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Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for Common Geolocation and Spacecraft Orientation

NOAA / NASA

Goddard Space Flight Center Greenbelt, Maryland

Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for Common Geolocation and Spacecraft Orientation

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Preface

This document is under JPSS Ground Segment (GS) configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

Any questions should be addressed to:

JPSS Configuration Management Office
NASA/GSFC
Code 474
Greenbelt, MD 20771

Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
Rev-	Aug. 29, 2013	This version incorporates 474-CCR-13-1193 which was approved by JPSS Ground ERB on the effective date shown.
A	Jan 30, 2014	This version incorporates 474-CCR-13-1403 which was approved by JPSS Ground ERB on the effective date shown.
A1	Oct 23, 2014	This version incorporates 474-CCR-14-2091 which was approved by the JPSS Ground ERB for CO10 on the effective date shown.
B	Oct 07, 2014	This version incorporates 474-CCR-14-1721, 474-CCR-14-1741, 474-CCR-14-1781, 474-CCR-14-1793 and 474-CCR-14-2012 which was approved by JPSS Ground ERB on the effective date shown.
C	Nov 17, 2015	This version incorporates 474-CCR-14-2110, 474-CCR-15-2452 and 474-CCR-15-2480, 474-CCR-15-2657 and 474-CCR-15-2689 which was approved by JPSS Ground ERB on the effective date shown.
0200D	Sep 22, 2016	This version incorporates 474-CCR-16-2939 and 474-CCR-16-3049 which was approved by JPSS Ground ERB on the effective date shown.
0200E	Feb 09, 2018	This version incorporates 474-CCR-18-3822 which was approved by JPSS Ground ERB on the effective date shown.
F	Dec 14, 2018	This version incorporates 474-CCR-18-4203. This version incorporates 0220B of 474-00448-01-08-B0220, dated 06/14/2018 to create this baseline. This was approved by the JPSS Ground ERB on the effective date shown.
G	Oct 24, 2019	This version incorporates 474-CCR-19-4584 which was approved by the JPSS Ground ERB on Oct 17, 2019 and by the JPSS Ground Segment CCB on the effective date shown.
H	Apr 30, 2020	This version incorporates 474-CCR-19-4697 which was approved by the JPSS Ground ERB on Nov 26, 2019 and by the JPSS Ground Segment CCB on Dec 05, 2019, 474-CCR-4719 approved by JPSS Ground ERB on Mar 11, 2020 and by the JPSS Ground Segment CCB on Mar 26, 2020, 474-CCR-20-4973 approved by the JPSS Ground ERB on Apr 21, 2020 and by the JPSS Ground Segment CCB on the effective date shown.
I	Sep 14, 2020	This version incorporates 474-CCR-20-5127 which was approved by the JPSS Ground ERB on Jul 24, 2020 and by

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
		the JPSS Ground Segment CCB on Jul 30, 2020; 474-CCR-20-4960 which was approved by the JPSS Ground ERB on Apr 22, 2020 and by the JPSS Ground Segment CCB on the effective date shown.
J	Mar 09, 2021	This version incorporates 474-CCR-21-5418 which was approved by the JPSS Ground ERB on Mar 09, 2021 and by the JPSS Ground Segment CCB on the effective date shown.
K	Aug 26, 2021	This version incorporates 474-CCR-21-5445 which was approved by the JPSS Ground ERB on May 07, 2021 and by the JPSS Ground Segment CCB on the effective date shown.
L	Jan 06, 2022	This version incorporates 474-CCR-21-5395 which was approved by the JPSS Ground ERB on June 25, 2021 and by the JPSS Ground Segment CCB on the effective date shown.
M	Mar 31, 2022	This version incorporates 474-CCR-22-5924 which was approved by the JPSS Ground ERB on March 23, 2022 and by the JPSS Ground Segment CCB on the effective date shown.

Table of Contents

List of Figures

List of Tables

1 INTRODUCTION

The Joint Polar Satellite System (JPSS) is the National Oceanic and Atmospheric Administration's (NOAA) next-generation operational Earth observation program that acquires and distributes global environmental data primarily from multiple polar-orbiting satellites. The program plays a critical role in NOAA's mission to understand and predict changes in weather, climate, oceans and coasts, and the space environment, which support the Nation's economy and protect lives and property. For information regarding the JPSS Program, missions, instruments, and partners, see the JPSS website at https://www.jpss.noaa.gov/.

1.1 Identification

This volume documents the common software used in the various Sensor Data Record (SDR) geolocation algorithms. It also documents the spacecraft diary and telemetry Raw Data Records (RDRs).

1.2 Algorithm Overview

This volume covers general geolocation requirements and the spacecraft RDRs. Specific geolocation requirements are found within appropriate volumes for the SDRs, VIIRS Imagery for NCC Geo and GTM Geo, Surface Albedo for Net Heat Flux Geo, Cloud Physical Properties for VIIRS Cloud Aggregated Geo, and Aerosols for the Aerosols Geo.

The geolocation algorithm comprises 2 parts: (1) the instrument specific algorithm where the exit vector (or Line-Of-Sight (LOS)) is calculated with respect to the instrument frame, and (2) the common geolocation algorithm that takes the LOS and calculate the interception with the Earth ellipsoid by taking into account the satellite ephemeris and attitude.

1.3 Document Overview

Section	Description
Section 1	Introduction - Provides a brief overview of the JPSS Ground System and the relevant algorithm, as reference material only.
Section 2	Related Documentation - Lists related documents and identifies them as Parent, Applicable, or Information Documents such as, MOAs, MOUs, technical implementation agreements, as well as Data Format specifications. This section also establishes an order of precedence in the event of conflict between two or more documents.
Section 3	Algorithm Requirements - Provides a summary of the science requirements for the products covered by this volume.
Appendix A	Requirements Attributes - Provides the mapping of requirements to verification methodology and attributes.

2 RELATED DOCUMENTATION

The latest JPSS documents can be obtained from URL: https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm. JPSS Project documents have a document number starting with 470, 472 or 474 indicating the governing Configuration Control Board (CCB) (Program, Flight, or Ground) that has the control authority of the document.

2.1 Parent Documents

The following reference documents are the Parent Documents from which this document has been derived. Any modification to a Parent Document will be reviewed to identify the impact upon this document. In the event of a conflict between a Parent Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
474-01541	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
474-01543	Joint Polar Satellite System (JPSS) Ground Segment Data Product Specification (GSegDPS)
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Common Algorithms

2.2 Applicable Documents

The following documents are the Applicable Documents from which this document has been derived. Any modification to an Applicable Document will be reviewed to identify the impact upon this document. In the event of conflict between an Applicable Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
474-00448-04-08	Joint Polar Satellite System (JPSS) Algorithm Specification Volume IV: Software Requirements Specification Parameter File (SRSPF) for the Common Geolocation and Spacecraft Orientation
474-00167	Joint Polar Satellite System (JPSS) Common Ground System (CGS) Requirements Document

3 ALGORITHM REQUIREMENTS

3.1 States and Modes

3.1.1 Normal Mode Performance

SRS.01.08_280 The Common Ground System shall provide the spacecraft diary, when available from the Spacecraft, within 30 seconds of the instrument data for a given data product.

Rationale: Level 1 requirements can't be met with TLE, and IDPS uses TLE if diary does not arrive within 30 seconds of the instrument data. This requirement is subject to the data availability requirements of the JPSS CGSRD (474-00167).

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

3.1.2 Graceful Degradation Mode Performance

SRS.01.08_278 The Geolocation software shall use two-line element sets for spacecraft ephemeris information when spacecraft diary ephemeris and attitude data are missing for a configurable amount of time.

Rationale: If a gap in spacecraft diary data exists for a length of time such that it is not efficient to interpolate data, an alternate data source must be used to obtain ephemeris information. The TLE data is used as a fall-back data when spacecraft diary is missing. Level 1 requirements can't be met with TLE, and IDPS uses TLE if diary is not available for a configurable amount of time.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

3.2 Algorithm Functional Requirements

3.2.1 Product Production Requirements

Not applicable.

3.2.2 Algorithm Science Requirements

Not applicable.

3.2.3 Algorithm Exception Handling

Not applicable.

3.3 External Interfaces

3.3.1 Inputs

Table 3-1 and Figure 3-1 are best viewed together since they describe the processes governed by this SRS in different ways. The figure diagrams the data flowing into, out of, and within the code governed by this SRS. The table lists these same data interactions as well as all downstream dependencies for outputs from this SRS.

Each row in the table describes a single software interaction - data flowing from one software item to another. The data is listed in the first column. The second and third columns include the collection short name and mnemonic for the data. Blanks indicate there is no mnemonic. The columns for Sending SRS and Receiving SRS contain the SRS that generates the data product(s) in the first column, and the SRS that receives those products. The columns for Producing Function and Consuming Function contain the actual function name in Algorithm Development Library (ADL) that produces those products, and the function that inputs those products. The SRS's titled "Ingest MSD" and "Store/Retrieve" are non-existent SRS's functioning as data handling for the IDPS. The software functions "Store Products" and "Retrieve Products" are similar non-existent functions that operate as IDPS data handling.

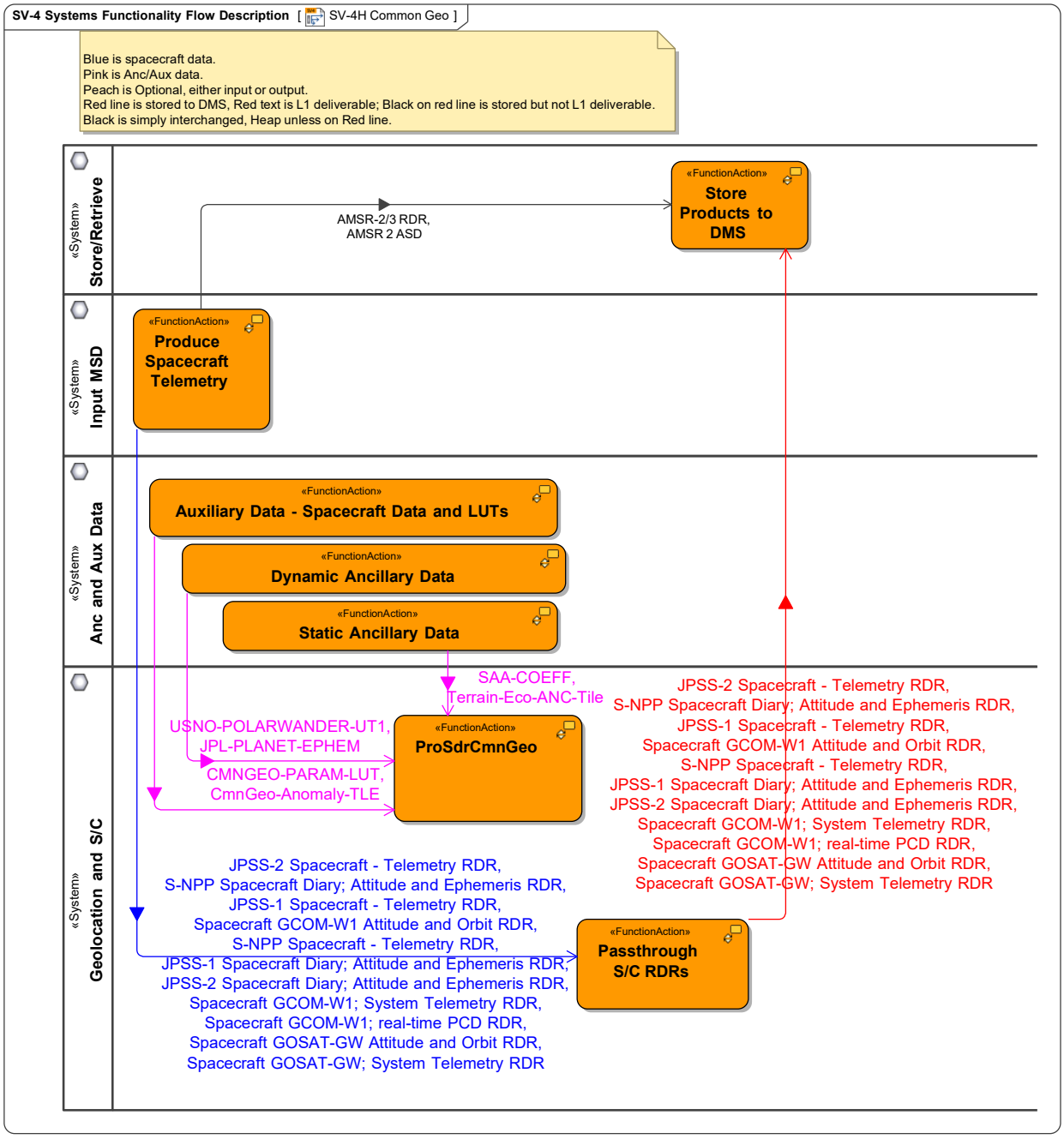

Figure: 3-1 Common Geolocation and Spacecraft Orientation Data Flows

Table: 3-1 Systems Resource Flow Matrix: Common Geolocation and Spacecraft Orientation

Resource Interaction Item	Collection Short Name	Mnemonic	Producing Function	Consuming Function	Sending SRS	Receiving SRS
• Spacecraft GCOM-W1; System Telemetry RDR • Spacecraft GCOM-W1; real-time PCD RDR • JPSS-1 Spacecraft - Telemetry RDR • NPP Spacecraft - Telemetry RDR • NPP Spacecraft Diary; Attitude and Ephemeris RDR • JPSS-1 Spacecraft Diary; Attitude and Ephemeris RDR • Spacecraft GCOM-W1 Attitude and Orbit RDR • JPSS-2 Spacecraft Diary; Attitude and Ephemeris RDR • JPSS-2 Spacecraft - Telemetry RDR • Spacecraft GOSAT-GW;	• SPACECRAFT-SYSTM-RDR • SPACECRAFT-RTPCD-RDR • SPACECRAFT-TELEMETRY-RDR • SPACECRAFT-TELEMETRY-RDR • SPACECRAFT-DIARY-RDR • SPACECRAFT-DIARY-RDR • SPACECRAFT-ATTORBIT-RDR • SPACECRAFT-DIARY-RDR • SPACECRAFT-TELEMETRY-RDR • SPACECRAFT-SYSTM-RDR • SPACECRAFT-RTPCD-RDR • SPACECRAFT-ATTORBIT-RDR	• RDRE-SCGW-C0033 • RDRE-SCGW-C0034 • RDRE-SCTN-C0031 • RDRE-SCTP-C0031 • RDRE-SCAE-C0030 • RDRE-SCAE-C0031 • RDRE-SCGW-C0035 • RDRE-SCAE-C0032 • RDRE-SCTN-C0032 • RDRE-SCGG-C0036 • RDRE-SCGG-C0037	Produce Spacecraft Telemetry	Passthrough S/C RDRs	Input MSD	Common Geolocation and S/C

Resource Interaction Item	Collection Short Name	Mnemonic	Producing Function	Consuming Function	Sending SRS	Receiving SRS
System Telemetry RDR • Spacecraft GOSAT-GW Attitude and Orbit RDR						
• USNO-Polarwander-UT1 • JPL-Planet-Ephem	• USNO-PolarWander-UT1-ANC • Planet-Eph-ANC	• AN_NP-L10330-003 • AN_NP-L10340-001	Dynamic Ancillary Data	ProSdrCmnGeo	Anc and Aux Data	Common Geolocation and S/C
• CmnGeo-Param-LUT • CmnGeo-Anomaly_TLE	• CMNGEO-PARAM-LUT • TLE-AUX-Int	• NP_NU-LM0233-215 • None	Auxiliary Data - Spacecraft Data and LUTs	ProSdrCmnGeo	Anc and Aux Data	Common Geolocation and S/C
• Terrain-Eco-ANC-Tile • SAA-Coeff	• Terrain-Eco-ANC-Tile • CmnGeo-SAA-AC	• AN_NP-L10100-003	Static Ancillary DataDynamic Ancillary Data	ProSdrCmnGeo	Anc and Aux Data	Common Geolocation and S/C
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrOmpsNpEarth	Common Geolocation and S/C	OMPS NP RDR/SDR
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrOmpsNpCal	Common Geolocation and S/C	OMPS NP RDR/SDR
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrOmpsTcEarth	Common Geolocation and S/C	OMPS TC RDR/SDR
• Common Geo Outputs	• None	• •None	ProSdrCmnGeo	ProSdrOmpsTcCal	Common Geolocation and S/C	OMPS TC RDR/SDR
• Common Geo Outputs	• None	• •None	ProSdrCmnGeo	ProSdrAtmsRemap	Common Geolocation and S/C	ATMS RDR/SDR/TDR
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrCris	Common Geolocation and S/C	CrIS RDR/SDR

Resource Interaction Item	Collection Short Name	Mnemonic	Producing Function	Consuming Function	Sending SRS	Receiving SRS
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrAtms	Common Geolocation and S/C	ATMS RDR/SDR/TDR
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrViirsCal	Common Geolocation and S/C	VIIRS RDR/SDR
• Common Geo Outputs	• None	• None	ProSdrCmnGeo	ProSdrViirsGeo	Common Geolocation and S/C	VIIRS RDR/SDR
• Spacecraft GCOM-W1; System Telemetry RDR • Spacecraft GCOM-W1; real-time PCD RDR • JPSS-1 Spacecraft - Telemetry RDR • NPP Spacecraft - Telemetry RDR • NPP Spacecraft Diary; Attitude and Ephemeris RDR • JPSS-1 Spacecraft Diary; Attitude and Ephemeris RDR • Spacecraft GCOM-W1 Attitude and Orbit RDR • JPSS-2 Spacecraft Diary;	• SPACECRAFT-SYSTM-RDR • SPACECRAFT-RTPCD-RDR • SPACECRAFT-TELEMETRY-RDR • SPACECRAFT-TELEMETRY-RDR • SPACECRAFT-DIARY-RDR • SPACECRAFT-DIARY-RDR • SPACECRAFT-ATTORBIT-RDR • SPACECRAFT-DIARY-RDR • SPACECRAFT-TELEMETRY-RDR • SPACECRAFT-SYSTM-RDR • SPACECRAFT-RTPCD-RDR • SPACECRAFT-ATTORBIT-RDR	• RDRE-SCGW-C0033 • RDRE-SCGW-C0034 • RDRE-SCTN-C0031 • RDRE-SCTP-C0031 • RDRE-SCAE-C0030 • RDRE-SCAE-C0031 • RDRE-SCGW-C0035 • RDRE-SCAE-C0032 • RDRE-SCTN-C0032 • RDRE-SCGG-C0036 • RDRE-SCGG-C0037	Passthrough S/C RDRs	Store Products to DMS	Common Geolocation and S/C	Store/Retrieve

Resource Interaction Item	Collection Short Name	Mnemonic	Producing Function	Consuming Function	Sending SRS	Receiving SRS
Attitude and Ephemeris RDR • JPSS-2 Spacecraft - Telemetry RDR • Spacecraft GOSAT-GW; System Telemetry RDR • Spacecraft GOSAT-GW 1 Attitude and Orbit RDR						

3.3.2 Outputs

SRS.01.08_272 The JPSS RDR software shall generate the JPSS-1 Telemetry RDR for health and status data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><JPSS-1_Telemetry>.

Rationale: Spacecraft telemetry RDR is produced from established APIDs for the spacecraft health and status.

Mission Effectivity: JPSS-1

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_283 The JPSS RDR software shall generate the JPSS-2 Telemetry RDR for health and status data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><JPSS-2_Telemetry>.

Rationale: Spacecraft telemetry RDR is produced from established APIDs for the spacecraft health and status.

Mission Effectivity: JPSS-2

Block Start: 2.2.0 *Block End:* 3.0.0

SRS.01.08_273 The JPSS RDR software shall generate the JPSS-1 Spacecraft Diary RDR for spacecraft attitude and ephemeris data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><JPSS-1_Diary>.

Rationale: APIDs 0, 8, and 11 are part of the Spacecraft Diary which is included in the deliverable RDR.

Mission Effectivity: JPSS-1

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_438 The JPSS RDR software shall generate the JPSS-2 Spacecraft Diary RDR for spacecraft attitude and ephemeris data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><JPSS-2_Diary>.

Rationale: Spacecraft diary RDR is produced from established APIDs for the spacecraft attitude and ephemeris.

Mission Effectivity: JPSS-2

Block Start: 2.2.0 *Block End:* 3.0.0

SRS.01.08_274 The S-NPP RDR software shall generate the S-NPP Telemetry RDR for health and status data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><S-NPP_Telemetry>.

Rationale: Spacecraft telemetry RDR is produced from established APIDs for the spacecraft health and status.

Mission Effectivity: S-NPP

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_275 The S-NPP RDR software shall generate the S-NPP Spacecraft Diary RDR for spacecraft attitude and ephemeris data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><S-NPP_Diary>.

Rationale: APIDs 0, 8, and 11 are part of the Spacecraft Diary which is included in the deliverable RDR.

Mission Effectivity: S-NPP

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_276 The GCOM-W RDR software shall generate the GCOM-W System Telemetry RDR for health and status data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><GCOM-W_Telemetry>.

Rationale: APID 1281 is included in the deliverable RDR.

Mission Effectivity: GCOM-W1

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_454 The GOSAT-GW RDR software shall generate the GOSAT-GW System Telemetry RDR for health and status data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR>< GOSAT-GW_Telemetry>.

Rationale: APID TBD is included in the deliverable RDR.

Mission Effectivity: GOSAT-GW

Block Start: 2.5.0 *Block End:* 3.0.0

SRS.01.08_439 The GCOM-W RDR software shall generate the GCOM-W Real-time PCD RDR for Real-time PCD Supplemental data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><GCOM-W_PCD_Supplemental>.

Rationale: APID 1550 is included in the deliverable RDR.

Mission Effectivity: GCOM-W1

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_277 The GCOM-W1 RDR software shall generate the GCOM-W1 Spacecraft Attitude and Orbit RDR for spacecraft attitude and orbit data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><GCOM_Diary>.

Rationale: APID 1549 is included in the deliverable RDR.

Mission Effectivity: GCOM-W1

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.08_456 The GOSAT-GW RDR software shall generate the GOSAT-GW Spacecraft Attitude and Orbit RDR for spacecraft attitude and orbit data from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Common Geolocation and Spacecraft Orientation (474-00448-04-08) <RDR><GOSAT_Diary>.

Rationale: APID TBD is included in the deliverable RDR.

Mission Effectivity: GOSAT-GW

Block Start: 2.5.0 *Block End:* 3.0.0

3.4 Science Standards

Not applicable.

3.5 Metadata Output

Not applicable.

3.6 Quality Flag Content Requirements

Not applicable.

3.7 Data Quality Notification Requirements

Not applicable.

3.8 Adaptation

Not applicable.

3.9 Provenance Requirements

Not applicable.

3.10 Computer Software Requirements

Not applicable.

3.11 Software Quality Characteristics

Not applicable.

3.12 Design and Implementation Constraints

Not applicable.

3.13 Personnel Related Requirements

Not applicable.

3.14 Training Requirements

Not applicable.

3.15 Logistics Related requirements

Not applicable.

3.16 Other Requirements

Not applicable.

3.17 Packaging Requirements

Not applicable.

3.18 Precedence and Criticality

Not applicable.

3.19 Historical Requirements

SRS.01.08_434 The Common Geolocation algorithm computation shall have a numerical 3-sigma mapping uncertainty of no larger than 10 m when calculating the earth intersection point of an exit vector.

Rationale: The geolocation needs sufficient mapping certainty to meet L1 requirements. This requirement applies to the VIIRS sensor footprint exit vector.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.08_267 The Geolocation software shall incorporate a computing algorithm provided for establishing the earth intersect point for a given spacecraft exit vector.

Rationale: Algorithms are established in accordance with D0001-M01-S01-004, ATBD for VIIRS Geolocation.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.08_268 The Geolocation software shall incorporate a computing algorithm provided for establishing the spacecraft exit vector for a given instrument exit vector.

Rationale: Algorithms are established in accordance with D0001-M01-S01-004, ATBD for VIIRS Geolocation.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.08_269 The Geolocation software shall incorporate a computing algorithm provided for establishing the earth intersection of the exit vector relative to the ellipsoid as defined in WGS 84 geodetic reference system.

Rationale: Algorithms are established in accordance with D0001-M01-S01-004, ATBD for VIIRS Geolocation, which uses WGS 84 geodetic reference system.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.08_270 The Geolocation software shall incorporate a computing algorithm provided for establishing the terrain-corrected earth intersection point of the exit vector.

Rationale: Algorithms are established in accordance with D0001-M01-S01-004, ATBD for VIIRS Geolocation.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.08_271 The Geolocation software shall incorporate a computing algorithm provided for interpolating spacecraft orientation and ephemeris for all pixels reported in data products.

Rationale: Algorithms are established in accordance with D0001-M01-S01-004, ATBD for VIIRS Geolocation.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

Appendix A. Requirements Attributes

The Requirements Attributes can be found in the VCRMs at Ground > Mission System Engineering > Ground SEIT Unrestricted > VCRM

https://jpss.gsfc.nasa.gov/sites/ground/MSE/9/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fground%2FMSE%2F9%2FVCRM&FolderCTID=0x012000D0555EA1A211E64A9A7DE7CBCE72DE8B&View=%7B4267AEFE%2D7E8B%2D402D%2D919D%2D41BED55BA4E7%7D