfaces described in this document define the content of the Reports expected by the Catalogue Servers of the ngEO system in order to store/update/delete product metadata issued by the Product Facilities.

These three interfaces are "**static**", i.e. they **don't cover the dynamics of the exchanges between the Product Facilities and the ngEO system** that are explained in detail in [ngEO-EICD-F]. However, a brief summary is provided below:

- A Product Facility discloses the metadata reports copying them in one basket (either managed by the Product Facility itself or by the Feed component).
- The Feed component performs parallel polling on several baskets, using possibly different protocols. In that context, it discovers that new metadata report files have been copied.
- The Feed component retrieves the reports (removing them from the basket) and processes them:
    - Checking their content
    - Updating their format, if required (e.g. to upgrade product metadata from the GML 3.1.1 based version to the 3.2.1 one)
    - Splitting them, if their content should be transferred to various Catalogue Servers.
    - Forwarding the right report to the right Catalogue Server ingestion service.

Error management shall also be described in [ngEO-EICD-F].

It is also important to note that the Feed component acts as a mediating component between a Product Facility and the Catalogue Server. As introduced in section 2.3, **some Product Facility might provide metadata not completely in line with the one described in this document** (the Feed component being in charge, in that case, of performing the required update). In that case, the metadata tailoring is detailed in the mission-specific External ICD.

Finally, please notice that in ngEO, **product metadata and browse images are not explicitly related**. In other words, the product metadata stored in the ngEO Catalogue Server doesn't contain any reference to browse images and browse metadata doesn't refer explicitly to any product. Conversely, **browse images are handled in ngEO through separate Browse Reports described in [ngEO-BRGICD]**.

3.1.2 Interface IF-ngEO-MetadataReport

Incoming metadata can be either inserted (if not present) or can replace existing metadata.

This interface allows a Product Facility to:

- Provide **complete metadata for new products**.

  This is the most obvious case where new product metadata is completely defined using the model described in section 5.

- Provide **complete metadata replacement for existing products**.

  If metadata is provided with an identifier that refers to a product already existing in the Catalogue Server, all product metadata will be replaced. Note that partial update is possible through the IF-ngEO-MetadataUpdateReport interface (see section 3.1.3).

- Perform a **bulk replace** of a Catalogue.

  In the case of a bulk replace, the Report contains, in addition to product metadata to be inserted, a "replacement header". This header gives a period of time and one or more mission/sensor/sensor mode/product type criteria that will be used to select existing product metadata that will be removed from the catalogue prior to the insertion.

  The mission/sensor/sensor mode/product types must be consistent with the corresponding values present in the new product metadata. In other words, it is not possible to request through that report the deletion of the product metadata having a specific mission/sensor/sensor mode/product type combination if no replacement metadata is provided in the same report.

The detail of the report is described in section 4.1.

3.1.3 Interface IF-ngEO-MetadataUpdateReport

This interface can be used by a Product Facility to:

- Provide **partial metadata update for existing products**.

  The complete subset of metadata fields subject to be updated through that mechanism is provided in annex **Error! Reference source not found.**.

- **Add or remove additional dataset/collection references for existing products**.

  Some Product Facilities manage the concept of dataset/collection that regroups lists of products.

  Due to a limitation of the underlying model, only one association can be declared for new product metadata (see the parentIdentifier field in section 5.1.7). This update interface must then be used by the Product Facility to declare additional dataset/collections associations, if any.

  The associations between product and Product Facilities dataset/collections are provided to ngEO that can use them, if configured accordingly, to automatically generate association between the product and one or more ngEO logical datasets. Removing the

association will have, indeed, the reverse impact (i.e. if some associations to ngEO logical datasets were due to the presence of a specific Product Facilities dataset/collections reference, removing the later will remove the associations to ngEO logical datasets).

- Perform a **bulk update** of a Catalogue.

  In the case of bulk update, the Product Facility should follow the strcture of the productBulkUpdateGroup (section 4.2.3.2.3). The Product Facility should provide a beginDate and an endDate as well as a list of the attributes to be updates (e.g. quality parameters). For a full list of updatable attributes, please refer to section 4.2.3.3.

The products affected by these changes are indicated by their identifier. Their mission/sensor/sensor mode/product type are also provided, as this information is required by the Feed to find out the right Catalogue Server to contact.

The detail of the report is described in section 4.2.

3.1.4 Interface IF-ngEO-MetadataDeleteReport

This interface allows a Product Facility to delete product metadata, providing the reference to the product identifiers (along with their mission/sensor/sensor mode/product type, required by the Feed to find out the right Catalogue Server to contact). This removes all metadata associated to a given product.

The detail of the report is described in section 4.3.

3.1.5 Metadata Report Filename convention

Any file naming convention can be used provided that the filename is unique for any given report file and that the file name contains a date/time allowing to sort them.

File naming convention should be detailed in the missions specific ICDs.

3.1.6 XML namespaces

The content of the Reports detailed in the following sections is based on several XML vocabularies, each of them being defined in a specific namespace.

The table below lists the several XML namespaces and the conventional prefix they are mapped to. These prefixes are used all throughout this document.

XML namespace	Prefix	Vocabulary description	Defined in
`http://ngeo.eo.esa.int/ngEO/report`	rep	Metadata report specific elements	This document
`http://www.opengis.net/eop/2.0`	eop	Earth Observation basic vocabulary	[OGC 10-157]
`http://www.opengis.net/alt/2.0`	alt	altimetery products	[OGC 10-157]
`http://www.opengis.net/atm/2.0`	atm	atmospheric products	[OGC 10-157]
`http://www.opengis.net/lmb/2.0`	lmb	limb looking products	[OGC 10-157]

XML namespace	Prefix	Vocabulary description	Defined in
http://www.opengis.net/opt/2.0	opt	optical products	[OGC 10-157]
http://www.opengis.net/sar/2.0	sar	radar products	[OGC 10-157]
http://www.opengis.net/ssp/2.0	ssp	Synthesis and Systematic products	[OGC 10-157]
http://www.opengis.net/om/2.0	om	Observation & Measurement vocabulary	[OGC 10-004]
http://www.opengis.net/gml/3.2	gml	Geography Markup Language	[OGC 07-036]

Table 3 –namespaces used in metadata reports

4 Interface Specification

4.1 Flow IF-ngEO-MetadataReport

4.1.1 Applicable standards

Applicable standards to the content of this interface are [XML] and [OGC 10-157] (see section 5 for a tailoring of this standard).

4.1.2 Protocol

This ICD defining only a data model to be exchanged, the protocol used is outside the scope of the present document:

- The protocol used between the Product Facilities and the Feed (IF-ngEO-FeedPolling) is defined in [ngEO-EICD-F].
- The protocol used between the Feed and the Catalogue Server (IF-ngEO-MetadataIngestion) is defined in [ngEO-EICD-C].

4.1.3 Content

4.1.3.1 Schema

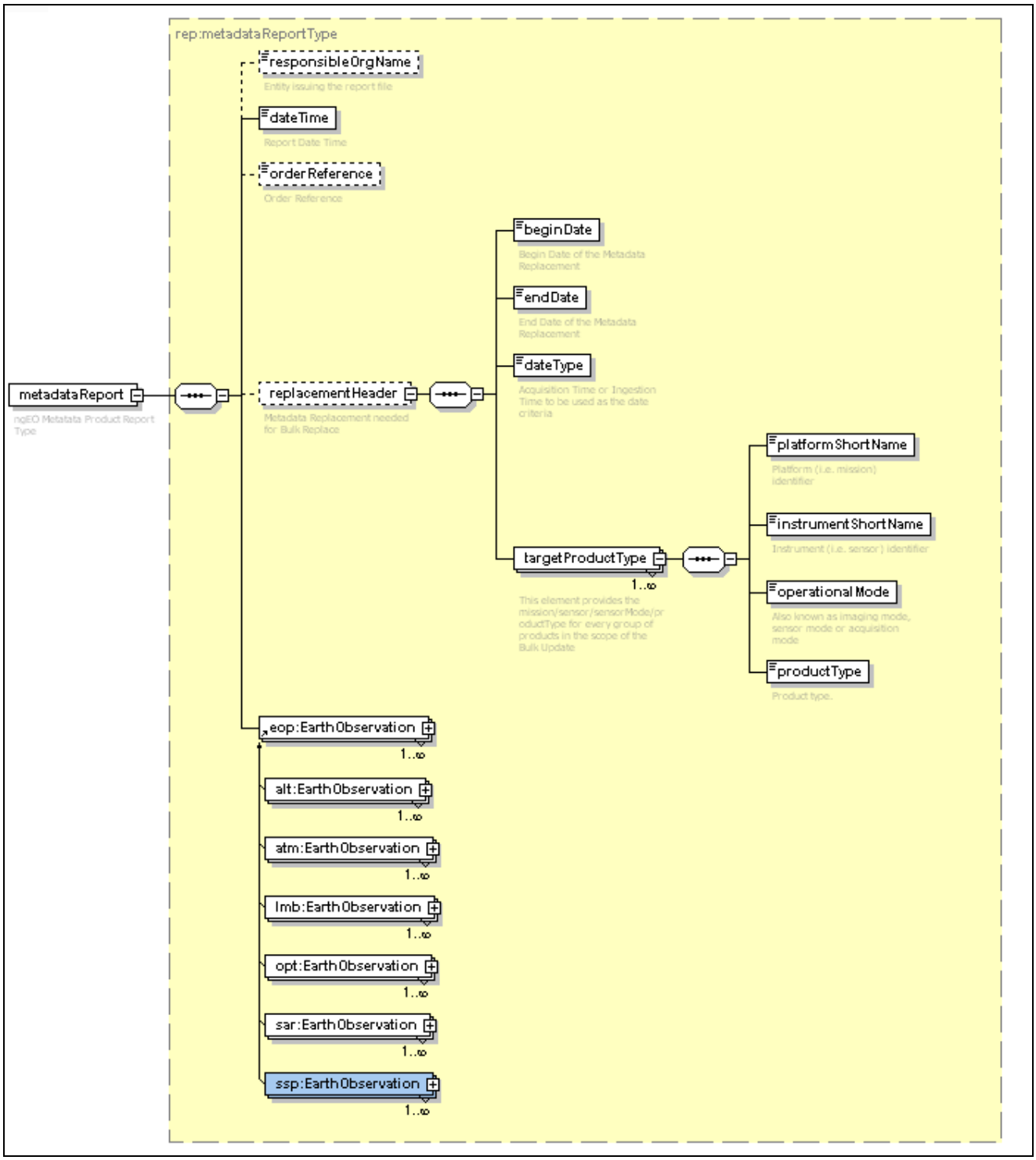

Figure 3 – `rep:metadataReport` element structure

4.1.3.2 Elements

Note: the Metadata Report being an upgraded version of the GSCDA Archiving Report, the following tables list in a specific column the differences with respect to this GSCDA Archiving Report format.

4.1.3.2.1 `rep:metadataReport` root element

XML element or attribute	Description	Definition	Main differences with GSCDA Archiving Report
version attribute	version of Metadata Report XML Schema	Cardinality: 1 (mandatory) Fixed value: 1.0	
rep:responsibleOrgName	Entity issuing the report file	Type: xs:string Cardinality: 0,1	Changed the cardinality from mandatory to "0 to 1"
rep:dateTime	Report Date Time	Type: xs:dateTime Cardinality: 1 (mandatory)	
rep:orderReference	Order Reference	Type: xs:string Cardinality: 0,1	Changed the cardinality from mandatory to "0 to 1"
rep:replacementHeader	Metadata Replacement Time window (needed for Bulk Replace)	Cardinality: 0,1	New element in order to manage a time-window (start and stop date) for the Metadata replacement in case of bulk replace.
eop:EarthObservation	Product Metadata. This base eop:EarthObservation element can be replaced by: alt:EarthObservation for altimetery products atm:EarthObservation for atmospheric products lmb:EarthObservation for limb looking products opt:EarthObservation for optical products sar:EarthObservation for radar products ssp:EarthObservation for "Synthesis and Systematic" products	Cardinality: 1 (mandatory),n See section 5 and following	Metadata information model is now based on O&M Observation model and GML 3.2.1

Table 4 –`rep:metadataReport` element content

4.1.3.2.2 `rep:replacementHeader` element

This element is required in the case of a bulk replace. if it is set then the catalogue shall delete all items matching its attributes before inserting products.

XML element or attribute	Description	Definition	Main differences with GSCDA Archiving Report
rep:beginDate	Begin date of the replacement	Type: xs:dateTime Cardinality: 1 (mandatory)	New
rep:endDate	End date of the replacement	Type: xs:dateTime Cardinality: 1 (mandatory)	New
rep:dateType	To dermine either to consider acquisition or ingestion time as the date criteria Possible values are INGESTION_TIME or ACQUISITION_TIME	Type: xs:string Cardinality: 1 (mandatory)	New
rep:targetProductType	Explicit definition of every group of mission/sensor/sensor mode/product type to be replaced	Cardinality: 1 (mandatory)	New
rep:targetProductType/ rep:platformShortName	Platform (i.e. mission) identifier	Type: xs:string Cardinality: 1 (mandatory)	New
rep:targetProductType/ rep:instrumentShortName	Instrument (i.e. sensor) identifier	Type: xs:string Cardinality: 1 (mandatory)	New
rep:targetProductType/ rep:operationalMode	Operational mode (also known as imaging mode, sensor mode or acquisition mode)	Type: xs:string Cardinality: 1 (mandatory)	New
rep:targetProductType/ rep:productType	Product Type	Type: xs:string Cardinality: 1 (mandatory)	New

Table 5 –rep:replacementHeader element content

4.1.3.3 Instantiation

Below is provided an example of report containing metadata for one Sentinel 1 product, without any bulk replacement order.

The gml:id attributes are inherited from GML and are mandatory. The values of these attributes must be unique in the whole XML file. However, please note that they will be ignored by ngEO and can, thus, be automatically generated when creating the XML file.

```
<rep:metadataReport version="1.1" xmlns:rep="http://ngeo.eo.esa.int/ngEO/report"
xmlns:eop="http://www.opengis.net/eop/2.0" xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:om="http://www.opengis.net/om/2.0" xmlns:ows="http://www.opengis.net/ows/2.0"
xmlns:sar="http://www.opengis.net/sar/2.0" xmlns:swe="http://www.opengis.net/swe/1.0"
xmlns:xlink="http://www.w3.org/1999/xlink" xsi:schemaLocation="http://ngeo.eo.esa.int/ngEO/report
../metadataReport/IF-ngEO-MetadataReport-0.1.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
 <rep:reportType>ARCHIVING</rep:reportType>
 <rep:dateTime>2011-08-17T09:30:47Z</rep:dateTime>
 <sar:EarthObservation gml:id="ID_1">
   <om:phenomenonTime>
     <gml:TimePeriod gml:id="tp_1">
       <gml:beginPosition>2001-08-22T11:02:47.000</gml:beginPosition>
       <gml:endPosition>2001-08-22T11:02:47.999</gml:endPosition>
```

```
      </gml:TimePeriod>
    </om:phenomenonTime>
    <om:resultTime>
      <gml:TimeInstant gml:id="archivingdate_1">
        <gml:timePosition>2001-08-22T11:02:47.999</gml:timePosition>
      </gml:TimeInstant>
    </om:resultTime>
    <om:procedure>
      <eop:EarthObservationEquipment gml:id="eoe_1">
        <eop:platform>
          <eop:Platform>
            <eop:shortName>Sentinel-1</eop:shortName>
            <eop:serialIdentifier>A</eop:serialIdentifier>
          </eop:Platform>
        </eop:platform>
        <eop:instrument>
          <eop:Instrument>
            <eop:shortName>SAR</eop:shortName>
          </eop:Instrument>
        </eop:instrument>
        <eop:sensor>
          <eop:Sensor>
            <eop:sensorType>RADAR</eop:sensorType>
            <eop:operationalMode codeSpace="urn:eop:SEN1:sensorMode">SM_SP</eop:operationalMode>
            <eop:swathIdentifier>EW</eop:swathIdentifier>
          </eop:Sensor>
        </eop:sensor>
        <eop:acquisitionParameters>
          <sar:Acquisition>
            <eop:orbitNumber>12</eop:orbitNumber>
            <eop:orbitDirection>ASCENDING</eop:orbitDirection>
            <eop:wrsLongitudeGrid codeSpace="">9</eop:wrsLongitudeGrid>
            <eop:startTimeFromAscendingNode uom="ms">4800000</eop:startTimeFromAscendingNode>
            <eop:completionTimeFromAscendingNode uom="ms">4800999</eop:completionTimeFromAscendingNode>
            <sar:polarisationMode>D</sar:polarisationMode>
            <sar:polarisationChannels>HH, HV</sar:polarisationChannels>
          </sar:Acquisition>
        </eop:acquisitionParameters>
      </eop:EarthObservationEquipment>
    </om:procedure>
    <om:observedProperty nilReason="inapplicable"/>
    <om:featureOfInterest>
      <eop:Footprint gml:id="fp_1">
        <eop:multiExtentOf>
          <gml:MultiSurface gml:id="ms_1" srsName="EPSG:4326">
            <gml:surfaceMembers>
              <gml:Polygon gml:id="fppoly_1">
                <gml:exterior>
                  <gml:LinearRing>
                    <gml:posList>2.1025 43.516667 2.861667 43.381667 2.65 42.862778 1.896944 42.996389
2.1025 43.516667</gml:posList>
                  </gml:LinearRing>
                </gml:exterior>
              </gml:Polygon>
            </gml:surfaceMembers>
          </gml:MultiSurface>
        </eop:multiExtentOf>
        <eop:centerOf>
          <gml:Point gml:id="p1" srsName="EPSG:4326">
            <gml:pos>2.374167 43.190833</gml:pos>
          </gml:Point>
        </eop:centerOf>
      </eop:Footprint>
    </om:featureOfInterest>
    <om:result>
      <eop:EarthObservationResult gml:id="eor_1">
        <eop:product>
          <eop:ProductInformation>
            <eop:fileName>
              <ows:ServiceReference xlink:href="http://productURL">
                <ows:RequestMessage/>
              </ows:ServiceReference>
            </eop:fileName>
```

```
          </eop:ProductInformation>
        </eop:product>
      </eop:EarthObservationResult>
    </om:result>
    <eop:metaDataProperty>
      <eop:EarthObservationMetaData>
        <eop:identifier>SEN1_GRA1A_20010822110247_TLS_PX_E123N45_0101_01234</eop:identifier>
        <eop:parentIdentifier>EUROPER_SAR_COL1</eop:parentIdentifier>
        <eop:acquisitionType>NOMINAL</eop:acquisitionType>
        <eop:productType>SAR_SM</eop:productType>
        <eop:status>ARCHIVED</eop:status>
        <eop:downlinkedTo>
          <eop:DownlinkInformation>
            <eop:acquisitionStation codeSpace="urn:eop:SEN1:stationCode">TLS</eop:acquisitionStation>
          </eop:DownlinkInformation>
        </eop:downlinkedTo>
        <eop:archivedIn>
          <eop:ArchivingInformation>
            <eop:archivingCenter codeSpace="urn:eop:SEN1:stationCode">TLS</eop:archivingCenter>
            <eop:archivingDate>2001-08-22T11:02:47.999</eop:archivingDate>
          </eop:ArchivingInformation>
        </eop:archivedIn>
        <eop:imageQualityStatus>DEGRADED</eop:imageQualityStatus>
        <eop:imageQualityDegradationTag
codeSpace="urn:eop:SEN1:QualityDegradationTag">PLATFORM_POINTING</eop:imageQualityDegradationTag>
        <eop:processing>
          <eop:ProcessingInformation/>
        </eop:processing>
      </eop:EarthObservationMetaData>
    </eop:metaDataProperty>
  </sar:EarthObservation>
</rep:metadataReport>
```

Example 1 - metadata Report example

4.2 Flow IF-ngEO-MetadataUpdateReport

4.2.1 Applicable standards

Applicable standard to the content of this interface is [XML].

4.2.2 Protocol

This ICD defining only a data model to be exchanged, the protocol used to transfer the file is outside the scope of the present document:

- The protocol used between the Product Facilities and the Feed (interface IF-ngEO-FeedPolling) is defined in [ngEO-EICD-F].
- The protocol used between the Feed and the Catalogue Server (interface IF-ngEO-MetadataIngestion) is defined in [ngEO-EICD-C].

4.2.3 Content

4.2.3.1 Schema

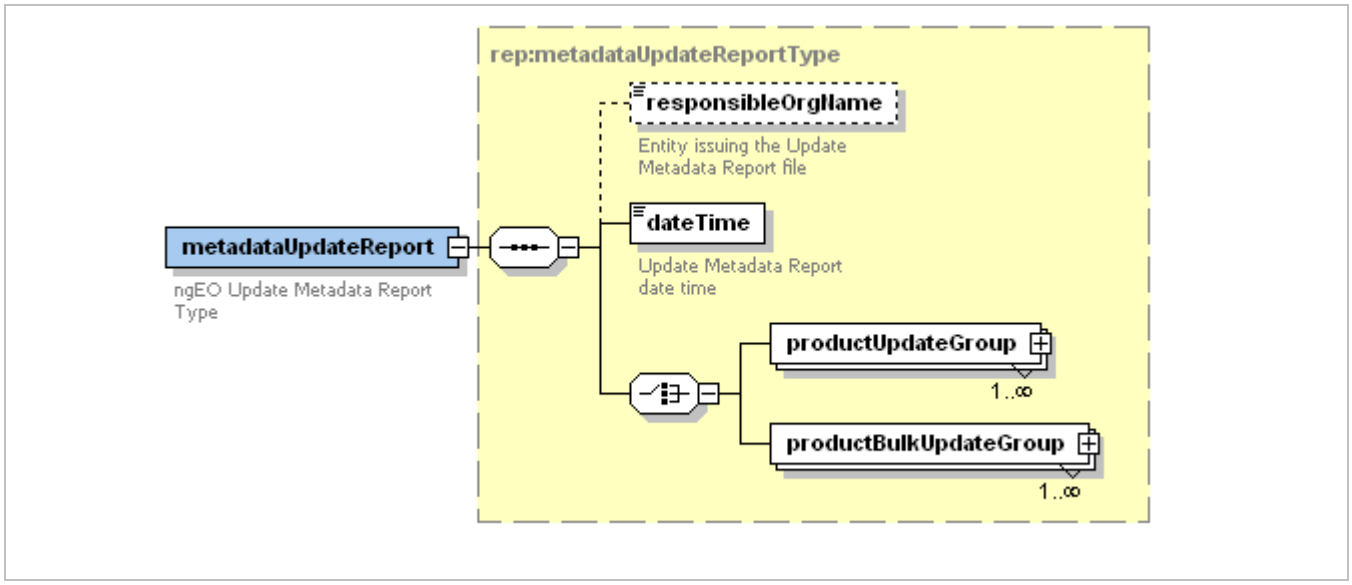

Figure 4 – `rep:metadataUpdateReport` element structure

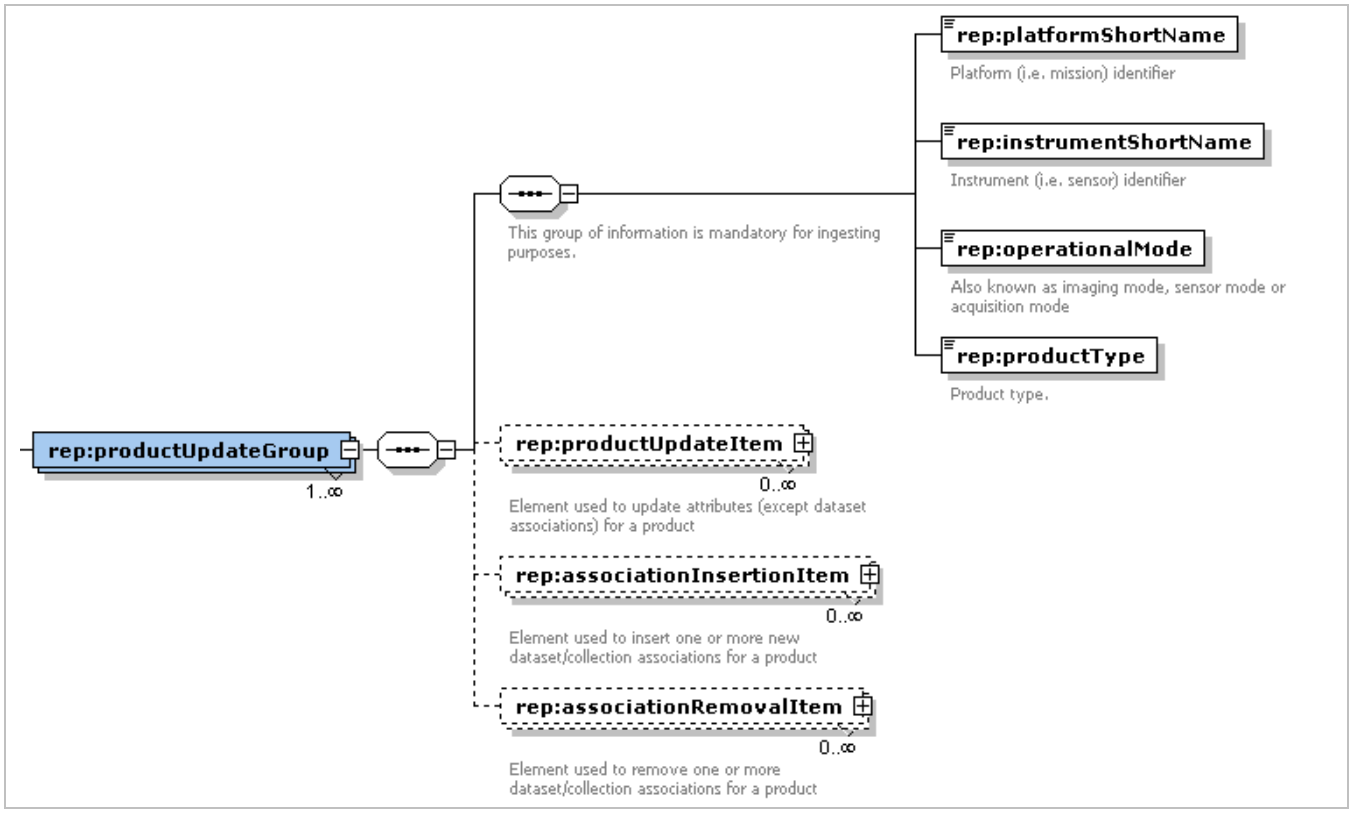

Figure 5 – `rep:productUpdateGroup` element structure

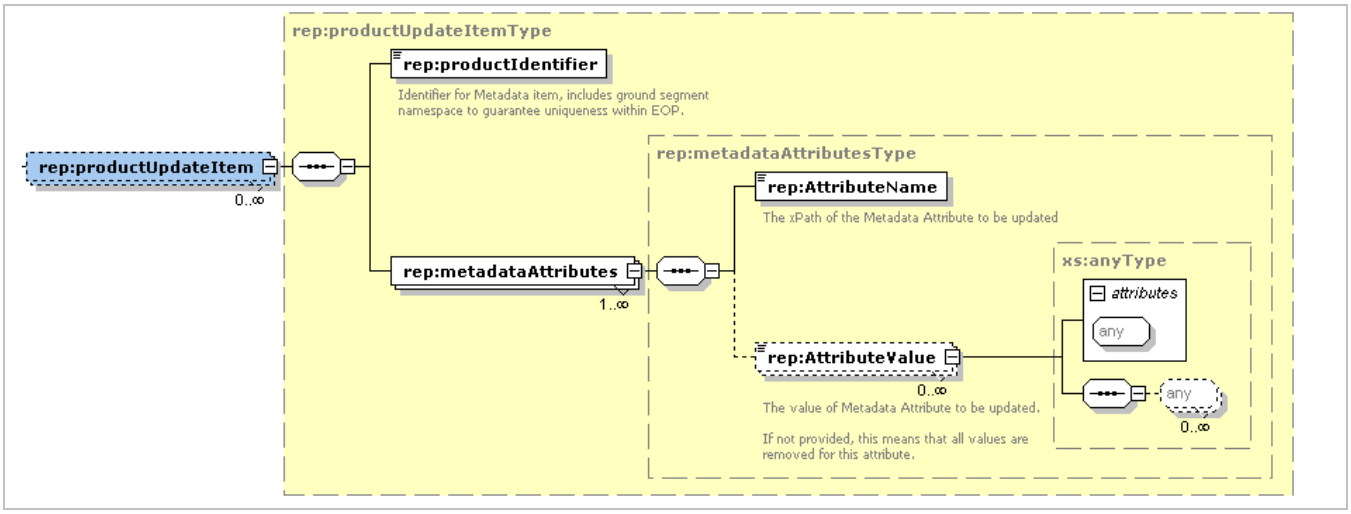

Figure 6 – `rep:productUpdateItem` element structure

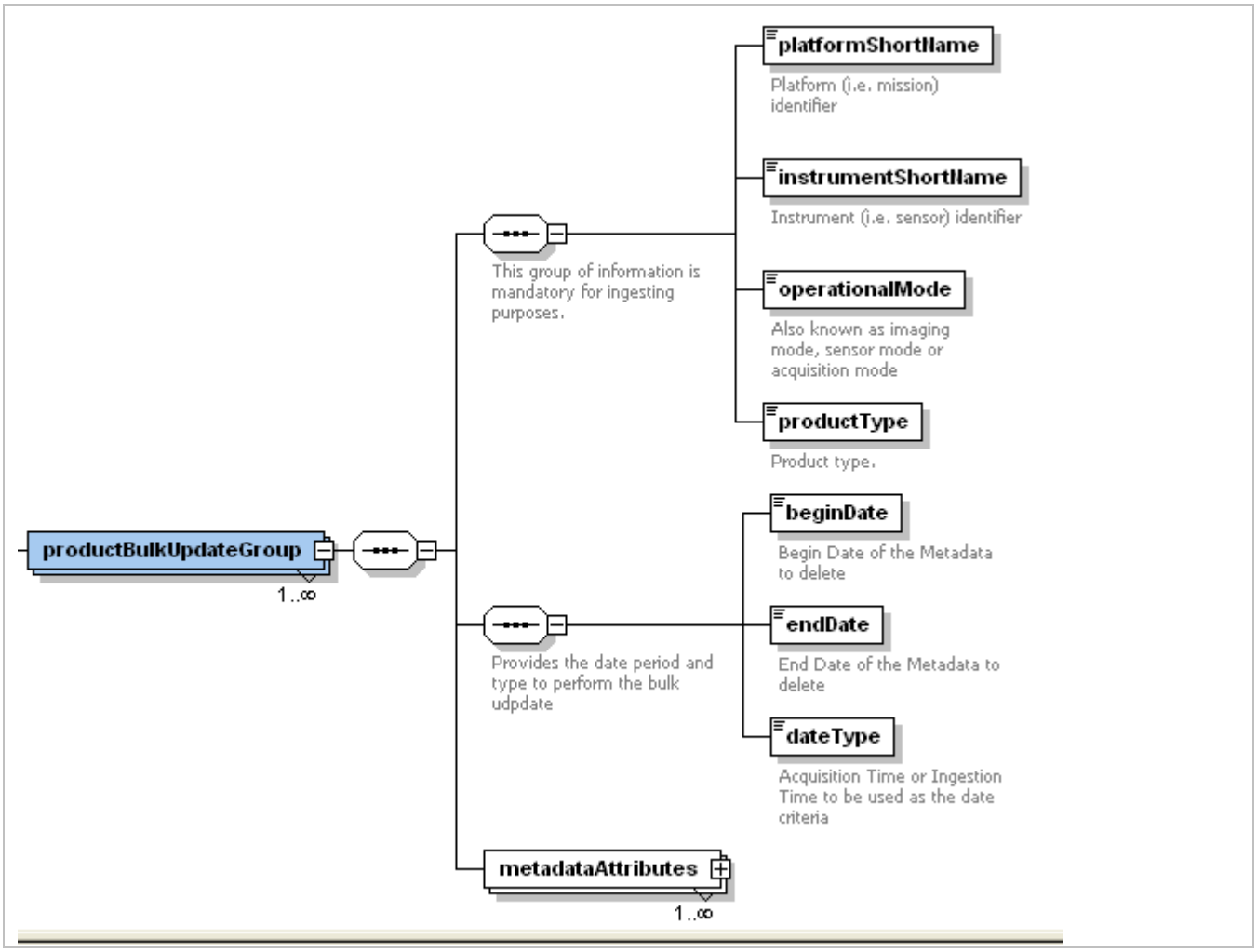

Figure 7 – `rep:productBulkUpdateGroup` element structure

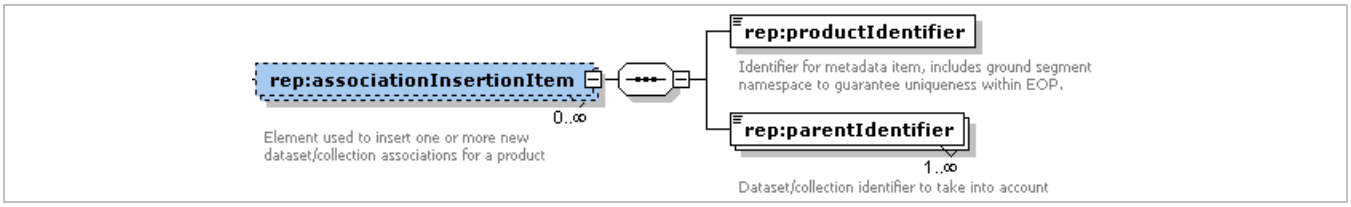

Figure 8 – `rep:associationInsertionItem` element structure

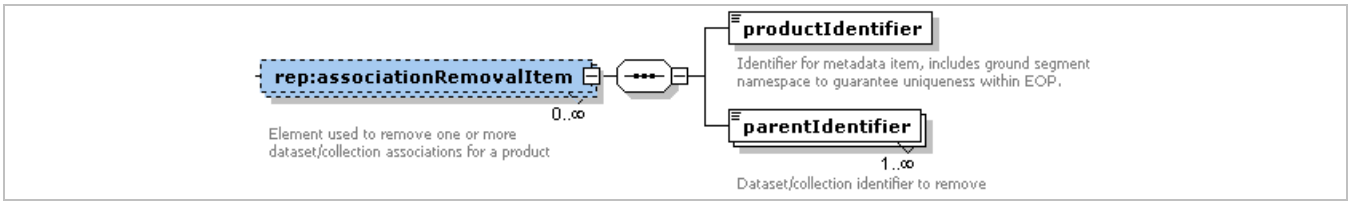

Figure 9 – `rep:associationRemovalItem` element structure

4.2.3.2 Elements

4.2.3.2.1 `rep:metadataUpdateReport` root element

XML element or attribute	Description	Definition
version attribute	version of Metadata Update Report XML Schema	Cardinality: 1 (mandatory) Fixed value: 1.0
rep:responsibleOrgName	Entity issuing the Metadata Update Report file	Type: xs:string Cardinality: 0,1
rep:dateTime	Metadata Update Report date time	Type: xs:dateTime Cardinality: 1 (mandatory)
rep:productUpdateGroup	Array of group of EO Products to be updated	Cardinality: 1 (mandatory),n
rep:productBulkUpdateGroup	Array of BulkUpdate to be performed	Cardinality: 1 (mandatory),n

Table 6 –`rep:metadataUpdateReport` content

4.2.3.2.2 `rep:productUpdateGroup` element

One `rep:productUpdateGroup` element has to be created for every group of updates corresponding to products sharing the same mission/sensor/sensor mode/product type.

XML element or attribute	Description	Definition
rep:platformShortName	Platform (i.e. mission) identifier.	Type: xs:string Cardinality: 1 (mandatory)
rep:instrumentShortName	Instrument (i.e. sensor) identifier	Type: xs:string Cardinality: 1 (mandatory)
rep:operationalMode	Operational mode (Also known as imaging mode, sensor mode or acquisition mode)	Type: xs:string Cardinality: 1 (mandatory)
rep:productType	Product type	Type: xs:string Cardinality: 1 (mandatory)
rep:productUpdateItem	Update of one or more attributes for a product	Cardinality: 0,n
rep:associationInsertionItem	Provides one or more dataset/collection association to add to a product	Cardinality: 0,n
rep:associationRemovalItem	Provides one or more dataset/collection association to remove from a product	Cardinality: 0,n

Table 7 –`rep:productUpdateGroup` content

4.2.3.2.3 `rep:productBulkUpdateGroup` element

One `rep:productBulkUpdateGroup` element is created to update attributes of a list of product from a dataset and between specified ingestion or acquisition dates.

XML element or attribute	Description	Definition
rep:platformShortName	Platform (i.e. mission) identifier.	Type: xs:string Cardinality: 1 (mandatory)
rep:instrumentShortName	Instrument (i.e. sensor) identifier	Type: xs:string Cardinality: 1 (mandatory)
rep:operationalMode	Operational mode (Also known as imaging mode, sensor mode or acquisition mode)	Type: xs:string Cardinality: 1 (mandatory)
rep:productType	Product type	Type: xs:string Cardinality: 1 (mandatory)
rep:beginDate	Begin date of the deletion	Type: xs:dateTime Cardinality: 1 (mandatory)
rep:endDate	End date of the deletion	Type: xs:dateTime Cardinality: 1 (mandatory)
Rep:dateType	To dermine either to consider acquisition or ingestion time as the date criteria Possible values are INGESTION_TIME or ACQUISITION_TIME	Type: xs:string Cardinality: 1 (mandatory)
metadataAttributes	List of attributes to be updated	Cardinality: 1,n

Table 8 –`rep:productBulkUpdateGroup` content

4.2.3.2.4 `rep:productUpdateItem` element

The `rep:productUpdateItem` element is used to provide updates for selected attributes of one product.

The update performed on the product depends of the `rep:attributeValue` element(s):

- one `rep:attributeValue`: the corresponding attribute is removed from the product metadata.
  Trying to remove a mandatory attribute will raise an error.
- one `rep:attributeValue`: the existing values (if any) of the corresponding attribute are removed and replaced by the new value.
- several `rep:attributeValue`: the existing values (if any) of the corresponding attribute are removed and replaced by the new values.
  Trying to set several values to an attribute that doesn't allow it will raise an error.

Note: the association to datasets/collections is not managed through the `rep:productUpdateItem` element. See section 4.2.3.2.6 for adding new dataset/collection and section 4.2.3.2.7 for removing them.

XML element or attribute	Description	Definition
rep:productIdentifier	Product identifier.	Type: xs:string Cardinality: 1 (mandatory)
rep:metadataAttributes/	metadata and value	Type: metadataAttributesType Cardinality: 1 (mandatory)

Table 9 –`rep:productUpdateItem` content

4.2.3.2.5 `rep:metadataAttributes` element

XML element or attribute	Description	Definition
rep:AttributeName	Id of the attribute to update. See 'attribute ID' of tables in section 5 and **Error! Reference source not found.**.	Type: xs:string Cardinality: 1 (mandatory)
rep:AttributeValue	New values for the attribute	Type: xs:string Cardinality: 0, n

Table 10 –`rep:metadataAttributes` content

4.2.3.2.6 `rep:associationInsertionItem` element

The `rep:associationInsertionItem` element is used to add new dataset/collection references for one product.

XML element or attribute	Description	Definition
rep:productIdentifier	Product identifier.	Type: xs:string Cardinality: 1 (mandatory)
rep:parentIdentifier	Identifier of the Product Facility dataset/collection	Type: xs:string Cardinality: 1 (mandatory), n

Table 11 –rep:associationInsertionItem content

4.2.3.2.7 `rep:associationRemovalItem` element

The `rep:associationRemovalItem` element is used to remove dataset/collection references from one product.

XML element or attribute	Description	Definition
rep:productIdentifier	Product identifier.	Type: xs:string Cardinality: 1 (mandatory)
rep:parentIdentifier	Identifier of the Product Facility dataset/collection	Type: xs:string Cardinality: 1 (mandatory), n

Table 12 –rep:associationRemovalItem content

4.2.3.3 Updatable attributes

The table below lists the ids of the product metadata attributes that can be updated through the Metadata Update Report.

Please note that not all product fields are expected to be updated through that mechanism. This is not the case, in particular, of:

- The dataset/collection preferences (i.e. the parentIdentifier attribute) expected to be managed using specific tags. See section 4.2.3.2.6 for adding new dataset/collection and section 4.2.3.2.7 for removing them.
- The product identifier (productId) itself
- Attributes (platformShortName , instrumentShortName, operationalMode, productType) used to compute the ngEO native dataset the product belongs to.
- The status (ARCHIVED / PLANNED) of the product

Some fields are currently marked as TBC. The possibility to update these fields will be confirmed or they will be removed from the table.

Ids of updatable Attributes

Ids of updatable Attributes
beginAcquisition
endAcquisition
availabilityTime
platformSerialIdentifier (TBC)
swathIdentifier (TBC)
orbitNumber
orbitDirection
wrsLongitudeGrid
wrsLatitudeGrid
startTimeFromAscendingNode
completionTimeFromAscendingNode
illuminationAzimuthAngle
illuminationZenithAngle
illuminationElevationAngle
polarisationMode
polarisationChannels
antennaLookDirection
minimumIncidenceAngle
maximumIncidenceAngle
incidenceAngleVariation
dopplerFrequency
multiViewAngles
centreViewAngles
footprint
nominalTrack
occultationPoints
productURI
productVersion
productSize
cloudCoverPercentage
snowCoverPercentage
acquisitionType (TBC)
acquisitionSubType (TBC)
imageQualityDegradation
imageQualityStatus
imageQualityDegradationTag
imageQualityReportURL
productGroupId
add-<additional attribute name>
processingMode

Table 13 –updatable attributes

4.2.3.4 Instantiation

Below is provided an example of update report containing update metadata for two products (note: some ids and values have been simplified for clarity sake):

- An Envisat ASAR Product for which the update provides:
  - A new Product URL that will replace the existing one
  - A new Dataset reference that will be added to the existing list of datasets.

- A SPOT Product for which the update provides:

- New snow coverage percentage and product URL that will replace the existing ones.

```
<?xml version="1.0" encoding="UTF-8"?>
<rep:metadataUpdateReport version="1.1" xmlns:rep="http://ngeo.eo.esa.int/ngEO/report"
xsi:schemaLocation="http://ngeo.eo.esa.int/ngEO/report ../metadataReport/IF-ngEO-MetadataUpdateReport-
1.0.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <rep:dateTime>2011-08-17T09:30:47Z</rep:dateTime>

 <rep:productUpdateGroup>
   <rep:platformShortName>ENVISAT</rep:platformShortName>
   <rep:instrumentShortName>ASAR</rep:instrumentShortName>
   <rep:operationalMode>ASA_IM_</rep:operationalMode>
   <rep:productType>ASA_IM__0P</rep:productType>

   <rep:productUpdateItem>
     <rep:productIdentifier>urn:eop:ESA:ASA_IM__0PNPDE_9525.N1</rep:productIdentifier>
     <rep:metadataAttributes>
       <rep:AttributeName>productURI</rep:AttributeName>
       <rep:AttributeValue>http://ngeo/Envisat/ASA_IM__0P/ASA_IM__0PNPDE_9525.N1</rep:AttributeValue>
     </rep:metadataAttributes>
   </rep:productUpdateItem>

   <rep:associationInsertionItem>
     <rep:productIdentifier>urn:eop:ESA:ASA_IM__0PNPDE_9525.N1</rep:productIdentifier>
     <rep:parentIdentifier>EUROPE-SAR-COL-02</rep:parentIdentifier>
   </rep:associationInsertionItem>
 </rep:productUpdateGroup>

 <rep:productUpdateGroup>
   <rep:platformShortName>SPOT-4</rep:platformShortName>
   <rep:instrumentShortName>HRVIR</rep:instrumentShortName>
   <rep:operationalMode>HIR_I__</rep:operationalMode>
   <rep:productType>HIR_I__0X</rep:productType>

   <rep:productUpdateItem>
     <rep:productIdentifier>urn:eop:SPOT:Mul20mI1A2:2234298930312045056 2X</rep:productIdentifier>
     <rep:metadataAttributes>
       <rep:AttributeName>productURI</rep:AttributeName>
       <rep:AttributeValue>http://ngeo/SPOT/Mul20mI1A2_2234298930312045056 2X</rep:AttributeValue>
     </rep:metadataAttributes>
     <rep:metadataAttributes>
       <rep:AttributeName>snowCoverPercentage</rep:AttributeName>
       <rep:AttributeValue>25</rep:AttributeValue>
     </rep:metadataAttributes>
   </rep:productUpdateItem>
 </rep:productUpdateGroup>
</rep:metadataUpdateReport>
```

Example 2 - metadata Update Report example

Below is provided an example of bulk update report

```
<?xml version="1.0" encoding="UTF-8"?>
<rep:metadataUpdateReport version="1.1" xmlns:rep="http://ngeo.eo.esa.int/ngEO/report"
xsi:schemaLocation="http://ngeo.eo.esa.int/ngEO/report ../metadataReport/IF-ngEO-MetadataUpdateReport-
1.0.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <rep:dateTime>2011-08-17T09:30:47Z</rep:dateTime>

 <rep:productBulkUpdateGroup>
   <rep:platformShortName>ENVISAT</rep:platformShortName>
   <rep:instrumentShortName>ASAR</rep:instrumentShortName>
   <rep:operationalMode>ASA_IM_</rep:operationalMode>
   <rep:productType>ASA_IM__0P</rep:productType>
   <rep:beginDate>2001-08-22T11:02:47.999</rep:beginDate>
   <rep:endDate>2006-08-22T11:02:47.999</rep:endDate>
   <rep:dateType>ACQUISITION_TIME</rep:dateType>
     <rep:metadataAttributes>
       <rep:AttributeName>processingLevel</rep:AttributeName>
       <rep:AttributeValue>3</rep:AttributeValue>
```

```
    </rep:metadataAttributes>
</rep:productBulkUpdateGroup>
</rep:metadataUpdateReport>
```

Example 3 - metadata Update Report example

4.3 Flow IF-ngEO-MetadataDeleteReport

4.3.1 Applicable standards

Applicable standard to the content of this interface is [XML].

4.3.2 Protocol

This ICD defining only a data model to be exchanged, the protocol used to transfer the file is outside the scope of the present document:

- The protocol used between the Product Facilities and the Feed (interface IF-ngEO-FeedPolling) is defined in [ngEO-EICD-F].
- The protocol used between the Feed and the Catalogue Server (interface IF-ngEO-MetadataIngestion) is defined in [ngEO-EICD-C].

4.3.3 Content

4.3.3.1 Schema

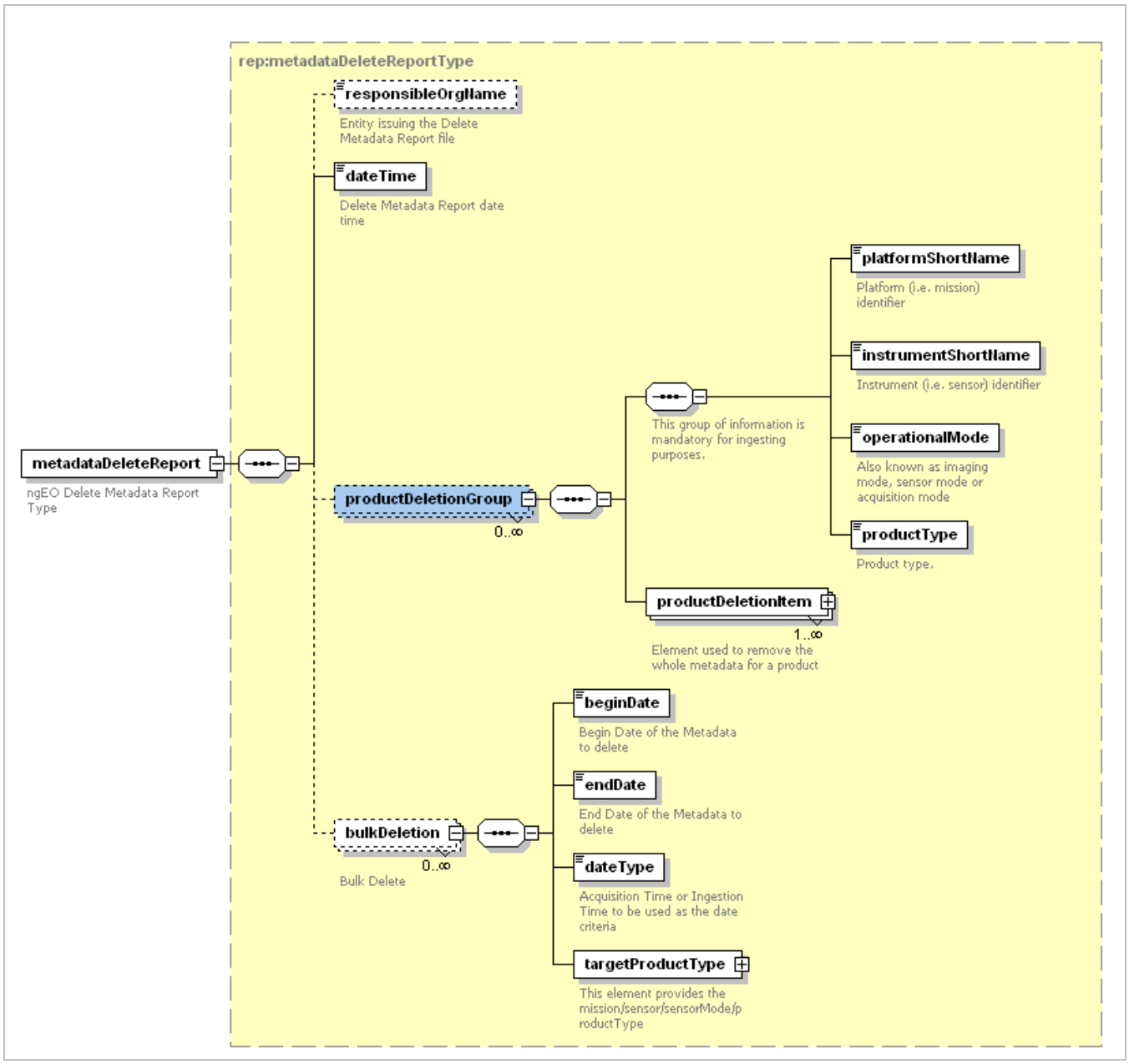

Figure 10 – `rep:metadataDeleteReport` element structure

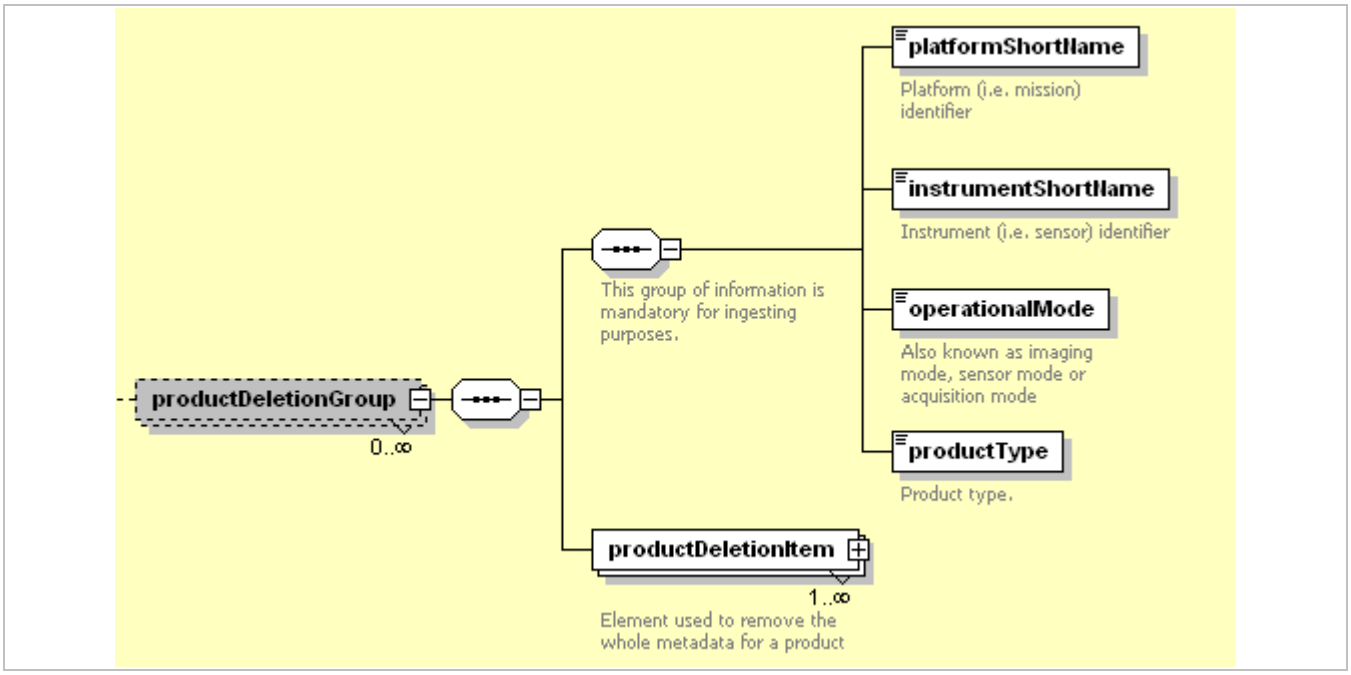

Figure 11 – `rep:productDeletionGroup` element structure

4.3.3.2 Elements

4.3.3.2.1 `rep:metadataDeleteReport` root element

XML element or attribute	Description	Definition
Version attribute	version of Metadata Delete Report XML Schema	Cardinality: 1 (mandatory) Fixed value: 1.0
rep:responsibleOrgName	Entity issuing the Metadata Delete Report file	Type: xs:string Cardinality: 0,1
rep:dateTime	Metadata Delete Report date time	Type: xs:dateTime Cardinality: 1 (mandatory)
rep:productDeletionGroup	Array of group of EO Products to be deleted	Cardinality: 0,n
rep:bulkDeletion	Array of bulk delete Element	Cardinality: 0,n

Table 14 –`rep:metadataDeleteReport` content

4.3.3.2.2 `rep:productDeletionGroup` element

One rep:productDeletionGroup element has to be created for every group of deletion orders corresponding to products sharing the same mission/sensor/sensor mode/product type.

XML element or attribute	Description	Definition
rep:platformShortName	Platform (i.e. mission) identifier.	Type: xs:string Cardinality: 1 (mandatory)
rep:instrumentShortName	Instrument (i.e. sensor) identifier	Type: xs:string Cardinality: 1 (mandatory)
rep:operationalMode	Operational mode (Also known as imaging mode, sensor mode or acquisition mode)	Type: xs:string Cardinality: 1 (mandatory)
rep:productType	Product type	Type: xs:string Cardinality: 1 (mandatory)
rep:productDeletionItem	Provides identifier of product to be deleted	Cardinality: 1,n

Table 15 –rep:productDeletionGroup content

4.3.3.2.3 rep:productDeletionItem element

The rep:productDeletionItem element is used to request the removal of all metadata for a product from the ngEO Catalogue.

XML element or attribute	Description	Definition
rep:productIdentifier	Product identifier.	Type: xs:string Cardinality: 1 (mandatory)

Table 16 –rep:productDeletionItem content

4.3.3.2.4 rep:bulkDeletion element

The rep:bulkDeletion element is used to request deletion of a subset of a dataset with acquisitionDate or ingestionDate between a start and an end Date.

XML element or attribute	Description	Definition
rep:beginDate	Begin date of the deletion	Type: xs:dateTime Cardinality: 1 (mandatory)
rep:endDate	End date of the deletion	Type: xs:dateTime Cardinality: 1 (mandatory)
Rep:dateType	To dermine either to consider acquisition or ingestion time as the date criteria Possible values are INGESTION_TIME or ACQUISITION_TIME	Type: xs:string Cardinality: 1 (mandatory)
rep:targetProductType	Explicit definition of the mission/sensor/sensor mode/product type to be delete	Cardinality: 1 (mandatory)
rep:targetProductType/ rep:platformShortName	Platform (i.e. mission) identifier	Type: xs:string Cardinality: 1 (mandatory)
rep:targetProductType/ rep:instrumentShortName	Instrument (i.e. sensor) identifier	Type: xs:string Cardinality: 1 (mandatory)
rep:targetProductType/ rep:operationalMode	Operational mode (also known as imaging mode, sensor mode or acquisition mode)	Type: xs:string Cardinality: 1 (mandatory)
rep:targetProductType/ rep:productType	Product Type	Type: xs:string Cardinality: 1 (mandatory)

4.3.3.3 Instantiation

Below is provided an example of delete report requestion the deletion of two product metadata belonging to the same mission/sensor/sensor mode/product type (note: some ids and values have been simplified for clarity sake):

```
<?xml version="1.0" encoding="UTF-8"?>
<rep:metadataDeleteReport version="1.0" xmlns:rep="http://ngeo.eo.esa.int/ngEO/report"
xsi:schemaLocation="http://ngeo.eo.esa.int/ngEO/report ../metadataReport/IF-ngEO-MetadataDeleteReport-
1.0.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <rep:responsibleOrgName>ESA</rep:responsibleOrgName>
 <rep:dateTime>2001-12-17T09:30:47Z</rep:dateTime>
 <rep:productDeletionGroup>
   <rep:platformShortName>ENVISAT</rep:platformShortName>
   <rep:instrumentShortName>ASAR</rep:instrumentShortName>
   <rep:operationalMode>ASA_IM_</rep:operationalMode>
   <rep:productType>ASA_IM__0P</rep:productType>
   <rep:productDeletionItem>
     <rep:productIdentifier>urn:eop:ESA:ASA_IM__0PNPDE_9525.N1</rep:productIdentifier>
   </rep:productDeletionItem>
   <rep:productDeletionItem>
     <rep:productIdentifier>urn:eop:ESA:ASA_IM__0PNPDE_9526.N1</rep:productIdentifier>
   </rep:productDeletionItem>
 </rep:productDeletionGroup>
</rep:metadataDeleteReport>
```

Example 4 - metadata Delete Report example

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<rep:metadataDeleteReport version="1.0" xmlns:rep="http://ngeo.eo.esa.int/ngEO/report"
xsi:schemaLocation="http://ngeo.eo.esa.int/ngEO/report ../metadataReport/IF-ngEO-MetadataDeleteReport-
1.0.xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <rep:responsibleOrgName>ESA</rep:responsibleOrgName>
 <rep:dateTime>2001-12-17T09:30:47Z</rep:dateTime>
 <rep:bulkDeletion>
  <rep:targetProductType>
   <rep:platformShortName>ENVISAT</rep:platformShortName>
   <rep:instrumentShortName>ASAR</rep:instrumentShortName>
   <rep:operationalMode>ASA_IM_</rep:operationalMode>
   <rep:productType>ASA_IM__0P</rep:productType>
  </rep:targetProductType>
  <rep:beginDate>2001-08-22T11:02:47.999</rep:beginDate>
  <rep:endDate>2006-08-22T11:02:47.999</rep:endDate>
  <rep:dateType>ACQUISITION_TIME</rep:dateType>
</rep:bulkDeletion>
</rep:metadataDeleteReport>
```

Example 5 - metadata BulkDelete Report example

5 The ngEO tailoring of Earth Observation Product model

The model for product metadata embedded in the Metadata Report (see section 4.1) is a customization of the model for Earth Observation products defined in [OGC 10-157].

[OGC 10-157] is, at time of this writing, under a revision process at OGC, the organization in charge of this specification. **Several elements required by ngEO have been proposed to OGC in the frame of this revision process**. This ICD assumes that these elements will be adopted in the core vocabulary (i.e. the 'eop' layer) of the [OGC 10-157]. These elements are:

- `eop:imageQualityStatus`
- `eop:imageQualityDegradationTag`
- `eop:imageQualityReportURL`
- `eop:productGroupId`

The following subsections define the subset of Earth Observation products attributes that are taken into account in the ngEO subsystem. **All the attributes that are not expected by ngEO are declared as 'ignored' and are represented in gray in the following tables**.

Please note EO Product model is based on several underlying XML structures taken from O&M and GML standard vocabularies. Some attributes are made mandatory by these inherited structures and, as such, must be present in an EO Product for XML validity sake even if they are ignored by ngEO.

5.1 General EO Product schema tailoring

The 'eop' schema provides the description of metadata common to all Earth Observation Products.

5.1.1 `eop:EarthObservation` element

The eop:EarthObservation element is the base of every Earth Observation Product.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**gml:id attribute**	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	**String**	**1**	**Ignored**	**1**	The convention to use the Product ID plus a suffix in order to have the ID unique inside the document. This id is not to be used to retrieve the product ID. There-s no need to store this attribute inside the catalogue database	<pdt_id>_<counter>
N/A	**gml:metaDataProperty** **gml:description** **gml:descriptionReference** **gml:identifier** **gml:name** **gml:boundedBy** **gml:location** **om:type** **om:metadata** **om:relatedObservation**	Various optional properties defined in the GML feature and in the O&M Observation models	**Complex**	**0..n**	**Ignored**	**Ignored**		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
beginAcquisition	**om:phenomenonTime/ gml:TimePeriod/ gml:beginPosition**	Acquisition start date time dateTime in ISO 8601 format (CCYY-MM-DDThh:mm[:ss[.cc]]Z)	**dateTime**	**1**	**1**	**1**	For EO product this is the sensing time	2001-08-22T11:02:47.00Z
endAcquisition	**om:phenomenonTime/ gml:TimePeriod/ gml:endPosition**	Acquisition end date time dateTime in ISO 8601 format (CCYY-MM-DDThh:mm[:ss[.cc]]Z)	**dateTime**	**1**	**1**	**1**	Maybe equal to the start for zero length products	2001-08-22T11:02:47.99Z
availabilityTime	**om:resultTime/ gml:TimeInstant/ gml:timePosition**	The time when the result becomes available dateTime in ISO 8601 format (CCYY-MM-DDThh:mm[:ss[.cc]]Z)	**dateTime**	**1**	**1**	**1**	The Result Time has to be set either to the availability time (e.g. when the product is available on-line or the procesing time) if this is achievable or to the acquisition stop time	2001-08-22T11:02:47.99Z
N/A	**om:validTime**	the time period during which the result is intended to be used (e.g. if a meteorological forecast is modelled as an observation, then it is intended to be used during a specific period of time)	**gml:TimePeriodPropertyType**	**0..1**	**Ignored**	**Ignored**		
N/A	***om:procedure/ eop:EarthObservationEquipment***	*General properties such as the data identifier, the downlink and archiving information.*	**eop:EarthObservationEquipmentType**	***1***	***1***	***1***		
N/A	**om:parameter**	Arbitrary event-specific parameter	**om:NamedValuePropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	**om:observedProperty**	An xlink to the observed property definition	**Complex**	**1..n**	**Ignored**	**1**	Report should use nilReason="inapplicable"	nilReason="inapplicable"

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	***om:featureOfInterest/ eop:Footprint***	*The observed area (or its projection) on the ground i.e. the footprint of acquisition*	**eop:FootprintType**	***0..n***	***0..1***	***0..n***	*Not used for global products / not geolocated products. if more than one footprint is provided in metadata reports, ngEO only considers the first one. For search results, cardinality n is only used for S2 products where a footprint is provided for each granules contained in the product*	
N/A	**om:resultQuality**	Information concerning the quality of a result	**gmd:DQ_Element_PropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	***om:result/ eop:EarthObservationResult***	*Earth Observation result metadata composed of the browse, mask and product description*	**eop:EarthObservation ResultType**	***0..1***	***0..1***	***0..1***	*mandatory for acquired products 0 (ignored) for planned products*	
N/A	***eop:metaDataProperty/ eop:EarthObservationMetaData***	*Additional external metadata about the data acquisition.*	**eop:EarthObservation MetaDataType**	***1***	***1***	***1***		

5.1.2 `eop:EarthObservationEquipment` element

The `eop:EarthObservationEquipment` element contains metadata relative to the mechanism used during the EarthObservation.

These metadata describe on one hand the platform, instrument and sensor used for the Earthobservation, and, on the other hand, the acquisition parameters of this observation.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**gml:id attribute**	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	**String**	**1**	**Ignored**	**1**	The convention to use the Product ID plus a suffix in order to have the ID unique inside the document. This id is not to be used to retrieve the product ID. There-s no need to store this attribute inside the catalogue database	<pdt_id>_<counter>
N/A	**gml:metaDataProperty** **gml:description** **gml:descriptionReference** **gml:identifier** **gml:name** **gml:boundedBy** **gml:location**	Various optional properties defined in the GML underlying model	**Complex**	**0..n**	**Ignored**	**Ignored**		
N/A	**eop:platform/** **eop:Platform**	Information about the platform	**eop:PlatformPropertyType**	**0..1**	**1**	**1**		
platformShortName	**eop:platform/** **eop:Platform/** **eop:shortName**	Platform short name (e.g. Sentinel-1)	**String**	**1**	**1**	**1**		Sentinel-1
platformSerialIdentifier	**eop:platform/** **eop:Platform/** **eop:serialIdentifier**	Platform serial identifier	**String**	**0..1**	**0..1**	**0..1**		A (in case of Sentinel-1 platform)
N/A	**eop:platform/** **eop:Platform/** **eop:orbitType**	High level characterisation of main mission types (GEO/LEO)	**eop:OrbitTypeValueType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:instrument/** **eop:Instrument**		**eop:InstrumentPropertyType**	**0..1**	**1**	**1**		
instrumentShortName	**eop:instrument/** **eop:Instrument/** **eop:shortName**	Instrument (Sensor) name	**String**	**0..1**	**1**	**1**	It's Mandatory for ngEO for the Native Dataset configurations. For Synergic products this is the code of the Virtual sensor that represent the combination of different sensors used (i.e. SYN_...)	SAR

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**eop:instrument/ eop:Instrument/ eop:description**	Instrument description	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:instrument/ eop:Instrument/ eop:instrumentType**	Instrument type	**String**	**0..1**	**Ignored**	**Ignored**		
sensorType	**eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor type. This field should contain an enumeration : - OPTICAL - RADAR - ALTIMETRIC - ATMOSPHERIC - LIMB	**eop:SensorTypeValueType**	**0..1**	**0..1**	**0..1**	This value is mandatory if a thematic layer schema is used, and its value should match the schema (i.e. use "OPTICAL" when the opt schema is used).	OPTICAL
operationalMode	**eop:sensor/ eop:Sensor/ eop:operationalMode**	Sensor mode. Possible values are mission specific and should be retrieved using codeSpace.	**gml:CodeListType**	**0..1**	**1**	**1**	It's Mandatory for ngEO for the Native Dataset configurations. If not provided ngEO uses a default internal value (e.g. NIL)	IM
N/A	**eop:sensor/ eop:Sensor/ eop:resolution**	Image resolution	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
swathIdentifier	**eop:sensor/ eop:Sensor/ eop:swathIdentifier**	Swath identifier (e.g. Envisat ASAR has 7 distinct swaths (I1,I2,I3...I7) that correspond to precise incidence angles for the sensor). Value list can be retrieved with codeSpace.	**gml:CodeListType**	**0..1**	**0..1**	**0..1**		I2
N/A	**eop:sensor/ eop:Sensor/ eop:wavelengthInformation**	Information about the spectral bands	**eop:WavelengthInformationPropertyType**	**0..1**	**Ignored**	**Ignored**		
N/A	***eop:acquisitionParameters/ eop:Acquisition***	*Acquisition parameters*	**eop:AcquisitionPropertyType**	***0..1***	***0..1***	***0..1***		

5.1.3 `eop:Acquisition` element

The `eop:Acquisition` element provides the acquisition parameters of the observation.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
orbitNumber	**eop:orbitNumber**	Acquisition orbit number	**integer**	**0..1**	**0..1**	**0..1**		16690
N/A	**eop:lastOrbitNumber**	Acquisition last orbit number	**integer**	**0..1**	**Ignored**	**Ignored**		
orbitDirection	**eop:orbitDirection**	Acquisition orbit direction (Ascending or descending)	**eop:OrbitDirectionValueType**	**0..1**	**0..1**	**0..1**		
wrsLongitudeGrid	**eop:wrsLongitudeGrid**	Neutral wrsLongitudeGrid to replace track in track/frame, K in K/J, etc. The optional attribute "eop:codeSpace" is used to point the reference grid	**gml:CodeWithAuthorityType**	**0..1**	**0..1**	**0..1**		360
wrsLatitudeGrid	**eop:wrsLatitudeGrid**	Neutral wrsLatitudeGrid to replace frame in track/frame, J in K/J, etc. The optional attribute "eop:codeSpace" is used to point the reference grid	**gml:CodeWithAuthorityType**	**0..1**	**0..1**	**0..1**		24
N/A	**eop:ascendingNodeDate**	UTC date and time at ascending node of orbit	**dateTime**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:ascendingNodeLongitude**	Longitude at ascending node of orbit. should be expressed in degrees.	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
startTimeFromAscendingNode	**eop:startTimeFromAscendingNode**	Start time of acquisition in milliseconds from Ascending node date.	**gml:MeasureType**	**0..1**	**0..1**	**0..1**	Mandatory for products subject to inteferometric searches	
completionTimeFromAscendingNode	**eop:completionTimeFromAscendingNode**	Completion time of acquisition in milliseconds from Ascending node date.	**gml:MeasureType**	**0..1**	**0..1**	**0..1**	Mandatory for products subject to inteferometric searches	
N/A	**eop:orbitDuration**	Actual orbit duration in milliseconds.	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
illuminationAzimuthAngle	**eop:illuminationAzimuthAngle**	Mean illumination/solar azimuth angle given in degrees. (i.e. uom='deg')	**gml:AngleType**	**0..1**	**0..1**	**0..1**		
illuminationZenithAngle	**eop:illuminationZenithAngle**	Mean illumination/solar zenith angle given in degrees.	**gml:AngleType**	**0..1**	**0..1**	**0..1**		
illuminationElevationAngle	**eop:illuminationElevationAngle**	Mean illumination/solar elevation angle given in degrees. (i.e. uom='deg')	**gml:AngleType**	**0..1**	**0..1**	**0..1**		
N/A	**eop:incidanceAngle**	Acquisition global incidence angle given in degrees (i.e. uom='deg')	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:acrossTrackIncidenceAngle**	Acquisition across track Incidence angle given in degrees. (i.e. uom='deg')	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:alongTrackIncidenceAngle**	Acquisition along track incidence angle given in degrees. (i.e. uom='deg')	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:instrumentAzimuthAngle**	Mean instrument azimuth angle given in degrees. (i.e. uom='deg')	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:instrumentZenithAngle**	Mean instrument zenith angle given in degrees. (i.e. uom='deg')	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:instrumentElevationAngle**	Mean instrument elevation angle given in degrees.	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:pitch**	Pitch angle given in degrees.	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:roll**	Roll angle given in degrees.	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:yaw**	Yaw angle given in degrees.	**gml:AngleType**	**0..1**	**Ignored**	**Ignored**		

5.1.4 `eop:Footprint` element

The `eop:Footprint` element contains description of the target location observed during the EarthObservation.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**gml:id attribute**	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	**String**	**1**	**Ignored**	**1**	The convention to use the Product ID plus a suffix in order to have the ID unique inside the document. This id is not to be used to retrieve the product ID. There-s no need to store this attribute inside the catalogue database	<product_id>_<counter>
footprint	**eop:multiExtentOf**	Acquisition footprint coordinates, described by a closed polygon (last point=first point), using CRS:WGS84, Latitude,Longitude pairs (per-WGS84 definition of point ordering, not necessarily per all WFS implementations). Expected structure is: gml:Polygon/gml:exterior/gml:LinearRing/gml:posList The Polygon geometry shall be encoded in the EPSG:4326 geographic coordinate reference system and the coordinate pairs shall be ordered as lat / lon.	**gml:MultiSurfacePropertyType**	**1**	**1**	**1**	Polygons are provide CCW . TBD with OGC if this should be optional when LIMB or ALT schema are used. Proposal is to allow a choice (at eop generic level)e between an attribute of type gml:MultiCurvePropertyType or gml:MultiPointPropertyType or gml:Polygon, and to tailor this choice in the thematic layers.	
N/A	**eop:centerOf**	Acquisition center coordinates	**gml:PointPropertyType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:orientation**	Determines the orientation of the coordinate pairs for the exterior boundary of the footprint polygons. Possible values are CW (clockwise), counter-clockwise (CCW) or OTHER (unspecified orientation). Note that this property is only to be provided for footprints that do not follow the normal counterclockwise for exterior boundaries convention as defined in [OGC06-103r4]	**eop:PolygonOrientationValueType**	**0..1**	**Ignored**	**Ignored**		

5.1.5 `eop:EarthObservationResult` element

The `eop:EarthObservationResult` element contains the description of the result of the EarthObservation.

This element has been originally designed to provide the possibility to specify several results (among them products, browses and masks) but ngEO tailoring restricts this content to product information only:

- browses are processed independently from the product metadata through specific Browse Reports (see [ngEO-BRGICD])
- masks are treated as specific types of browses.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**gml:id attribute**	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	**String**	**1**	**Ignored**	**1**	The convention to use the Product ID plus a suffix in order to have the ID unique inside the document. This id is not to be used to retrieve the product ID. There-s no need to store this attribute inside the catalogue database	<product_id>_<counter>
N/A	**gml:metaDataProperty** **gml:description** **gml:descriptionReference** **gml:identifier** **gml:name** **gml:boundedBy** **gml:location**	Various optional properties defined in the GML underlying model	**Complex**	**0..n**	**Ignored**	**Ignored**		
N/A	**eop:browse**		**eop:BrowseInformationPropertyType**	**0..n**	**Ignored**	**Ignored**	Browses are processed through specific Browse Reports	

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	***eop:product/ eop:ProductInformation***	*Information about the Product*	**Complex**	***0..n***	***0..1***	***0..1***	*Mandatory only in case of ARCHIVED products*	
N/A	**eop:mask**	Information about masks	**eop:MaskInformationPropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	**eop:parameter**	Parameter information about any measured parameters	**eop:ParameterInformationPropertyType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:coverage**	Reference to coverage exploitation metadata as offered by a corresponding WCS using a HTTP GET encoded DescribeCoverage Request	**gml:ReferenceType**	**0..n**	**Ignored**	**Ignored**		

5.1.6 `eop:ProductInformation` element

The `eop:ProductInformation` element contains the description of the product, i.e.:

- The product URI used by a client to locate and download the product
- The product size (or an estimation for products generated on the fly)

The product URI shall contain a pattern allowing the identification of mission/sensor mode/product type. URL convention, if any, will be specified in the tailored ICDs for each facility, in line with the ngEO above conventions

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
productURI	**eop:filename/ ows:ServiceReference/ @xlink:href**	The Product HTTP URI	**anyURI**	**1**	**1**	**1**	ngEO does not impose a URL convention in the generic ICD. ngEO imposes only that the URL contains a pattern allowing the identification of mission/sensor/mode/product type. URL convention, if any, will be specified in the tailored ICDs for each facility, in line with the ngEO above conventions	
N/A	**referenceSystemIdentifier**	Indicates if product is geo-referenced, (in which case should point to a code space for the CRS), when not supplied it is assumed that the browse is provided in "raw" satellite frame of reference	**gml:CodeWithAuthorityType**	**0..1**	**Ignored**	**Ignored**		
productVersion	**eop:version**	Product version	**String**	**0..1**	**0..1**	**0..1**	Used for Processing Baseline	"A", "v1.2", "Baseline 3"
productSize	**eop:size**	Product size (bytes) allowing the user to realise how long a download is likely to take If product size is not known, an estimation shall be provided rounding the average estimated size to the 2 most significant digits	**gml:MeasureListType**	**0..1**	**1**	**1**	Product Facility must at least provide an estimation of the size if not the real one	

5.1.7 `eop:EarthObservationMetaData` element

The `eop:EarthObservationMetaData` element contains all the metadata relative to an eop:EarthObservation that do not fit inside one of the other blocks, i.e. metadata that don't describe the time, the mechanism, the location or the result of the observation.

These metadata are mainly the EO Product identifier, the acquisition type and information relative to the downlink and archiving centers.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
productId	**eop:identifier**	Identifier for metadata item, includes ground segment namespace to guarantee uniqueness within EOP.	**String**	**1**	**1**	**1**	ngEO does not rely on any naming convention. It requires only uniqueness of the name within a mission	urn:eop:ESA:GOM_EXT_2P:OM_EXT_2PNPDE20080203_194540_000000412065_00386_31001_6170.N1
N/A	**eop:creationDate**	metadata field for the creation/modification date of the catalogue entry		**0..1**	**Ignored**	**Ignored**		
N/A	**eop:doi**	Digital Object Identifier identifying the product	**String**	**0..1**	**Ignored**	**Ignored**		
parentIdentifier	**eop:parentIdentifier**	Product Facility Dataset / collection Identifier (e.g. for CDS: the DataSet identifier or Sub DataSet Identifier). If the product is associated to various identifiers, the other identifiers have to be provided through Metadata Update Reports.	**String**	**0..1**	**0..1**	**0..1**		
acquisitionType	**eop:acquisitionType**	Used to distinguish at a high level the appropriateness of the acquisition for "general" use, whether the product is a nominal acquisition, special calibration product or other. Values: - NOMINAL - CALIBRATION - OTHER	**String**	**1**	**1**	**1**		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
acquisitionSubType	**eop:acquisitionSubType**	Acquisition sub-type	**String**	**0..1**	**0..1**	**0..1**	This should be used by Sentinel-2	
productType	**eop:productType**	Describes product type in case that mixed types are available within a single collection, this is ground segment specific definition.	**String**	**0..1**	**1**	**1**		SAR_SM
status	**eop:status**	Refers to product status. Values : - **ARCHIVED** - **ACQUIRED** - **CANCELLED** - FAILED - **PLANNED** - POTENTIAL - REJECTED	**String**	**1**	**1**	**1**	It shall contain either the value "ARCHIVED" in case of Archiving Report type or "PLANNED" in case of Planned report type. In the case of CDS, ACQUIRED and CANCELLED values are also accepted	
N/A	**eop:statusDetail**	Related to eop:status: provides the reason of a failure deletion or rejection	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:downlinkedTo/ eop:DownlinkInformation**		**eop:DownlinkInformationType**	**0..n**	**Ignored**	**Ignored**		
N/A	**eop:archivedIn/ eop:ArchivingInformation**		**eop:ArchivingInformationType**	**0..n**	**Ignored**	**Ignored**		
imageQualityDegradation	**eop:imageQualityDegradation**	Quality degradation percentage (i.e. uom='%')	**gml:MeasureType**	**0..1**	**0..1**	**0..1**	Could be used for the Missing Line information	10
N/A	**eop: imageQualityDegradation QuotationMode**	Indicator to know how the quality degradation percentage has been calculated	**eop: DegradationQuotation ModeValueType**	**0..1**	**Ignored**	**Ignored**		
imageQualityStatus	**eop:imageQualityStatus**	This optional field must be provided if the product passed a quality check. Values : - NOMINAL - DEGRADED	**String**	**N/A**	**0..1**	**0..1**		It is assumed that this candidate field has been accepted in the eop vocabulary.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
imageQualityDegradationTag	**eop:imageQualityDegradationTag**	Keywords giving information on the degradations affecting the product. Possible vlaues are mission specific and can be freely define (e.g. "RADIOMETRY", "MISSING_LINES", ...) This optional field must be provided if eop:imageQualityStatus value is DEGRADED	**gml:CodeListType**	**N/A**	**0..n**	**0..n**		It is assumed that this candidate field has been accepted in the eop vocabulary.
imageQualityReportURL	**eop:imageQualityReportURL**	URL of an external detailed quality report	**anyURI**	**N/A**	**0..1**	**0..1**		It is assumed that this candidate field has been accepted in the eop vocabulary.
N/A	**eop:histograms**	Histograms	**eop:HistogramPropertyType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:composedOf**	Link to an EO product that is part of this EO product	**eop:EarthObservationPropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	**eop:subsetOf**	Link to the "father" EO product	**eop:EarthObservationPropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	**eop:linkedWith**	Link to another EO product	**eop:EarthObservationPropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	***eop:processing/ eop:ProcessingInformation***	*Processing information*	**eop:ProcessingInformationType**	***0..1***	***0..1***	***0..1***		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
productGroupId	**eop:productGroupId**	Identifier of a particular group to which the product belongs to. Group members represent then "granules" or "portions" of end-user products that are eligible for specific aggregations (e.g. all Sentinel-2 granules having the same productGroupId can be assembled together to form a Sentinel-2 end-user product)	**String**	**N/A**	**0..1**	**0..1**		It is assumed that this candidate field has been accepted in the eop vocabulary.
add-<additional attribute name>	**eop:vendorSpecific/ eop:SpecificInformation/ eop:localAttribute**	Additional attribute name	**String**	**0..n**	**0..n**	**0..n**		This pair of localAttribute/localValue elements can be used to provide, additional attributes in the product metadata without changing the model. In order to be taken into account and possibly searched, these additional attributes will have to be declared in ngEO configuration.
See previous row	**eop:vendorSpecific/ eop:SpecificInformation/ eop:localValue**	Additional attribute value	**String**	**0..n**	**0..n**	**0..n**		See previous eop :localAttribute field.

5.1.8 `eop:ProcessingInformation` element

The `eop:ProcessingInformation` element provides information about the processing date, methods and processing center.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**eop:processingCenter**	Processing centre code.	**gml:CodeListType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:processingDate**	Processing date time	**duration**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:compositeType**	Composite type of product, if available	**duration**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:method**	Method used to compute datalayer. (e.g. Kalman filtering, ROSE)	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:methodVersion**	Method version (e.g. 1.0)	**String**	**0..1**	**Ignored**	**Ignored**		
processingMode	**eop:processingMode**	Processing mode. Often referred to as Real Time, Near Real Time etc. Should be a value from ProcessingModeValue.	**eop:ProcessingModeValueType**	**0..1**	**0..1**	**0..1**	This field will be used for the TIMELINESS	
N/A	**eop:processorName**	Processor sofware name (e.g. FastROSE)	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:processorVersion**	Processor software version (e.g. 1.0)	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:processingLevel**	Processing level applied to the product	**eop:ProcessingLevelValueType**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:nativeProductFormat**	Native product format	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**eop:auxiliaryDataSetFileName**	Auxiliary dataset file name	**String**	**0..n**	**Ignored**	**Ignored**		

5.2 Optical EO Product data schema tailoring

The 'opt' schema provides the description of metadata common to all optical Earth Observation Products.

5.2.1 `opt:EarthObservation` element

The `opt:EarthObservation` element has the same properties that the `eop:EarthObservation` element.

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
sensorType	**om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor Type	**String**	**0..1**	**0..1**	**0..1**	Unique value allowed: OPTICAL	OPTICAL
cloudCoverPercentage	**om:result/ eop:EarthObservationResult/ opt:cloudCoverPercentage**	Cloud cover percentage (i.e. uom='%')	**gml:MeasureType**	**0..1**	**0..1**	**0..1**		
N/A	**om:result/ eop:EarthObservationResult/ opt:cloudCoverPercentageAssessmentConfidence**	Cloud cover assessment confidence. Expressed in percents.	**gml:MeasureType**	**0..1**	**ignored**	**ignored**		
N/A	**om:result/ eop:EarthObservationResult/ opt:cloudCoverPercentageQuotationMode**	Indicator to know how the cloud cover percentage has been calculated Value : AUTOMATIC, MANUAL	**eop:EarthObservationResultPropertyType**	**0..1**	**ignored**	**ignored**		
snowCoverPercentage	**om:result/ eop:EarthObservationResult/ opt:snowCoverPercentage**	Snow cover percentage (i.e. uom='%')	**gml:MeasureType**	**0..1**	**0..1**	**0..1**		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**om:result/ eop:EarthObservationResult/ opt:snowCoverPercentageAssessmentConfidence**	Snow cover assessment confidence. Expressed in percents.	**gml:MeasureType**	**0..1**	**ignored**	**ignored**		
N/A	**om:result/ eop:EarthObservationResult/ opt:snowCoverPercentageQuotationMode**	Indicator to know how the snow cover percentage has been calculated Value : AUTOMATIC, MANUAL	**eop:EarthObservation ResultPropertyType**	**0..1**	**ignored**	**ignored**		

5.3 Radar EO Product data schema tailoring

The 'sar' schema provides the description of metadata common to all radar Earth Observation Products.

5.3.1 `sar:EarthObservation` element

The `sar:EarthObservation` element has the same properties that the `eop:EarthObservation` element.

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
sensorType	**om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor Type	**String**	**0..1**	**0..1**	**0..1**	Unique value allowed: RADAR	RADAR
N/A	***om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition***	*Structure extended with thematic elements*	**sar:AcquisitionType**	***0..1***	***1***	***1***	*Is used the sar:Acquisition complex type instead of the defualt eop:Acquisition*	

5.3.2 `sar:Acquisition` element

The `sar:Acquisition` extends the `eop:Acquisition` element with radar specific information

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
polarisationMode	**sar:polarisationMode**	single S, dual D, twin T, quad Q, UNDEFINED Valids : D, Q, S, T, UNDEFINED	**sar:PolarisationModeValueType**	**0..1**	**0..1**	**0..1**		
polarisationChannels	**sar:polarisationChannels**	polarisation channel transmit/receive configuration: horizontal, vertical. Valids: - HH - HV - VH - VV - HH, VV - HH, VH - HH, HV - VH, VV - VH, HV - VV, HV - VV, VH - HV, VH - UNDEFINED	**sar:PolarisationChannelsValueType**	**0..1**	**0..1**	**0..1**		
antennaLookDirection	**sar:antennaLookDirection**	LEFT or RIGHT	**sar:AntennaLookDirectionValueType**	**0..1**	**0..1**	**0..1**		
minimumIncidenceAngle	**sar:minimumIncidenceAngle**	minimum incidence angle	**gml:AngleType**	**0..1**	**0..1**	**0..1**		
maximumIncidenceAngle	**sar:maximumIncidenceAngle**	maximum incidence angle	**gml:AngleType**	**0..1**	**0..1**	**0..1**		
incidenceAngleVariation	**sar:incidenceAngleVariation**	Incidence angle variation	**gml:AngleType**	**0..1**	**0..1**	**0..1**		
dopplerFrequency	**sar:dopplerFrequency**	Doppler Frequency of acquisition	**gml:MeasureType**	**0..1**	**0..1**	**0..1**		

5.4 Altimeter EO Product data schema tailoring

The 'alt' schema provides the description of metadata common to all altimeter Earth Observation Products.

5.4.1 `alt:EarthObservation` element

The `alt:EarthObservation` element has the same properties that the `eop:EarthObservation` element

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
sensorType	**om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor Type	**String**	**0..1**	**1**	**1**	Unique value allowed: ALTIMETRIC	ALTIMETRIC
N/A	***om:procedure/ alt:EarthObservationEquipment***	*Structure extended with thematic elements*	**alt:EarthObservationEquipmentType**	***1***	***1***	***1***		
N/A	***om:featureOfInterest/ alt:Footprint***	*Structure extended with thematic elements*	**alt:FootprintType**	***1***	***1***	***1***		
N/A	***eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ alt:ProcessingInformation***	*Structure extended with thematic elements*	**alt:ProcessingInformationType**	***1***	***1***	***1***		

5.4.2 `alt:EarthObservationEquipment` element

The `alt:EarthObservationEquipment` element provides extension for combined products.

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**eop:platform**	Platform	**Complex**	**0..1**	**Ignored**	**Ignored**	replaced by the repeatable alt:platform	
N/A	**eop:instrument**	Instrument	**Complex**	**0..1**	**Ignored**	**Ignored**	replaced by the repeatable alt:instrument	
sensorType	**eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor type	**String**	**0..1**	**0..1**	**0..1**	Unique value allowed: ALTIMETRIC	ALTIMETRIC
N/A	***eop:acquisitionParameters/ alt:Acquisition***	*Structure extended with thematic elements*	**alt:AcquisitionType**	***0..n***	***1***	***1***		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**alt:instrument**	Cardinality of instrument attribute in base schema is 0..1 For combined products (made with multiple altimeters) there may be more than one primary instrument. Cardinality is therefore modified to 0..n (Note this is separate from the requirement for Auxiliary Instruments). This requirement is for the case when a gridded product for example is the result of more than one instrument.	**eop:InstrumentPropertyType**	**0..n**	**1**	**1**	For synergic/combined products, the instrument is a virtual one representing the various instruments which are combined together	
N/A	**alt:auxiliaryInstrument**	Must be of type alt:AuxiliaryInstrument Auxiliary instruments are a class of instruments that are not the primary instrument. It is desirable to identify them for discovery purposes. e.g. DORIS-DIODE is an auxiliary instrument used in altimetry	**alt:AuxiliaryInstrumentPropertyType**	**0..n**	**Ignored**	**Ignored**		
N/A	**alt:auxiliaryInstrument/ alt:AuxiliaryInstrument/ alt:instrumentType**	The type of the auxiliary instrument. Allowed Values are: • DOPPLER • GPS • LASER • MICROWAVE_RADIOMETER • OTHER	**String**	**0..1**	**Ignored**	**Ignored**		DOPPLER

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**alt:platform**	Cardinality of platform attribute in base schema is 0..1 For combined products (made with multiple altimeters) there may be more than one primary platform. Additional platforms beyond the first are expected to be Cardinality is therefore modified to 0..n	**eop:PlatformPropertyType**	**0..n**	**1**	**1**		

5.4.3 `alt:Footprint` element

The `alt:Footprint` element provides extension for nominal track.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
nominalTrack	**alt:nominalTrack**	A geometry of type GM_Multicurve used to define the nominal track on the earths surface. This track is essentially a line that is representative of the product but does not include points for every value. The use of GM_MultiCurve allows for multiple lines and breaks in lines.	**gml:MultiCurvePropertyType**	**0..1**	**0..1**	**0..1**		

5.4.4 `alt:Acquisition` element

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**alt:cycleNumber**	Number of Cycle	**integer**	**0..1**	**Ignored**	**Ignored**		
N/A	**alt:isSegment**	Acquisition may not be a pass but may be a segment characterised by a start and end time. In this case the isSegment flag should be set to "True" The default value (or the assumed value if not present) is "False"	**boolean**	**0..1**	**Ignored**	**Ignored**		
N/A	**alt:relativePassNumber**	Pass number since start of cycle.	**integer**	**0..1**	**Ignored**	**Ignored**		

5.4.5 `alt:ProcessingInformation` element

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		

N/A	**alt:groundTrackUncertainty**	Measure of the uncertainty of the ground track. Sometimes known as deadband e.g. 1Km deadband.	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
N/A	**alt:productContentsType**	Classification of product according to ground type covered. Note cardinality allows for multiple instances of this property. Allowed Values: • COASTAL • CONTINENTAL • HYDROLOGY • ICE • OPEN_OCEAN • OTHER • REGIONAL	**alt:ProductContentsTypeValueType**	**0..n**	**Ignored**	**Ignored**		
N/A	**alt: samplingRate**	Rate at which samples are provided in product. Some products may contain more than one sampling rate, e.g. 1kHz and 20kHz. Cardinality is therefore zero to many. Must be gml:Measure	**gml:MeasureType**	**0..n**	**Ignored**	**Ignored**		

5.5 Limb-looking EO Product data schema tailoring

The 'lmb' schema provides the description of metadata common to all 5.5 Limb-looking Earth Observation Products.

5.5.1 `lmb:EarthObservation` element

The `lmb:EarthObservation` element has the same properties that the `eop:EarthObservation` element

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
sensorType	**om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor Type	**String**	**0..1**	**0..1**	**0..1**	Unique value allowed: LIMB	LIMB
N/A	***om:featureOfInterest/ lmb:Footprint***	*Structure extended with thematic elements*	**lmb:FootprintType**	***1***	***1***	***1***	*Is used the lmb:Footprint complex type instead of the defualt eop:Footprint*	
N/A	***om:procedure/ eop:EarthObservationEquipment/ lmb:acquisitionParameters***	*Structure extended with thematic elements*	**eop:AcquisitionPropertyType**	***1***	***1***	***1***	*Is used the lmb:Acquisition complex type instead of the defualt eop:Acquisition*	
N/A	***om:procedure/ eop:EarthObservationEquipment/ lmb:Sensor***	*Structure extended with thematic elements*	**eop:SensorPropertyType**	***1***	***1***	***1***	*Is used the lmb:sensor complex type instead of the defualt eop:Acquisition*	

5.5.2 `lmb:Footprint` element

The `lmb:Footprint` element provides extension for measurement, track and occultation information.

Attribute Id	XML element or attribute	Description	Type	Cardinality	ngEO Notes	Sample Value

				Original	ngEO ingestion	ngEO Search results		
N/A	**lmb:maximumAltitude**	Upper bound of measurements in vertical dimension. Must be gml Measure	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
N/A	**lmb:minimumAltitude**	Lower bound of measurements in vertical dimension. Must be gml Measure	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
nominalTrack	**lmb:nominalTrack**	A geometry of type GM_Multicurve is used to define the nominal track on the earths surface. This track is essentially a line that is representative of the product but does not include points for every value. The use of GM_MultiCurve allows for multiple lines and breaks in lines.	**gml:MultiCurvePropertyType**	**0..1**	**0..1**	**0..1**		
occultationPoints	**lmb:occultationPoints**	A set of unstructured occultation points (e.g. with non-astronomical bodies like GPS satellites) at which atmospheric profiles are available within the product.	**gml:MultiPointPropertyType**	**0..1**	**0..1**	**0..1**		

5.5.3 `lmb:Acquisition` element

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**lmb:observationMode**	Observation mode used in acquisition. e.g 'UTLS-1' is one of the seven MIPAS observation modes which determine the sampling regime. Not constrained to codelist at the limb-looking level as these modes are instrument specific.	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**lmb: verticalResolution**	Vertical spacing of data (if regular)	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		

5.5.4 `lmb:Sensor` element

The `lmb:Sensor` element provides extension for measurement type.

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
sensorType	**eop:sensorType**	Sensor type	**String**	**0..1**	**0..1**	**0..1**	Unique value allowed: LIMB	LIMB
N/A	**lmb:measurementType**	Measurement type - ABSORPTION or EMISSION	**lmb:MeasurementTypeValueType**	**0..1**	**Ignored**	**Ignored**		ABSORPTION

5.6 Atmospheric EO Product data schema tailoring

The 'atm' schema provides the description of metadata common to all atmospheric Earth Observation Products.

5.6.1 `atm:EarthObservation` element

The `atm:EarthObservation` element has the same properties that the `eop:EarthObservation` element.

Peculiar values or cardinalities are provided in bold in the following table:

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
sensorType	**om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ eop:sensorType**	Sensor Type	**String**	**0..1**	**0..1**	**0..1**	Unique value allowed: ATMOSPHERIC	ATMOSPHERIC
N/A	***om:result/ atm:EarthObservationResult***	*Structure extended with thematic elements*	**atm:EarthObservationResultType**	***0..1***	***0..1***	***0..1***	*mandatory for acquired products 0 (ignored) for planned products*	

5.6.2 `atm:EarthObservationResult` element

The `atm:EarthObservationResult` extends the `eop:EarthObservationResult` element with data layer information

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
N/A	**atm:dataLayers/ atm:DataLayer**	Data layer information	**atm:DataLayerPropertyType**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:dataLayers/ atm:DataLayer/ atm:speciesError**	Species contained in dataLayer	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:dataLayers/ atm:DataLayer/ atm:species**	Species contained in dataLayer	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:dataLayers/ atm:DataLayer/ atm:unit**	Unit of species in dataLayer	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:dataLayers/ atm:DataLayer/ atm:verticalRange**	Top height of datalayer. May be expressed in meters or other units such as pressure.	**gml:DirectPositionListType**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:dataLayers/ atm:DataLayer/ atm:algorithmName**	Name of algorithm used to compute datalayer	**String**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:dataLayers/ atm:DataLayer/ atm:algorithmVersion**	Algorithm version used to compute datalayer	**String**	**0..1**	**Ignored**	**Ignored**		

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
N/A	**atm:dataLayers/ atm:DataLayer/ atm:verticalRange**	full width at half maximum of the rows of the vertical averaging kernel matrix		**0..1**	**Ignored**	**Ignored**		
cloudCoverPercentage	**atm:cloudCoverPercentage**	Cloud cover percentage (uom should be %)	**gml:MeasureType**	**0..1**	**0..1**	**0..1**	cloudCoverPercentage allows a single value only (This information cannot thus be provided and searched through the classical "quarter scene" mechanism)	
N/A	**atm:cloudCoverPercentageAssessmentConfidence**	Cloud cover assessment confidence. Expressed in percents	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:cloudCoverPercentageQuotationMode**	Indicator to know how the cloud cover percentage has been calculated	**atm:PercentageCoverQuotationModeValueType**	**0..1**	**Ignored**	**Ignored**		
snowCoverPercentage	**atm:snowCoverPercentage**	Cloud cover percentage (uom should be %)	**gml:MeasureType**	**0..1**	**0..1**	**0..1**		
N/A	**atm:snowCoverPercentageAssessmentConfidence**	Snow cover assessment confidence. Expressed in percents	**gml:MeasureType**	**0..1**	**Ignored**	**Ignored**		
N/A	**atm:snowCoverPercentageQuotationMode**	Indicator to know how the snowcover percentage has been calculated	**atm:PercentageCoverQuotationModeValueType**	**0..1**	**Ignored**	**Ignored**		

5.6.3 `atm:Acquisition` element

The `atm:Acquisition` extends the `eop:Acquisition` element with angle information.

Specific elements provided by this extension are ignored by ngEO.

Attribute Id	XML element or attribute	Description	Type	Cardinality			ngEO Notes	Sample Value
				Original	ngEO ingestion	ngEO Search results		
multiViewAngles	**atm:multiViewAngles**	Acquisition footprint viewing angles, given at the multiExtentOf polygon edges and center on the ground (assuming a polygon with 4 corners at the bottom of the atmosphere), i.e. one space separated angle triplet consisting of SolarZenithAngle, LineOfSightZenithAngle and RelativeAzimuth given in degrees, for the rearward, centre and foreward points on the footprint.	**gml:MeasureOrNilReasonListType**	**1**	**1**	**1**	This field were reported as Ignored inside the Metadata ICD even if it's not possible (according to the ATL schema) to have this field optional	
centreViewAngles	**atm:centreViewAngles**	Comma separated triplet of acquisition viewing angles given at the centerOf coordiantes on the ground (bottom of atmosphere), SolarZenithAngle, LineOfSightZenithAngle, RelativeAzimuth given in degrees.	**gml:MeasureOrNilReasonListType**	**1**	**1**	**1**	This field were reported as Ignored inside the Metadata ICD even if it's not possible (according to the ATL schema) to have this field optional	

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