Standard Archive Format for Europe

Mission Specialisation Control Book

JERS

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1. Introduction

1.1. Purpose and scope

The present document is part of the Standard Archive Format for Europe specialisation for JERS (SAFE Specialisation for JERS). This specialisation consists of the following set of documents:

- the current book, which is the JERS mission specialisation control book, and is the top-level document of the specialisation, containing all the information that is common to all SAFE JERS products.
- one JERS product specialisation control book for Level-0 products.

1.2. Book Organisation

The JERS mission specialisation control book is organized as follows:

Chapter 1: Introduction	Introductory part of the document.
Chapter 2: General Description	Overall description of the mission, instruments and products generated for each processing level in scope of this specialisation.
Chapter 3: Metadata Specialisation	SAFE JERS metadata specialisation.
Chapter 4: Naming Conventions	SAFE JERS package names and URN specifications.
Appendix A: Representation Information Packages	List of SAFE JERS Representation Information Packages characteristic of the specialisation.
Appendix B: Representation Information Packages	List of SAFE JERS EO Product Packages examples.

1.3. Specialisation Volume Set

The following list references the documents that constitute the SAFE JERS specialisation volume set.

[JERS-BOOK-MISSION]	JERS Mission Specialisation (PDGS-SAFE-GMV-JERS-MISSION)
[JERS-BOOK-L0]	JERS Specialisation for Level 0 products (PDGS-SAFE-GMV-JERS-L0)

The specialised SAFE JERS Representation Information Packages and examples of SAFE JERS EO Product/Auxiliary Packages are also considered part of the present specialisation and are provided alongside the documents as separate files. The complete file list is described in Appendix A and Appendix B.

1.4. Bibliography

[OAIS-RM] *Reference Model for an Open Archival Information System (OAIS)* - 650.0-B-1- January 2002- Blue Book- Copyright © 2002 Consultative Committee for Space Data Systems (CCSDS) -

[OGC EOP O&M] *Earth Observation Metadata profile of Observations & Measurements* – OGC 10-157r3 version 1.0 (Publication Date: 2012-06-12) Copyright © 2012 Open Geospatial Consortium -with the following set of approved Change Requests:

- *Change proposal: EO PMOS SWG Improved expression of EO product quality and status information, OGC 13-085*
- *Change Proposal: EO PMOS SWG Addition of optional group identificator, OGC 13-086*
- *Change Proposal: EO PMOS SWG Improve the description of EO Product Masks, OGC 13-087*
- *Change Proposal: EO PMOS SWG Correct inconsistencies between UML model and tables, OGC 13-088*
- *Change Proposal: EO PMOS SWG Improved way of expressing the timeliness of EO Product acquisition and processing, OGC 13-093*
- *Change Proposal: EO PMOS SWG Add optional elements referring to products instead of images, OGC 13-094*
- *Change Proposal: EO PMOS SWG Replace example of EO Product Metadata extension, OGC 13-098*
- *Change Proposal: EO-PMOS Corrections related to the implementation of the eoptype attribute, OGC 14-031*
- *Change Proposal: EO-PMOS Addition of optional elements creationDate and modificationDate, OGC 14-032*

[SAFE_CORE] *Standard Archive Format for Europe - Control Book - Volume 1 - Core Specifications* - PGSI-GSEG-EOPG-FS-05-0001- v2.3-

[SAFE_REC_SPEC] *Standard Archive Format for Europe - Control Book - Volume 2 - Recommendations for Specialisations* - PGSI-GSEG-EOPG-FS-05-0002- v2.3-

[SI] *The International System of Units (SI)* - 1998- 7th edition- Bureau International des Poids et Mesures - Copyright © 1998 Organisation Intergouvernementale de la Convention du Mètre -

[SI-SUP2000] *The International System of Units (SI)*- Supplement 2000: addenda and corrigenda of the 7th edition (1998) - 1998- 7th edition- Bureau International des Poids et Mesures – Copyright © 1998 Organisation Intergouvernementale de la Convention du Mètre -

[XFDU] *XML Formatted Data Unit (XFDU) - Structure and Construction Rules* - 661.0-B-1- September 2008- Blue Book - Copyright © 2008 Consultative Committee for Space Data Systems (CCSDS) -

1.5. Glossary of Terms

1.5.1. Definitions

1.5.1.1. General

Auxiliary data	All data used to generate a product, other than the direct measurements of the instrument. EO Auxiliary data include calibration data measured on-board that are not part of the main measurements of the instrument, external calibration files from sources other than the satellite, processor configuration files, and any other files needed by instrument processors.
Auxiliary file-type	A file type that characterizes all EO Auxiliary files sharing common representation information.
EO Product	The result of the processing of remote sensing data. Earth Observation products are specific to each mission and sensor combination. A data product can be an entire acquisition strip (the data segment continuously acquired by a ground station) or a single frame (a subset of the acquisition strip of standard length as defined by the WRS).
Manifest	A document containing metadata about Components, and the relationships among them. This information is stored as a Component, using an XML language designed for just this purpose. [XFDU].
Metadata	Data about other Data [OAIS-RM].
Metadata file	A file containing the Metadata associated to an EO Product or EO Auxiliary file.
Product-type	A file type that characterizes all the EO Product files sharing common representation information.
SAFE Package	An XFDU Package specialised for Earth Observation data purposes. In previous versions of SAFE, the term SAFE product was used instead because the content information was limited to Earth Observation products. It has been replaced by SAFE Package because the types of Content Information described by SAFE are not only Earth Observation products, but also Representation Information files and EO Auxiliary files.
SAFE Specialisation	A SAFE Specialisation is a restriction of the SAFE Core specifications for a more specific type of data. Examples of SAFE Specialisation include specialisations for ENVISAT or LANDSAT Products, for CCSDS Telemetry Data, or for SPOT Measurements.
XFDU Package	A Package Interchange File that contains an XFDU Manifest and is conforming to the semantics specified in the XFDU Specifications. An XFDU Package is a specialization of Package Interchange File [XFDU].

1.5.2. Acronyms and Abbreviations

1.5.2.1. General

CCSDS	Consultative Committee for Space Data Systems
EO	Earth Observation
ESA	European Space Agency
GML	Geography Mark-up Language
ISO	International Organization for Standardization
MMCC	Mission Monitoring and Control Center
O&M	Observations and Measurements
OAIS(-RM)	Reference Model for an Open Archival Information System
OGC	Open Geospatial Consortium
SAFE	Standard Archive Format for Europe
SI	The International System of Units
URN	Uniform Resource Name
WRS	World Reference System
XFDU	XML Formatting Data Unit
XML	eXtensible Mark-up Language

1.5.2.2. Specialisation

JAXA	Japanese Aerospace eXploration Agency (former NASDA)
JERS	Japanese Earth Resources Satellite
ICD	Interface Control Document
MITI	Ministry of International Trade and Industry (Japan)
NASDA	National Space Development Agency (nowadays JAXA)
OPS	Optical Sensor
PDS	Payload Data Segment
RA	Radar Altimeter
S/C	Spacecraft
SAR	Synthetic Aperture Radar
STA	Science and Technology Agency (Japan)

1.5.3. Conventions Used

The present book assumes that all physical quantities are expressed according to a standard system of units. The selected standard is the SI defined by the Bureau International des Poids et Mesures (BIPM) in documents [SI] and [SI-SUP2000].

2. General Description

2.1. Mission Overview

JERS-1 (nickname of FUYO-1) was an Earth Observation satellite whose primary objective was to gather data on global land masses while conducting observation for land surveys, agricultural-forestry-fishieries, environmental protection, disaster prevention and coastal surveillance, with emphasis on locating natural resources. In order to optimize accuracy in measurements, JERS-1 was equipped with SAR (Synthetic Aperture Radar), an active microwave sensor, and OPS, an optical sensor that measures light reflected from the Earth's surface ranging from visible light to short wave infra-red light. JERS-1 was a joint project of NASDA (now JAXA), MITI and STA. NASDA was responsible for the main satellite unit and MITI was responsible for the measuring instruments.

Since its launching in 1992, the satellite had continued to supply observation data to users in Japan and abroad. Though the design life of JERS-1 was 2 years, the satellite had obtained observational data for more than 6 years, and ended the mission on October 12, 1998.

On Oct. 11, 1998 a malfunction occurred on JERS-1 (very probably an attitude control system failure) causing a termination of satellite operations. Hence, a total of about 6 1/2 years of observation time was achieved with JERS-1 (with a design life of 2 years). - Already in August 1997, the JERS-1 spacecraft had lost the ability to record data, therefore limiting its coverage to areas within JERS-1 ground station masks.

Mission details	Launched: 11 February 1992 End of operations: 2 October 1998
Mission objectives:	The mission applications focused on survey of geological phenomena, land usage, observation of coastal regions, geologic maps, environment and disaster monitoring and demonstration of two-pass SAR interferometry for change detection.
Mission orbit:	Sun-synchronous subrecurrent polar orbit; inclination = 97.7º; repeat cycle = 44 days (westward); altitude = 568 km; period = 96 minutes, local mean time = 10:30 - 11:00 AM on descending node.
Configuration:	Spacecraft consists of a net rectangular bus (0.9 m x 1.8 m x 3.2 m) with a single 2 kW solar array (3.5 m x 7.0 m) and an eight-segmented SAR antenna. The spacecraft is three-axis stabilized with zero momentum bias system using reaction wheels and magnetotorquers. The attitude is sensed by an Earth sensor, an inertial reference unit and two sun sensors (0.3º attitude knowledge). A hydrazine propulsion system is used for orbit maintenance. Satellite mass = 1400 kg at launch.
Payload	• **SAR**: (Synthetic Aperture Radar) Measurement in L-band (1.275 GHz) in HH polarization. The instrument consists of the following subsystems: antenna, transmitter/receiver, and signal processor. The SAR antenna is composed of eight 2.2 m x 1.5 m panels, measuring 2.2 m x 11.9 m in total. • **OPS**: (Optical Sensor) OPS is a high-resolution radiometer (a passive instrument) with the objective to measure sunlight reflected by the

	Earth's atmosphere in eight bands (colour imagery). OPS consists actually of two independent radiometers: the VNIR band instrument and the SWIR radiometer.
Launch	The JERS-1 satellite was launched on Feb. 11, 1992 from Tanegashima Space Center by a two-stage H-I launch vehicle of NASDA.

Table 1: JERS-1 Mission summary

2.2. Instrument Overview

2.2.1. SAR (Synthetic Aperture Radar)

Measurement in L-band (1.275 GHz) in HH polarization. The instrument consists of the following subsystems: antenna, transmitter/receiver, and signal processor. The L-band SAR of JERS-1 demonstrated also two-pass SAR-interferometry for change detection.

SAR on-board calibration is for receiver gain. The parameter derived from the SAR image mode is the normalized radar backscattering coefficient, sigma-zero. The absolute accuracy of the image product is dependant upon the calibration efforts undertaken at each processing facility.

Type	Synthetic Aperture radar (SAR)
Technical Characteristics	
Center frequency	1.275 GHz (L-band, 23.5 cm wavelength)
Bandwidth	15 MHz
Spatial resolution	18 m (range) x 18 m (azimuth, 3 looks)
Swath width	75 km
Transmitting power	1100-1500 W
Pulse width	35 µs
PRF (Pulse Repetition Frequency)	1505.8 - 1606.0 Hz
Antenna	Array of 1024 microstrip radiation elements • Polarization: HH • Look angle: 35.21º • Antenna gain: >33.5 dB • Signal to ambiguity ratio: >14 dB
Data quantization	3 bits
Data rate	60 Mbit/s
Earth Topics	Gather data on global land masses while conducting observation for land surveys, agricultural-forestry-fishieries, environmental protection, disaster prevention and coastal surveillance, with emphasis on locating natural resources.

Table 2: SAR Instrument summary

2.2.2. OPS (Optical Sensor)

OPS is a high-resolution radiometer (a passive instrument) with the objective to measure sunlight reflected by the Earth's atmosphere in eight bands (colour imagery). OPS consists actually of two independent radiometers:

- VNIR band instrument: The VNIR radiometer has a telescope with aspherical lenses (refractive optics) and a dichroic prism. The Si-CCD detectors have 4096 elements. There are four detectors, one for each band. A reference light source unit emits a calibration light during the eclipse period of the orbit to check the radiometric performance of the radiometer.
- SWIR radiometer: The SWIR radiometer telescope uses reflective and refractive optical systems. Detectors: PtSi Schottky CCDs with 2048 pixels per row and 4096 pixels per band. The CCDs are cooled to 77-82 K. A reference light source provides sensor calibration. The total instrument power is 250 W.

Type	Optical Sensor (Ops)
Technical Characteristics	
Swath width	75 Km
Spatial resolution	18.3 (cross-track direction) x 24.2 m (along-track direction).
Spectral range	Band Spectral range 1 0.52 - 0.60 µm VIS (green) 2 0.63 - 0.69 µm VIS (red) 3 0.76 - 0.86 µm NIR 4 0.76 - 0.86 µm NIR 5 1.60 - 1.71 µm (SWIR) 6 2.01 - 2.12 µm (SWIR) 7 2.13 - 2.25 µm (SWIR) 8 2.27 - 2.40 µm (SWIR)
Lens	VNIR: Aperture: 43 mm in diameter; f: 5; Focal Length: 215 SWIR: Aperture: 200mm in diameter; f: 1.55; Focal Length: 310 mm
Mass	VNIR: 32Kg; SWIR: 60Kg (The total instrument mass (common electronics = 82 kg) is 174 kg)
Earth Topics	Vegetation surveys, land use, water monitoring (band 1); Chlorophyll absorption for vegetation differentiation (band 2); Biomass surveys (bands 3 and 4); Vegetation moisture (band 5); Hydrothermal mapping (eg. soils; geology) (band 6, 7 and 8).

Table 3: Ops Instrument summary

2.3. Product file-type List

The following sections list all the product-types and auxiliary-types which are in scope of the SAFE Specialisation for JERS.

2.3.1. Level 0

2.3.1.1. Product Types

Acronym	Description
JSA_RAW_0P	JERS SAR Level 0 data.
JSA_OPS_0P	JERS OPS Level 0 data.

Table 4: L0 product-type list

2.4. Processing chain description

2.4.1. IM SAR Processing Chain

This section provides a conceptual workflow description for the JERS-1 SAR processing chain, giving general information about the process and the inputs/outputs that are needed/generated in each step.

The general, high level processing chain showing the mandatory inputs and all possible outputs is shown in Figure 1

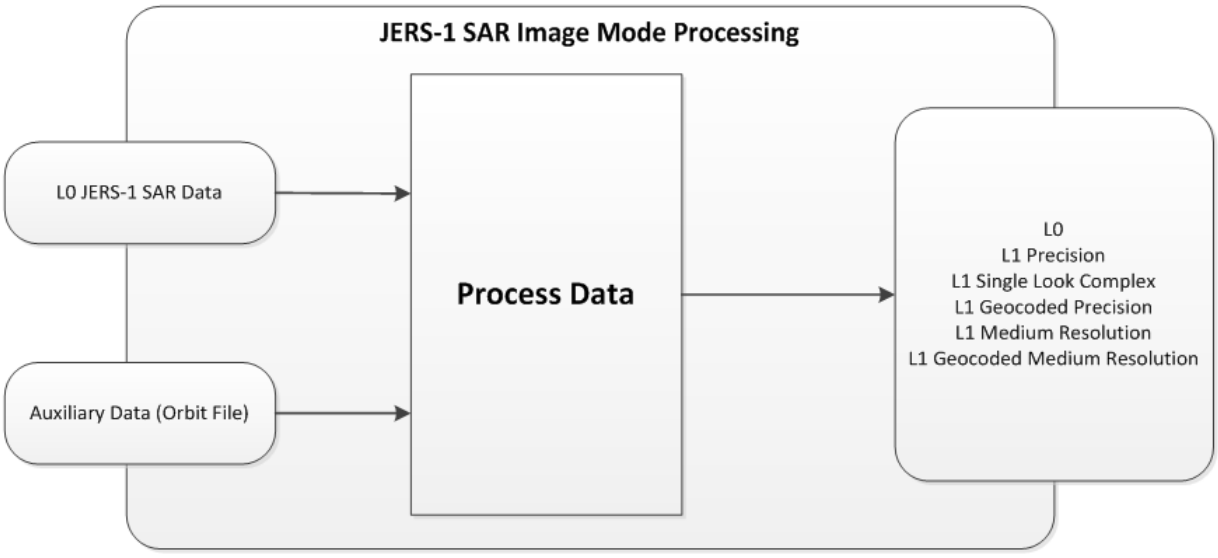

Figure 1: Generic high level processing chain showing inputs and possible outputs of the processing chain.

Summary information about the ERS processor is shown in Table 5

Instrument:	JERS-1 SAR
Output Processing Level:	L0, L1
Known/reference implementations	
Developer:	Phoenix Systems
Documentation reference:	JERS Instrument Processing Facility (IPF) Interface Control Document, AG/08/00705, latest issue.
Possibility to reuse the processor:	Yes (ESA)

Possibility to modify the processor:	No (binary)

Table 5: Summary information about JERS-1 SAR processor.

2.4.1.1. Image Mode L1 SAR processing outputs

The processing chain for L1 SAR image mode data showing the required inputs and possible outputs is shown in Figure 2.

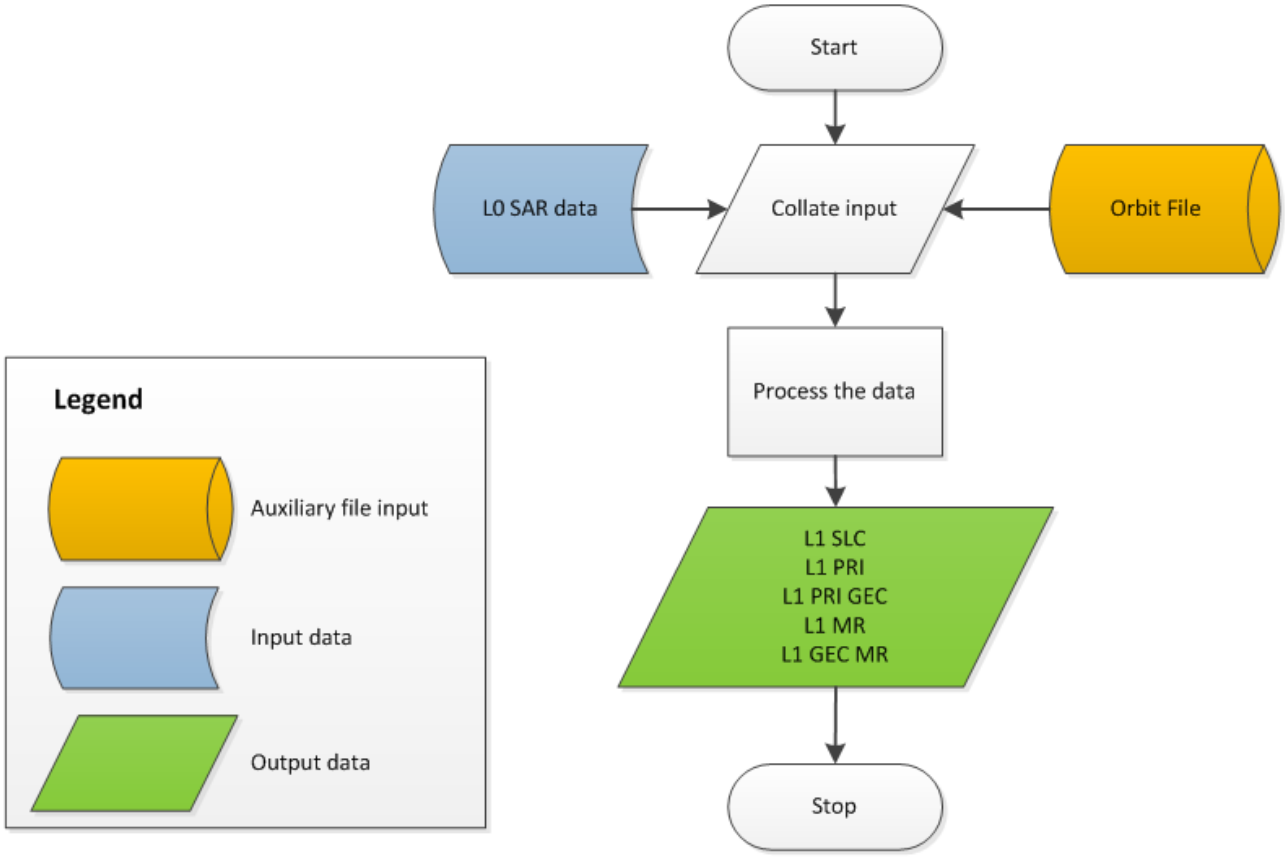

Figure 2: L1 SAR processing chain showing inputs and possible outputs.

The inputs required and the possible L1 SAR outputs generated in L1 processing are listed below. The processor will use L0 SAR input and can produce L1 as follows:

- Single Look Complex (SLC)
- Precision Image (PRI)
- Geocoded (GEC) Precise
- Medium Resolution (MR)
- Geocoded (GEC) MR

The orbit file is the mandatory auxiliary file input.

Input	Processor	Output	Destination (next Processor)
Product-types:	JERS SAR IPF	**Product-types:**	N/A
L0 SAR Data		L1 SLC	

Input	Processor	Output	Destination (next Processor)
		L1 PRI L1 PRI GEC L1 MR L1 GEC MR	
Auxiliary-types:		**Auxiliary-types**	
Orbit File: JE01_AUX_SV		N/A	

Table 6: JERS-1 SAR L1 Inputs/Outputs

2.4.2. VNIR OPS Processing Chain

This section provides a conceptual workflow description for the JERS-1 OPS processing chain for VNIR (Visible and Near Infrared Radiometer), giving general information about the process and the inputs/outputs that are needed/generated in each step.

The general, high level processing chain showing the mandatory inputs and all possible outputs is shown in Figure 3.

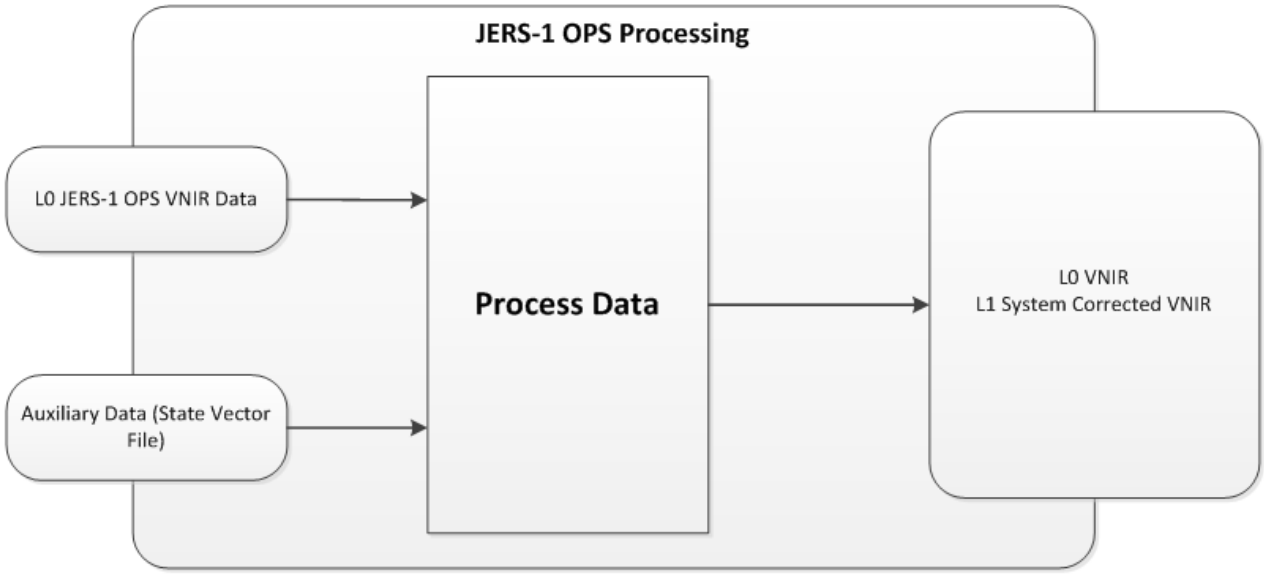

Figure 3: Generic high level processing chain showing inputs and possible outputs of the processing chain.

Summary information about the JERS processor is shown in Table 7

Instrument:	JERS-1 OPS
Output Processing Level:	L0, L1
Known/reference implementations	
Developer:	ACS
Documentation reference:	Third Party Mission Interface Control Document, TPML-TN-ACS-GS-0158, Issue 1.6 JERS-1 Optical (OPS) Format Description, B0-921223-0, Issue 1.0

Possibility to reuse the processor:	Yes (ESA)
Possibility to modify the processor:	No (binary)

Table 7: Summary information about JERS-1 OPS processor.

2.4.2.1. VNIR L1 processing outputs

The processing chain for L1 VNIR image mode data showing the required inputs and possible outputs is shown in Figure 4.

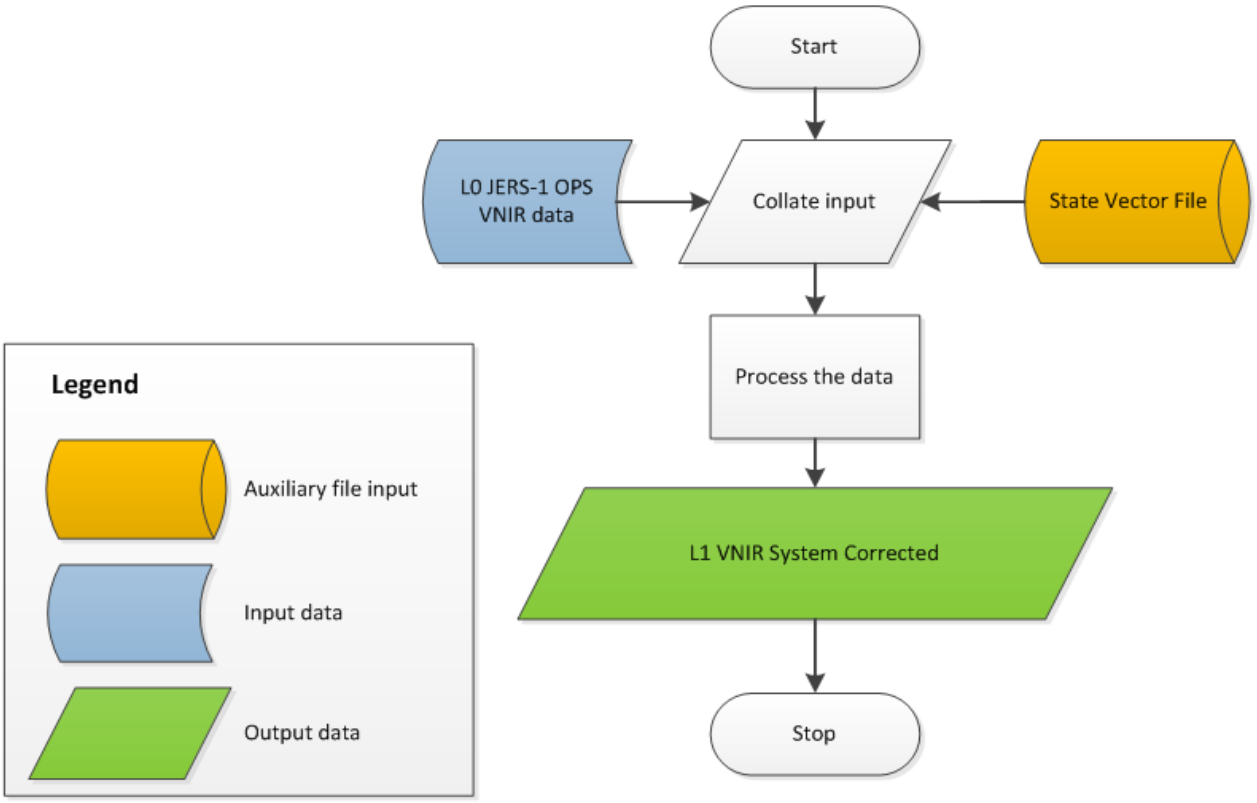

Figure 4: L1 OPS VNIR processing chain showing inputs and possible outputs

The processor uses L0 OPS VNIR input and produces L1 System Corrected output.
The state vector file is the mandatory auxiliary file input.

Input	Processor	Output	Destination (next Processor)
Product-types:	JERS OPS IPF	**Product-types:**	N/A
JSA_OPS_0P		JSA_SYC_1P	
Auxiliary-types:		**Auxiliary-types**	
State Vector File: JE01_AUX_SV		N/A	

Table 8: JERS-1 OPS VNIR L1 Inputs/Outputs

3. Metadata Specialisation

All metadata types that are defined from scratch or modified by the present specialisation have been included in this section. Several of the non-modified metadata types, such as those from XFDU or from OGC EOP O&M, are not repeated in the present book as they are considered implicitly inherited and therefore, unchanged (the reader is simply referred to the corresponding schemas). However, for some of the OGC EOP O&M metadata types, additional clarifications or restrictions applicable to the SAFE specialisation for JERS are provided.

This section details:

1) the specific metadata elements that are considered applicable from the [OGC EOP O&M] metadata model for the SAFE EO products.
2) the specific metadata elements that are considered applicable from the SAFE scene set metadata model (safe-ssm.xsd) for the EO Scene Product (that can be obtained from the data striplines measured by the SAR instrument).

As part of this specialisation, the following sections describe the extensions that are needed to be included in the metadata models to allocate a particular metadata not foreseen by the model, and/or to restrict the metadata model to accommodate some of the values that are required by the JERS products/auxiliary files.

3) the specific metadata elements that are considered applicable from the SAFE auxiliary metadata model (safe-aux.xsd) for the Auxiliary files.

The metadata specialisation has been classified by different abstraction levels (column “Abstraction”):

- Mission level (M): These metadata are common to all products generated for the mission.
- Instrument level (I): These metadata are common to all products generated for a specific instrument.
- Processing level (P): These metadata are common to all products generated for a specific product level. In this case, the specialisation is specified in a separate control book (i.e. [JERS-BOOK-L0] for L0 products).

3.1. EO Products

The following table represents the metadata specialisation with respect to the OGC EOP O&M metadata model applicable to all products of the JERS mission (applicable version of the OGC EOP O&M metadata model is referenced in [OGC EOP O&M]).

Where:

- ***XML element or attribute***: Element or attribute from the EOP O&M metadata model (leaf node is in black).
- ***Cardinality:*** Cardinality of the element/attribute tailored for the mission.

- ***Description:*** Brief description of the element/attribute.
- ***Format/Allowed Values:*** Expected format and possible values identified for the mission.

3.1.1. Metadata specialisation at Mission level

The following table describes all the metadata elements that must be present in the metadata file of a SAFE EO Product package generated for JERS:

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file
eop:EarthObservation/ *om:phenomenonTime/* *gml:TimePeriod/* **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file
eop:EarthObservation/ *om:phenomenonTime/* *gml:TimePeriod/* **gml:beginPosition**	1	Acquisition start date time in ISO 8601 format.	Format: CCYY-MMDDThh:mm[:ss[.cc]]Z
eop:EarthObservation/ *om:phenomenonTime/* *gml:TimePeriod/* **gml:endPosition**	1	Acquisition end date time in ISO 8601 format	Format: CCYY-MMDDThh:mm[:ss[.cc]]Z
eop:EarthObservation/ *om:resultTime/* *gml:TimeInstant/* **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file
eop:EarthObservation/ *om:resultTime/* *gml:TimeInstant/* **gml:timePosition**	1	The time when result becomes available in ISO 8601 format.	Format: CCYY-MMDDThh:mm[:ss[.cc]]Z Same value as the metadata element: *eop:EarthObservation/* *om:phenomenonTime/* *gml:TimePeriod/*

XML element or attribute	Cardinality	Description	Format/Allowed values
			gml:endPosition
sar:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:platform/ eop:Platform/ **eop:shortName**	1	Platform short name.	Format: String Value: **JERS**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:platform/ eop:Platform/ **eop:serialIdentifier**	0,1	Platform serial identifier	Format: String Value: **1**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:instrument/ eop:Instrument/ **eop:shortName**	1	Instrument (Sensor) name	Format: String Possible values: • **SAR** • **OPS**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ **eop:sensorType**	1	Sensor type.	Format: String Possible values: • **RADAR** • **OPTICAL**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:sensor/ eop:Sensor/ **eop:operationalMode**	1	Sensor mode. Possible values are mission specific and should be retrieved using codeSpace.	Format: String Value: **IM**
eop:EarthObservation/ om:procedure/	1	Acquisition orbit number	Format: Integer

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **eop:orbitNumber**			
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **eop:orbitDirection**	1	Acquisition orbit direction	Format: String Possible values: • **ASCENDING** • **DESCENDING**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **eop:wrsLongitudeGrid**	1	Neutral wrsLongitudeGrid to replace track in track/frame, K in K/J, etc.	Format: String
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ eop:wrsLongitudeGrid/ **@codeSpace**	1	Code space of the WRS. Used to point the reference grid	Format: String Value: **urn:esa:eop:JERS:1:relativeOrbits**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **eop:wrsLatitudeGrid**	1	Neutral wrsLatitudeGrid to replace frame in track/frame, J in K/J, etc.	Format: String
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ eop:wrsLatitudeGrid/ **@codeSpace**	1	Code space of the WRS. Used to point the reference grid.	Format: String Value: **urn:esa:eop:JERS:1:relativeOrbits**
eop:EarthObservation/ **om:observedProperty**	1	xlink to the observed property definition	This field is mandatory but not used and has to be set to null as reported below. `<om:observedProperty xsi:nil="true" nilReason="inapplicable"/>`

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ *om:featureOfInterest/* *eop:Footprint/* @gml:id	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file.
eop:EarthObservation/ *om:featureOfInterest/* *eop:Footprint/* *eop:multiExtentOf/* *gml:MultiSurface/* **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file.
eop:EarthObservation/ *om:featureOfInterest/* *eop:Footprint/* *eop:multiExtentOf/* *gml:MultiSurface/* *gml:surfaceMember/* *gml:Polygon/* **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file.
eop:EarthObservation/ *om:featureOfInterest/* *eop:Footprint/* *eop:multiExtentOf/* *gml:MultiSurface/* *gml:surfaceMember/* *gml:Polygon/* *gml:exterior/* *gml:LinearRing/* **gml:posList**	1	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).	Format: String The footprint is made by the following points (seen from flight direction): first right right side standard scene corners last right last left left side standard scene corners first left first right (repeated to close the polygon) The Polygon geometry shall be encoded in the EPSG:4326 geographic coordinate reference system and the coordinate pairs shall be ordered as lat /lon. Polygons enclose areas with points listed in CCW direction.
eop:EarthObservation/ *om:result/* *eop:EarthObservationResult/* ***@gml:id***	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	String.The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ om:result/ eop:EarthObservationResult/ eop:product/ eop:ProductInformation/ eop:fileName/ ows:ServiceReference/ **@xlink:href**	1	URN Reference to the EO product package.	Format: String
eop:EarthObservation/ om:result/ eop:EarthObservationResult/ eop:product/ eop:ProductInformation/ eop:fileName/ ows:ServiceReference/ **ows:RequestMessage**	1	OWS request message.	This mandatory element shall be left blank
eop:EarthObservation/ om:result/ eop:EarthObservationResult/ eop:product/ eop:ProductInformation/ **eop:version**	1	Product version. Used for Processing Baseline	Format: String Value: **JODC_01.00**
eop:EarthObservation/ om:result/ eop:EarthObservationResult/ eop:product/ eop:ProductInformation/ **eop:size**	1	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 Product Facility must at least provide an estimation of the size if not the real one.	Format: Long Integer
eop:EarthObservation/ om:result/ eop:EarthObservationResult/ eop:product/ eop:ProductInformation/ **eop:timeliness**	1	Timeliness of the product, such as "near real time", "rush". Possible values are mission specific and shall refer to mission/ground segment dedicated codeSpace.	Format: String Possible values: • **NRT** • **NOMINAL**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ ***eop:identifier***	1	Identifier for metadata item, includes ground segment namespace to guarantee uniqueness within EOP (Product name without extension)	Format: String

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ **eop:parentIdentifier**	0,1	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.	Format: String Possible Values: • **JE01_JSA_RAW_0P**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ **eop:acquisitionType**	1	Used to distinguish at a high-level the appropriateness of the acquisition for "general" use.	Format: String Possible values: • **NOMINAL** • **CALIBRATION**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ **eop:productType**	1	Describes product type in case that mixed types are available within a single collection, this is ground segment specific definition.	Format: String Possible values: • **JSA_RAW_0P** • **JSA_OPS_0P**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ **eop:status**	1	Product status. 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.	Format: String Possible values: • **ARCHIVED** • **ACQUIRED** • **CANCELLED** • **FAILED** • **PLANNED** • **POTENTIAL** • **REJECTED**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ **eop:statusSubType**	1	In case of status = ARCHIVED it can assume two values: ON-LINE or OFF-LINE.	Format: String Possible values: • **ON-LINE** • **OFF-LINE**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ **eop:productQualityDegradation**	0,1	Quality degradation percentage. Could be used for the Missing Line information.	Format: String Possible values:

XML element or attribute	Cardinality	Description	Format/Allowed values
			• **GEOMETRY** • **MISSING_LINES** • **HighRFI**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* ***eop:productQualityDegradation/*** ***@uom***	0,1	Unit of Mesure It is mandatory if productQualityDegradation is available.	Format: String Value: **%**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* ***eop:productQualityDegradationQuotationMode***	0,1	Indicator to know how the quality degradation percentage has been calculated. It is mandatory if productQualityDegradation is available.	Format: String Value: • **AUTOMATIC** • **MANUAL**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* **eop:productQualityStatus**	0,1	Quality status, e.g. after the product passed a quality check.	Format: String Possible values: • **DEGRADED** • **NOMINAL**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* ***eop:productDegradationTag***	0,1	Keywords giving information on the degradations affecting the product. Possible vlaues are mission specific and can be freely define (e.g. "RADIOMETRY", "MISSING_LINES", "HighRFI", ...) This optional field must be provided if eop:productQualityStatus value is DEGRADED	Format: String Possible values: • **GEOMETRY** • **MISSING_LINES** • **HighRFI**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* **eop:productQualityReportURL**	1	URL of an external detailed quality report.	Format: String
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:processing/*	1	Processing centre code .	Format: String Possible values:

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:ProcessingInformation/ **eop:processingCenter**			(Three letter code operationally defined)
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ eop:ProcessingInformation/ **eop:processingDate**	1	Processing date time.	Format: CCYY-MMDDThh:mm[:ss[.cc]]Z
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ eop:ProcessingInformation/ **eop:processorName**	0,1	Processor software name	Format: String Value: **JODC**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ eop:ProcessingInformation/ **eop:processorVersion**	1	Processor version.	Format: String
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ eop:ProcessingInformation/ **eop:processingLevel**	1	Processing level applied to the product.	Format: String Value: **other: L0**
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ eop:ProcessingInformation/ **eop:nativeProductFormat**	1	Native product format.	Format: String
eop:EarthObservation/ eop:metaDataProperty/ eop:EarthObservationMetaData/ eop:processing/ eop:ProcessingInformation/ **eop:processingMode**	1	Processing mode. Often referred to as Real Time, Near Real Time etc. Should be a value from ProcessingModeValue.	Format: String Value: **OFFLINE**
eop:EarthObservation/ eop:metaDataProperty/	1	Auxiliary dataset file name. Filename of the Ephemerides.	Format: String

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservationMetaData/ *eop:processing/* *eop:ProcessingInformation/* **eop:auxiliaryDataSetFileName**			

Table 9: EOP O&M Metadata tailoring for JERS EO Products

3.2. *Metadata specialisation at Instrument level*

The following sections describe the metadata elements that must be present in a metadata file of a SAFE EO Product package depending on the Instrument.

3.2.1. JERS-SAR

The following table specifies the metadata elements that must be present in a metadata file of a SAFE EO Product package obtained from the data measured by the JERS-SAR instrument:

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:sensor/* *eop:Sensor/* **eop:resolution**	1	Image resolution (meters)	Format: Integer Value: **25**
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* *sar:Acquisition/* **sar:polarisationMode**	1	Polarisation Mode.	Format: String Value: **S** *(S: single)*
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* *sar:Acquisition/* **sar:polarisationChannels**	1	Polarisation Channels.	Format: String Value: **HH**

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **sar:antennaLookDirection**	1	Polarisation channel transmit/receive configuration: horizontal, vertical.	Format: Double
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **sar:minimumIncidenceAngle**	1	Minimum Incidence angle.	Format: Double Value: **32**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ sar:minimumIncidenceAngle **@uom**	1	Unit of measure.	Format: String Value: **degrees**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **sar:maximumIncidenceAngle**	1	Maximum Incidence angle.	Format: Double Value: **38**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **@uom**	1	Unit of measure.	Format: String Value: **degrees**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/ **sar:incidenceAngleVariation**	1	Incidence angle variation	Format: Double Value: **6**
eop:EarthObservation/ om:procedure/ eop:EarthObservationEquipment/ eop:acquisitionParameters/ sar:Acquisition/	1	Unit of measure	Format: String Value: **degrees**

XML element or attribute	Cardinality	Description	Format/Allowed values
sar:incidenceAngleVariation **@uom**			
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* *sar:Acquisition/* **sar:dopplerFrequency**	1	Doppler Frequency of acquisition at scene centre in Hz	Format: Double
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* *sar:Acquisition/* *sar:dopplerFrequency* **@uom**	1	Unit of measure	Format: String Value: **Hz**
eop:EarthObservation/ *om:featureOfInterest/* *eop:Footprint/* **@gml:id**	1	Mandatory identifier required by GML. Its value must be unique among all the gml:id attributes of the XML file.	Format: String The convention is to use eop:identifier + _N (as a suffix), where N is a counter starting from 1 and incremented with each gml:id attribute present in a given file.

Table 10: EOP O&M Metadata tailoring for JERS-SAR EO Products

3.2.2. JERS-VNIR

The following table specifies the metadata elements that must be present in a metadata file of a SAFE EO Product package obtained from the data measured by the JERS-VNIR instrument:

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* ***eop:Acquisition/*** **eop:illuminationAzimuthAngle**	1	Mean illumination/solar azimuth angle.	Format: Double
eop:EarthObservation/ *om:procedure/*	1	Unit of measure	Format: String

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservationEquipment/ *eop:acquisitionParameters/* ***eop:Acquisition/*** *eop:illuminationAzimuthAngle* **@uom**			Value: **deg**
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* ***eop:Acquisition/*** **eop:illuminationZenithAngle**	1	Mean illumination/solar zenith angle.	Format: Double
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* ***eop:Acquisition/*** ***eop:illuminationZenithAngle*** **@uom**	1	Unit of measure	Format: String Value: **deg**
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* *eop:Acquisition/* **eop:illuminationElevationAngle**	1	Mean illumination/solar elevation angle.	Format: Double
eop:EarthObservation/ *om:procedure/* *eop:EarthObservationEquipment/* *eop:acquisitionParameters/* *eop:Acquisition/* *eop:illuminationElevationAngle* **@uom**	1	Unit of measure	Format: String Value: **deg**
eop:EarthObservation/ *om:result/* *eop:EarthObservationResult/* *eop:product/* *eop:ProductInformation/* **eop:timeliness**	1	Timeliness of the product, such as "near real time", "rush". Possible values are mission specific and shall refer to mission/ground segment dedicated codeSpace.	Format: String Value: **REPROCESSING**
eop:EarthObservation/ *om:result/* *eop:EarthObservationResult/* ***eop:product/*** **opt:cloudCoverPercentage**	1	Cloud cover percentage.	Format: Integer Possible values: [0-100] or -1 if cloud coverage is not available.

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ *om:result/* *eop:EarthObservationResult/* ***eop:product/*** ***opt:cloudCoverPercentage*** **@uom**	1	Unit of Mesure It is mandatory if cloudCoverPercentage is available.	Format: String Value: **%**
eop:EarthObservation/ *om:result/* *eop:EarthObservationResult/* ***eop:product/*** **opt:cloudCoverPercentageQuotationMode**	1	Indicator to know how the cloud cover percentage has been calculated. Values: - AUTOMATIC - MANUAL	Format: String Value: **MANUAL**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localAttribute** **[upperLeft_Cloud_Vote]**	1	The pair localAttribute/localValue is used to provide additional attributes in the product metadata without changing the model.	Format: String Value: **upperLeft_Cloud_Vote**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localValue** **[upperLeft_Cloud_Vote]**	1	upperLeft_Cloud_Vote	Format: String Possible values are 0-9, in case the cloud vote information are not available the * symbol is used.
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localAttribute** **[upperRight_Cloud_Vote]**	1	The pair localAttribute/localValue is used to provide additional attributes in the product metadata without changing the model.	Format: String Value: **upperRight_Cloud_Vote**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localValue** **[upperRight_Cloud_Vote]**	1	upperRight_Cloud_Vote	Format: String Possible values are 0-9, in case the cloud vote information are not available the * symbol is used.

XML element or attribute	Cardinality	Description	Format/Allowed values
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localAttribute** **[lowerLeft_Cloud_Vote]**	1	The pair localAttribute/localValue is used to provide additional attributes in the product metadata without changing the model.	Format: String Value: **lowerLeft_Cloud_Vote**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localValue** **[lowerLeft_Cloud_Vote]**	1	lowerLeft_Cloud_Vote	Format: String Possible values are 0-9, in case the cloud vote information are not available the * symbol is used.
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localAttribute** **[lowerRight_Cloud_Vote]**	1	The pair localAttribute/localValue is used to provide additional attributes in the product metadata without changing the model.	Format: String Value: **lowerRight_Cloud_Vote**
eop:EarthObservation/ *eop:metaDataProperty/* *eop:EarthObservationMetaData/* *eop:vendorSpecific/* ***eop:SpecificInformation/*** **eop:localValue** **[lowerRight_Cloud_Vote]**	1	lowerRight_Cloud_Vote	Format: String Possible values are 0-9, in case the cloud vote information are not available the * symbol is used.

Table 11: EOP O&M Metadata tailoring for JERS-OPS EO Products

4. Naming Conventions

4.1. JERS SAR

4.1.1. Level 0 Products

4.1.1.1. Package Names

Representation Information Metadata package
JSA_RAW_0P_RPI-MTD_<*cccc*>.SAFE
Representation Information Data package
JSA_RAW_0P_RPI-DAT_<*cccc*>.SAFE
Naming convention for Collection package
JSA_RAW_0P_COL-MTD_<*cccc*>.SAFE
Naming convention for product packages
JSA_RAW_0P_<*start*>_<*stop*>_<*procCenter*>_<*orbit*>_<*nnnn*>_<*cccc*>.SAFE

Table 12: SAFE Package Names for JERS SAR L0 products

Where:

<*start*>	Start date/time of the product from the UTC time of the first DSR (15 characters: YYYYMMDD_hhmmss)
<*stop*>	Stop date/time of the product (15 characters: YYYYMMDDThhmmss)
<*procCenter*>	Processing center (3 characters)
<*orbit*>	Orbit number (4 characters)
<*nnnn*>	Numerical wrap-around counter for quick file identification (4 characters).
<*cccc*>	Is the CRC-16 value calculated over the manifest file inside the SAFE Package (4 characters).

4.1.1.2. URN Specifications

Representation Information Metadata package
urn:x-safe:JERS:JSA_RAW_0P_RPI-MTD
Representation Information Data package
urn:x-safe:JERS:JSA_RAW_0P_RPI-DAT
Naming convention for collection package
urn:x-safe:JERS:JSA_RAW_0P_COL-MTD
Naming convention for product packages
urn:x-safe:JERS:JSA_RAW_0P_<*start*>_<*stop*>_<*procCenter*>_<*orbit*>_<*nnnn*>

Table 13: URN Specification for JERS SAR L0 packages

4.2. JERS OPS

4.2.1. Level 0 Products

4.2.1.1. Package Names

Representation Information Metadata package
JSA_OPS_0P_RPI-MTD_<*cccc*>.SAFE
Representation Information Data package
JSA_OPS_0P_RPI-DAT_<*cccc*>.SAFE
Naming convention for Collection package
JSA_OPS_0P_COL-MTD_<*cccc*>.SAFE
Naming convention for product packages
JSA_OPS_0P_<*start*>_<*stop*>_<*procCenter*>_<*orbit*>_<*nnnn*>_<*cccc*>.SAFE

Table 14: SAFE Package Names for JERS OPS L0 products

Where:

<*start*>	Start date/time of the product from the UTC time of the first DSR (15 characters: YYYYMMDD_hhmmss)
<*stop*>	Stop date/time of the product (15 characters: YYYYMMDDThhmmss)
<*procCenter*>	Processing center (3 characters)
<*orbit*>	Orbit number (4 characters)
<*nnnn*>	Numerical wrap-around counter for quick file identification (4 characters).
<*cccc*>	Is the CRC-16 value calculated over the manifest file inside the SAFE Package (4 characters).

4.2.1.2. URN Specifications

Representation Information Metadata package
urn:x-safe:JERS:JSA_OPS_0P_RPI-MTD
Representation Information Data package
urn:x-safe:JERS:JSA_OPS_0P_RPI-DAT
Naming convention for collection package
urn:x-safe:JERS:JSA_OPS_0P_COL-MTD
Naming convention for product packages
urn:x-safe:JERS:JSA_OPS__0P_<*start*>_<*stop*>_<*procCenter*>_<*orbit*>_<*nnnn*>

Table 15: URN Specification for JERS OPS L0 packages

Appendix A. Representation Information Packages

SAFE Representation Information Packages are characteristic of the specialisation and during the nominal operations of a SAFE archive such Packages will not normally be created. Therefore, the packages listed in the following sections can be used as-is to introduce JERS support to a SAFE archive.

A.I. Rep. Info Packages for Level 0 products

The files listed below are distributed together with the set of documents that constitute the SAFE specialisation for JERS L0. Each SAFE Package is compressed into a zip file which should be decompressed before usage.

These SAFE Packages may contain either the representation information of the target of preservation EO product (RPI-DAT) or the representation information of the metadata (RPI-MTD) for the product types.

[JERS-BOOK-L0] provides a detailed description of those schemas (stored in the RPI-DAT packages) describing the data structure of the target of preservation.

#	Filename
1	JSA_RAW_0P_RPI-DAT_4987.SAFE.zip
2	JSA_RAW_0P_RPI-MTD_3741.SAFE.zip
3	JSA_OPS_0P_RPI-DAT_1925.SAFE.zip
4	JSA_OPS_0P_RPI-MTD_3219.SAFE.zip

Appendix B. SAFE Package Examples

The packages listed in the following subsections are examples of SAFE JERS EO Product distributed only for illustrative purposes together with the set of documents that constitute the SAFE specialisation for JERS.

Each SAFE Package is compressed into a zip file which should be decompressed before usage.

B.I. SAFE Package examples for L0

#	Filename
1	JSA_RAW_0P_19940210T142753_19940210T143548_MTI_11054_0002_1955.SAFE.zip
2	JSA_OPS_0P_19970501T090133_20061022T192414_FCI_28664_3224_2675.SAFE.zip

Appendix C. Acquisition stations

In the following table the list of JERS Acquisition stations are reported.

Station name	2-char station code	3-char station code
Fairbanks	AF	ASF
AliceS pring	AS	ASA
Atlanta Test Site	AT	ATL
Beijing	BJ	BJG
Bishkek	BK	BSK
Cordoba	CA	COA
Cachoeira Paulista	CP	CPA
Chetumal	CM	MEX
Cotopaxi	CO	CPE
Cuiaba	CU	CUB
Fucino	FS	FUI
Gatineau	GH	GAT
Grimstadt	GR	GRS
Hatoyama	HA	HAJ
Hyderabad – former Shadnadar	SE	HYD
Hobart	HO	HOA
Hawaii	HW	HW
Hyderabad	HY	HYD
PariPari	IN	DKI
TelAviv (IR)	IR	ISR
Johannesburg	JO	JOS
Kitab	KB	KTB
Khanty Mansisk	KM	KMY
Kiruna	KS	KIR
Kumamoto	KU	KUJ
Libreville	LI	LBG
Matera	MA	MTI
Miami	MI	MIM
Malindi	ML	MLD
McMurdo	MM	MMR

Station name	2-char station code	3-char station code
Maspalomas	MS	MPS
Moscow	MW	MSW
Norman	NO	NOM
Neustrelitz	NZ	NSG
O'Higgins	OH	OHG
PrinceAlbert	PH	PAS
Rhyad	SA	RSA
Singapore	SG	SGP
Syowa	SY	SYW
O'Higgins	TF	OHG
Bangkok	TH	BKT
Taipei (Taiwan)	TP	TPE
Tromsoe	TS	TRS
Istanbul	TU	IST
Chung-Li (Taiwan)	TW	TWN
Ulan Bator	UB	ULB
UNKNOWN	XX	XXX
West Freugh	WF	WFR