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Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for the VIIRS RDR/SDR

NOAA / NASA

Goddard Space Flight Center Greenbelt, Maryland

Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for the VIIRS RDR/SDR

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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 -	July 26, 2013	This version incorporates 474-CCR-13-1104 which was approved by the JPSS Ground ERB on the effective day shown.
A	Jan 16, 2014	This version incorporates 474-CCR-13-1336 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	Jan 21, 2015	This version incorporates 474-CCR-14-1721, 474-CCR-14-1741, 474-CCR-14-1781, 474-CCR-14-2110 and 474-CCR-14-2203 which was approved by JPSS Ground ERB on the effective date shown.
C	Jul 23, 2015	This version incorporates 474-CCR-15-2452, 474-CCR-15-2480 and 474-CCR-15-2434 which was approved by JPSS Ground ERB on the effective date shown.
D	Aug 17, 2015	This version incorporates 474-CCR-15-2523 which was approved by JPSS Ground ERB on the effective date shown.
E	Feb 12, 2016	This version incorporates 474-CCR-15-2657 and 474-CCR-16-2768 which was approved by JPSS Ground ERB on the effective date shown.
0200F	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.
0200G	Feb 09, 2018	This version incorporates 474-CCR-18-3822 which was approved by JPSS Ground ERB on the effective date shown.
H	Dec 14, 2018	This version incorporates 474-CCR-18-4203. This version incorporates 0220A of 474-00448-01-06-B0220, dated 11/29/2016 to create this baseline. This was approved by the JPSS Ground ERB on the effective date shown.
I	Oct 24, 2019	This version incorporates 474-CCR-19-4497 which was approved by the JPSS Ground ERB on Jun 11, 2019 and by the JPSS Ground Segment CCB on September 26, 2019; 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.
J	Sep 14, 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 5, 2019; 474-CCR-19-4719 which was approved by the JPSS Ground ERB on Mar 11, 2020 and by the JPSS Ground Segment CCB on Mar 26, 2020; 474-CCR-20-5127 which was approved by the JPSS Ground ERB on Jul 24, 2020 and by the JPSS Ground Segment CCB on Jul 27, 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.
K	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.
L	Aug 26, 2022	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.

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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 SRS provides requirements for the Visible Infrared Imaging Radiometer Suite (VIIRS) Raw Data Records (RDRs) and Sensor Data Records (SDRs). VIIRS is a scanning radiometer that provides top-of-atmosphere radiances and reflectances at a range of visible and infrared frequencies. The telescope rotates from scan to scan, including calibration measurements of a blackbody, a solar diffuser, and cold space. There are 16 moderate-resolution M bands which provide 750 meter resolution, and 5 imagery-resolution I bands which provide 375 m resolution. There is also a CCD sensor for the day-night band (DNB). The bands are dominated by either reflection of solar radiation, or by thermal emission. The reflective M bands M1-M11 span 412-2250 nanometers (nm), and the reflective I bands I1-I3 span 640-1610 nm. The emissive M bands M12-M16 span 3700-12013 nm, and the emissive I bands I4-I5 span 3740-11450 nm. A sub-pixel aggregation scheme is used to maintain near-constant spatial resolution along scan. The swath width is 3040 km, with an along-track width of 12 km at nadir, and 26 km at edge of scan.

1.2 Algorithm Overview

Each of the VIIRS SDR products described in this document is necessary as an input to one or more of the VIIRS EDR algorithms. All VIIRS EDR algorithms use these data either directly or indirectly. These SDR products form the link between instrument measurements reported as digital counts and the collected photons at the instrument’s aperture. Collected photons relate to radiance fields at the top of the atmosphere, which in turn are related via the EDR algorithms to surface and/or atmospheric properties.

In terms of radiometric calibration VIIRS has specific requirements in the areas of dynamic range, signal-to-noise ratio (SNR), and radiometric accuracy. In general these requirements are specified separately for reflective solar bands, thermal emissive bands, and the DNB. In order to have radiances that are within the required dynamic ranges for the VIIRS SDRs (and in most cases to avoid saturation while viewing earth), VIIRS is required to have the dynamic range. For reflective bands with multiple gain states, the gain switching will occur at the radiance levels within the tolerance of +10% and -0%. For emissive band with multiple gain states, M13, the gain switching will occur at the brightness temperature with a tolerance of +0.3 K and -0.0 K. The dynamic range of the panchromatic DNB is 3.0E-9 W cm-2 sr-1 to at least 2.0E-2 W cm-2 sr-1.

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
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification 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
474-00448-02-06	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for VIIRS RDR/SDR
474-00448-04-06	Joint Polar Satellite System (JPSS) Algorithm Specification Volume IV: Software Requirements Specification Parameter File (SRSPF) for VIIRS RDR/SDR
474-00448-04-08	JPSS Algorithm Specification Volume IV: Software Requirements Specification Parameter File (SRSPF) for the Geolocation and Spacecraft Orientation

3 ALGORITHM REQUIREMENTS

3.1 States and Modes

3.1.1 Normal Mode Performance

SRS.01.06_71 The VIIRS DNB SDR top-of-atmosphere radiance algorithm shall calculate the top-of-atmosphere radiance with an accuracy of 5% for low-gain.

Rationale: The radiance accuracy values were flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_959 The VIIRS DNB SDR top-of-atmosphere radiance algorithm shall calculate the top-of-atmosphere radiance with an accuracy of 10% for mid-gain.

Rationale: The radiance accuracy values were flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_960 The VIIRS DNB SDR top-of-atmosphere radiance algorithm shall calculate the top-of-atmosphere radiance with an accuracy of 30% for high-gain.

Rationale: The radiance accuracy values were flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_99 The VIIRS Reflective I-band SDR top-of-atmosphere reflectance algorithm shall calculate the I1 top-of-atmosphere reflectance to an accuracy of 2% at 22 W m^-2 sr^-1 μm^-1.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_941 The VIIRS Reflective I-band SDR top-of-atmosphere reflectance algorithm shall calculate the I2 top-of-atmosphere reflectance to an accuracy of 2% at 25 W m^-2 sr^-1 μm^-1.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_942 The VIIRS Reflective I-band SDR top-of-atmosphere reflectance algorithm shall calculate the I3 top-of-atmosphere reflectance to an accuracy of 2% at 7.3 W m^-2 sr^-1 μm^-1.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_134 The VIIRS Emissive I-band SDR top-of-atmosphere radiance algorithm shall calculate the I4-band top-of-atmosphere radiance to an accuracy of 5% at 267 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_381 The VIIRS Emissive I-band SDR top-of-atmosphere radiance algorithm shall calculate the I5-band top-of-atmosphere radiance to an accuracy of 2.5% at 267 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_167 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M1 top-of-atmosphere reflectance to an accuracy of 2% at 44.9 W m^-2 sr^-1 μm^-1 for high gain and 2% at 155 W m^-2 sr^-1 μm^-1 for low gain for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_943 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M2 top-of-atmosphere reflectance to an accuracy of 2% at 40 W m^-2 sr^-1 μm^-1 for high gain and 2% at 146 W m^-2 sr^-1 μm^-1 for low gain for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_944 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M3 top-of-atmosphere reflectance to an accuracy of 2% at 32 W m^-2 sr^-1 μm^-1 for high gain and 2% at 123 W m^-2 sr^-1 μm^-1 for low gain for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_945 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M4 top-of-atmosphere reflectance to an accuracy of 2% at 21 W m^-2 sr^-1 μm^-1 for high gain and 2% at 90 W m^-2 sr^-1 μm^-1 for low gain for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_946 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M5 top-of-atmosphere reflectance to an accuracy of 2% at 10 W m^-2 sr^-1 μm^-1 for high gain and 2% at 68 W m^-2 sr^-1 μm^-1 for low gain for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_947 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M6 top-of-atmosphere reflectance to an accuracy of 2% at 9.6 W m^-2 sr^-1 μm^-1 for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_948 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M7 top-of-atmosphere reflectance to an accuracy of 2% at 6.4 W m^-2 sr^-1 μm^-1 for high gain and 2% at 33.4 W m^-2 sr^-1 μm^-1 for low gain for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_949 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M8 top-of-atmosphere reflectance to an accuracy of 2% at 5.4 W m^-2 sr^-1 μm^-1.3 for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_950 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M9 top-of-atmosphere reflectance to an accuracy of 2% at 6 W m^-2 sr^-1 μm^-1 for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_951 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M10 top-of-atmosphere reflectance to an accuracy of 2% at 7.3 W m^-2 sr^-1 μm^-1 for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_952 The VIIRS Reflective M-band SDR top-of-atmosphere reflectance algorithm shall calculate the M11 top-of-atmosphere reflectance to an accuracy of 2% at 0.12 W m^-2 sr^-1 μm^-1 for an unpolarized, no contrast scene.

Rationale: The reflectance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_202 The VIIRS Emissive M-band SDR top-of-atmosphere radiance algorithm shall calculate the M12-band top-of-atmosphere radiance to an accuracy of 0.7% at 270 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_953 The VIIRS Emissive M-band SDR top-of-atmosphere radiance algorithm shall calculate the M13-band top-of-atmosphere radiance to an accuracy of 0.7% at 270 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_388 The VIIRS Emissive M-band SDR top-of-atmosphere radiance algorithm shall calculate the M14-band top-of-atmosphere radiance to an accuracy of 0.6% at 270 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_389 The VIIRS Emissive M-band SDR top-of-atmosphere radiance algorithm shall calculate the M15-band top-of-atmosphere radiance to an accuracy of 0.4% at 270 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_954 The VIIRS Emissive M-band SDR top-of-atmosphere radiance algorithm shall calculate the M16-band top-of-atmosphere radiance to an accuracy of 0.4% at 270 K.

Rationale: The radiance accuracy was flowed down from the Level 1 and Level 2 documents.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_955 The VIIRS M-band SDR software shall provide a field-of-view at nadir of 0.75 km.

Rationale: The M-band field of view value is consistent with the instrument spec and maintains compliance to Level 1 and 2 specifications.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_956 The VIIRS M-band SDR software shall perform cross-track aggregation of calibrated samples for dual gain M-bands using the following aggregation factors: 3 for scan angle magnitude less than 31.59 degrees, 2 for scan angle magnitudes between 31.59 degrees and 44.82 degrees, and 1 for scan angle magnitude greater than 44.82 degrees.

Rationale: The cross-track aggregation factor for dual gain M-bands are performed on the ground at the SDR processing level and maintains the compliance to ground FOV values specified in the Level 1 and 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_248 The VIIRS SDR Geolocation software shall satisfy constraints specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Mband_GEO><Performance>.

Rationale: Geolocation parameters need to be provided for each M-band pixels including latitude, longitude, terrain height, pixel-to-sensor range, solar zenith/azimuth angles, satellite zenith/azimuth angles, and lunar zenith/azimuth angles in degrees.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_939 The VIIRS SDR Geolocation software shall satisfy constraints specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Iband_GEO><Performance>.

Rationale: Geolocation parameters need to be provided for each I-Band pixels including latitude, longitude, terrain height, pixel-to-sensor range, solar zenith/azimuth angles, satellite zenith/azimuth angles, and lunar zenith/azimuth angles in degrees.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_940 The VIIRS SDR Geolocation software shall satisfy constraints specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_GEO><Performance>.

Rationale: Geolocation parameters need to be provided for each DNB pixels including latitude, longitude, terrain height, pixel-to-sensor range, solar zenith/azimuth angles, satellite zenith/azimuth angles, and lunar zenith/azimuth angles in degrees.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1144 The VIIRS I-band SDR Terrain-corrected Geolocation algorithm computation shall have a 3-sigma mapping uncertainty at nadir of 1 km.

Rationale: Accuracy is derived from L1RD requirements for VIIRS Imagery EDR.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1145 The VIIRS I-band SDR Terrain-corrected Geolocation algorithm computation shall have a 3-sigma mapping uncertainty at edge of swath of 3 km.

Rationale: Accuracy is derived from L1RD requirements for VIIRS Imagery EDR.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1146 The VIIRS M-band SDR Terrain-corrected Geolocation algorithm computation shall have a 3-sigma mapping uncertainty at nadir of 1 km.

Rationale: Accuracy is derived from L1RD requirements for VIIRS Imagery EDR. Covers other EDRs using M-band GEO.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1147 The VIIRS M-band SDR Terrain-corrected Geolocation algorithm computation shall have a 3-sigma mapping uncertainty at edge of swath of 3 km.

Rationale: Accuracy is derived from L1RD requirements for VIIRS Imagery EDR.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1148 The VIIRS Day Night-band SDR Terrain-corrected Geolocation algorithm computation shall have a 3-sigma mapping uncertainty at nadir of 1 km.

Rationale: Accuracy is derived from L1RD requirements for VIIRS Imagery EDR.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1485 The VIIRS Day Night-band SDR Terrain-corrected Geolocation algorithm computation shall have a 3-sigma mapping uncertainty at edge of swath 3 km.

Rationale: Accuracy is derived from L1RD requirements for VIIRS Imagery EDR.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 2.0.0

3.1.2 Graceful Degradation Mode Performance

Not applicable.

3.2 Algorithm Functional Requirements

3.2.1 Product Production Requirements

Not applicable.

3.2.2 Algorithm Science Requirements

SRS.01.06_69 The VIIRS DNB SDR software shall incorporate a computing algorithm provided for calibrated, top of the atmosphere radiances.

Rationale: The VIIRS DNB is measured and calibrated in units of radiances, W/(sr-cm2). The VIIRS DNB SDR is computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.5.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_132 The VIIRS Emissive I-band SDR software shall incorporate a computing algorithm provided for calibrated top of atmosphere spectral radiances.

Rationale: The VIIRS Emissive I-band SDR is calibrated in units of spectral radiances, W/(sr-m2-um) and brightness temperature in Kelvin. The VIIRS Emissive I-Band SDRs are computed

in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.4.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_136 The VIIRS Emissive I-band SDR software shall incorporate a computing algorithm provided for calibrated top of atmosphere brightness temperatures.

Rationale: The VIIRS Emissive I-band SDR is calibrated in units of spectral radiances, W/(sr-m2-um) and brightness temperature in Kelvin. The VIIRS Emissive I-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.4.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_165 The VIIRS Reflective M-band SDR software shall incorporate a computing algorithm provided for calibrated top-of-atmosphere spectral radiances.

Rationale: The VIIRS Reflective M-band SDR is calibrated in units of spectral radiances, W/(sr-m2-um) and reflectance (unitless). The VIIRS Reflective M-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.3.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_169 The VIIRS Reflective M-band SDR software shall incorporate a computing algorithm provided for calibrated top-of-atmosphere reflectances.

Rationale: The VIIRS Reflective M-band SDR is calibrated in units of spectral radiances, W/(sr-m2-um) and reflectance (unitless). The VIIRS Reflective M-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.3.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_200 The VIIRS Emissive M-band SDR software shall incorporate a computing algorithm provided for calibrated top of atmosphere spectral radiances.

Rationale: The VIIRS Emissive M-band SDR is calibrated in units of spectral radiances, W/(sr-m2-um) and brightness temperature in Kelvin. The VIIRS Emissive M-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.4.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_204 The VIIRS Emissive M-band SDR software shall incorporate a computing algorithm provided for calibrated top of atmosphere brightness temperatures.

Rationale: The VIIRS Emissive M-band SDR is calibrated in units of spectral radiances, W/(sr-m2-um) and brightness temperature in Kelvin. The VIIRS Emissive M-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.4.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_233 The VIIRS Bright Pixel IP software shall incorporate a computing algorithm provided for determining bright pixels that may contaminate radiometric measurements from surrounding areas.

Rationale: Bright pixels that can potentially dominate or contaminate the radiometric uncertainty of nearby pixels need to be identified. This information can be used for the exclusion flags that can be used in the downstream processing.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_239 The VIIRS On-board Calibrator IP software shall extract a subset of the RDR data as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <OnBoardCalIP><subsetRDR>.

Rationale: RDR from On-board Calibrators such as engineering and housekeeping data from SDSM, and sensor calibrator view data from space, blackbody, and solar diffuser are used in radiometric calibration process for VIIRS bands.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_268 The VIIRS Calibrated Dual Gain Band IP software shall incorporate a computing algorithm provided for dual-gain band top-of-atmosphere radiances and reflectance values.

Rationale: The Calibrated Dual Gain IPs are delivered intermediate products and contain unaggregated, calibrated TOA radiances from those subpixel samples that were aggregated along-scan during post-calibration ground processing as specified by the requirement SRS.01.06_956.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_1152 The VIIRS RSB AutoCal software shall incorporate a computing algorithm provided for automated calibration of the VIIRS science data.

Rationale: The VIIRS RSB AutoCal History data is a delivered product and contains a history of the filtered calibration values computed for the instrument.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_97 The VIIRS Reflective I-band SDR software shall incorporate a computing algorithm provided for calibrated top-of-atmosphere spectral radiances.

Rationale: Spectral radiances are one of the Reflective I-band SDR products. The SDR software through its computing algorithm must be able to compute calibrated TOA spectral radiances for Reflective I-bands. The VIIRS Reflective I-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.3.

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

Block Start: 2.0.0 *Block End:* 2.0.0

SRS.01.06_101 The VIIRS Reflective I-band SDR software shall incorporate a computing algorithm provided for calibrated top-of-atmosphere reflectances.

Rationale: Reflectances are one of Reflective I-band SDR products. The SDR software through its computing algorithm must be able to compute calibrated TOA reflectances for Reflective I-bands. The VIIRS Reflective I-Band SDRs are computed in accordance with D0001-M01-S01-003, ATBD for VIIRS Radiometric Calibration, section 3.3.3.

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

Block Start: 2.0.0 *Block End:* 2.0.0

3.2.3 Algorithm Exception Handling

SRS.01.06_90 The VIIRS DNB SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_SDR><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS DNB values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_122 The VIIRS Reflective I-band SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_I1-3_SDR><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS Reflective I-band values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_157 The VIIRS Emissive I-band SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_I4-5_SDR><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS Emissive I-band values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_190 The VIIRS Reflective M-band SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_M1-11_SDR><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS Reflective M-band values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_225 The VIIRS Emissive M-band SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_M12-16_SDR><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS Emissive M-band values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_238 The VIIRS Bright Pixel IP software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <BrightPixelIP><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS Bright Pixel IP values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_249 The VIIRS SDR Geolocation software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Mband_GEO><fill>.

Rationale: The SDR Geolocation software through its computing algorithm must fill the VIIRS M-band geolocation values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_937 The VIIRS SDR Geolocation software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Iband_GEO><fill>.

Rationale: The SDR Geolocation software through its computing algorithm must fill the VIIRS I-band geolocation values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_938 The VIIRS SDR Geolocation software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_GEO><fill>.

Rationale: The SDR Geolocation software through its computing algorithm must fill the VIIRS DNB geolocation values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_269 The VIIRS Calibrated Dual Gain Band IP software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <CalDGB_IP><fill>.

Rationale: The SDR software through its computing algorithm must fill the VIIRS Calibrated Dual Gain Band IP values based on the established fill conditions to satisfy exclusion and fill conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

3.3 External Interfaces

3.3.1 Inputs

SRS.01.06_73 The VIIRS DNB SDR software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS DNB SDR products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_103 The VIIRS Reflective I-band SDR software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Reflective I-band SDR products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_138 The VIIRS Emissive I-band SDR software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Emissive I-band SDR products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_171 The VIIRS Reflective M-band SDR software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Reflective M-band SDR products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_206 The VIIRS Emissive M-band SDR software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Emissive M-band SDR products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_236 The VIIRS Bright Pixel IP software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Bright Pixel IP products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_241 The VIIRS On-board Calibrator IP software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS On-board Calibrator IP products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_961 The VIIRS Calibrated Dual Gain Band IP software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS Calibrated Dual Gain Band IP products.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_247 The VIIRS SDR Geolocation software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR geolocation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended VIIRS SDR geolocation products.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_1149 The VIIRS SDR software shall input tables and coefficients specified in Table 3-1 formatted in accordance with JPSS Algorithm Specification for VIIRS RDR/SDR Vol II - Data Dictionary (474-00448-02-06), Section 7.

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_1150 The VIIRS SDR geolocation software shall input tables and coefficients specified in Table 3-1 formatted in accordance with JPSS Algorithm Specification for VIIRS RDR/SDR Vol II - Data Dictionary (474-00448-02-06), Section 7.

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

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

Block Start: 2.0.0 *Block End:* 3.0.0

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 short name and mnemonic for the data. Blanks indicate there is no mnemonic. The fourth and fifth columns contain the SRS that generates the data product(s) in the first column, and the SRS that receives those products. The final two columns 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.

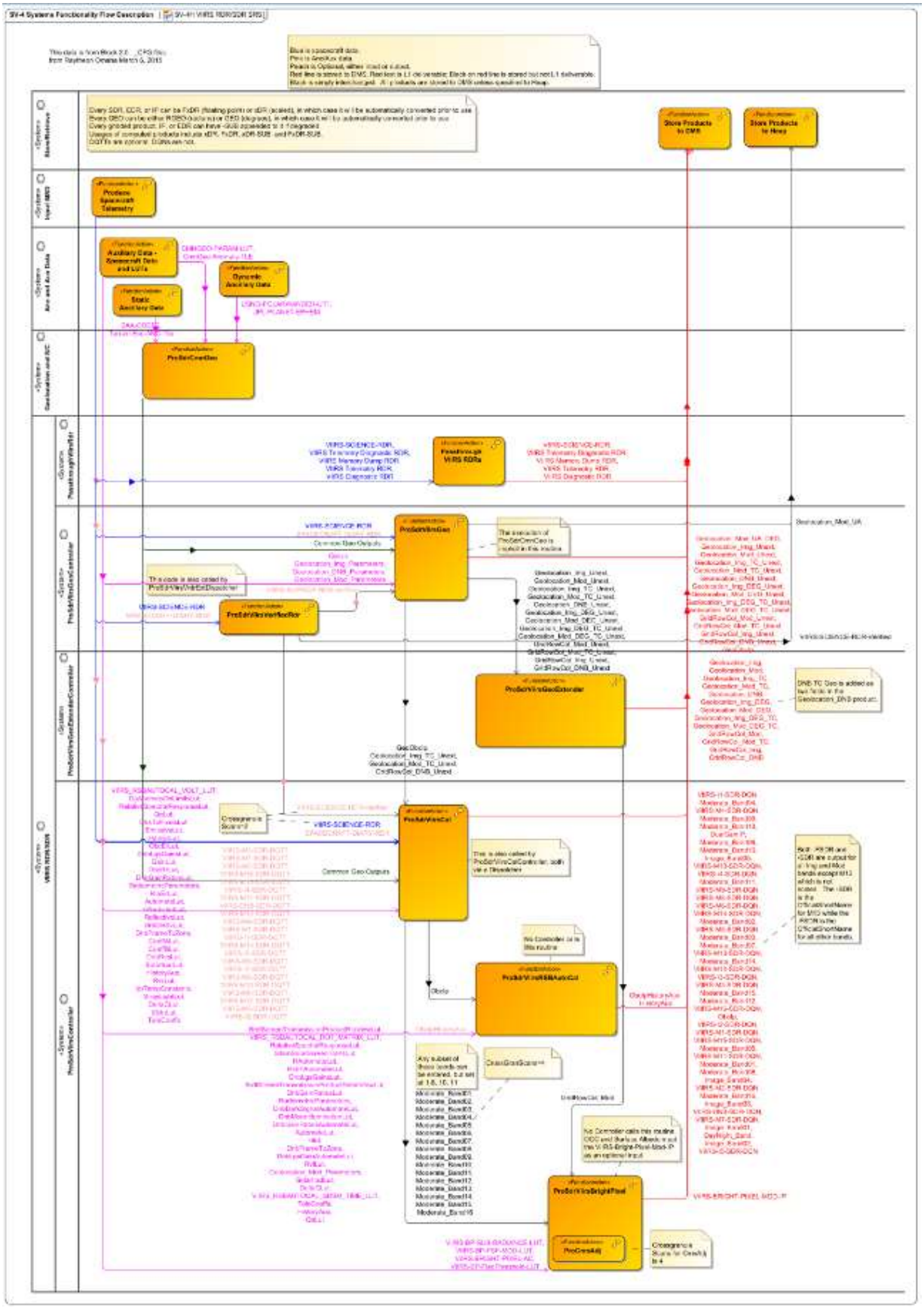

Figure: 3-1 VIIRS RDR/SDR Data Flows

Table: 3-1 Systems Resource Flow Matrix: VIIRS RDR/SDR

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
1	•VIIRS-SCIENCE-RDR	•VIIRS-SCIENCE-RDR	•RDRE-VIRS-C0030	Input MSD	VIIRS RDR/SDR	Produce Spacecraft Telemetry	ProSdrViirs VerifiedRdr
2	•VIIRS-SCIENCE-RDR •VIIRS Telemetry Diagnostic RDR •VIIRS Memory Dump RDR •VIIRS Telemetry RDR •VIIRS Diagnostic RDR	•VIIRS-SCIENCE-RDR •VIIRS-TELDIAG-RDR •VIIRS-DUMP-RDR •VIIRS-TELEMETRY-RDR •VIIRS-DIAGNOSTIC-RDR	•RDRE-VIRS-C0030 •RDRE-VIRS-C0036 •RDRE-VIRS-C0035 •RDRE-VIRS-C0031 •RDRE-VIRS-C0032	Input MSD	VIIRS RDR/SDR	Produce Spacecraft Telemetry	Passthrough VIIRS RDRs
3	•VIIRS-SCIENCE-RDR	•VIIRS-SCIENCE-RDR	•RDRE-VIRS-C0030	Input MSD	VIIRS RDR/SDR	Produce Spacecraft Telemetry	ProSdrViirs Geo
4	•VIIRS-SCIENCE-RDR	•VIIRS-SCIENCE-RDR	•RDRE-VIRS-C0030	Input MSD	VIIRS RDR/SDR	Produce Spacecraft Telemetry	ProSdrViirs Cal
5	•SPACECRAFT-DIARY-RDR	•SPACECRAFT-DIARY-RDR	•RDRE-SCAE-C0030	Input MSD	VIIRS RDR/SDR	Produce Spacecraft Telemetry	ProSdrViirs Cal
6	•VIIRS-M3-SDR-DQTT •VIIRS-M7-SDR-DQTT •VIIRS-M2-SDR-DQTT •VIIRS-M16-SDR-DQTT •VIIRS-M15-SDR-DQTT •VIIRS-I4-SDR-DQTT	•VIIRS-M3-SDR-DQTT •VIIRS-M7-SDR-DQTT •VIIRS-M2-SDR-DQTT •VIIRS-M16-SDR-DQTT •VIIRS-M15-SDR-DQTT •VIIRS-I4-SDR-DQTT	•DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000	Anc and Aux Data	VIIRS RDR/SDR	Auxiliary Data - Spacecraft Data and LUTs	ProSdrViirs Cal

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
	•VIIRS-M11-SDR-DQTT •VIIRS-DNB-SDR-DQTT •VIIRS-M13-SDR-DQTT •VIIRS-M4-SDR-DQTT •VIIRS-M1-SDR-DQTT •VIIRS-I1-SDR-DQTT •VIIRS-M14-SDR-DQTT •VIIRS-I5-SDR-DQTT •VIIRS-M9-SDR-DQTT •VIIRS-I3-SDR-DQTT •VIIRS-M8-SDR-DQTT •VIIRS-M10-SDR-DQTT •VIIRS-M6-SDR-DQTT •VIIRS-M12-SDR-DQTT •VIIRS-M5-SDR-DQTT •VIIRS-I2-SDR-DQTT	•VIIRS-M11-SDR-DQTT •VIIRS-DNB-SDR-DQTT •VIIRS-M13-SDR-DQTT •VIIRS-M4-SDR-DQTT •VIIRS-M1-SDR-DQTT •VIIRS-I1-SDR-DQTT •VIIRS-M14-SDR-DQTT •VIIRS-I5-SDR-DQTT •VIIRS-M9-SDR-DQTT •VIIRS-I3-SDR-DQTT •VIIRS-M8-SDR-DQTT •VIIRS-M10-SDR-DQTT •VIIRS-M6-SDR-DQTT •VIIRS-M12-SDR-DQTT •VIIRS-M5-SDR-DQTT •VIIRS-I2-SDR-DQTT	•DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000 •DP_NU-LM2030-000				
7	•QaLut •Geolocation_Img_Parameters •Geolocation_DNB_Parameters	•VIIRS-SDR-QA-V2-LUT •VIIRS-SDR-GEO-IMG-PARAM-V2-LUT	•NP_NU-LM0233-040 •NP_NU-LM0233-211	Anc and Aux Data	VIIRS RDR/SDR	Auxiliary Data - Spacecraft Data and LUTs	ProSdrViirsGeo

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
	•Geolocation_Mod_Parameters	•VIIRS-SDR-GEO-DNB-PARAM-V2-LUT •VIIRS-SDR-GEO-MOD-PARAM-V2-LUT	•NP_NU-LM0233-213 •NP_NU-LM0233-212				
8	•VIIRS-BP-SUB-RADIANCE-LUT •VIIRS-BP-PSF-MOD-LUT •VIIRS-BRIGHT-PIXEL-AC •VIIRS-BP-FlagThreshold-LUT	•VIIRS-BP-SUB-RADIANCE-LUT •VIIRS-BP-PSF-MOD-LUT •VIIRS-Bright-Pixel-AC •VIIRS-BP-FlagThreshold-LUT	•NP-NU-LM0235-001 •NP_NU-LM-235-000 •DP-NU-LM2020-011 •NP_NU-LM0235-002	Anc and Aux Data	VIIRS RDR/SDR	Auxiliary Data - Spacecraft Data and LUTs	ProSdrViirs BrightPixel
9	•VIIRS_RSBAUTOCAL_VOLT_LUT •DgAnomalyDnLimitsLut •RelativeSpectralResponseLut •QaLut •ObsToPixelsLut •EmissiveLut •HamErLut •ObcErLut •DnbLgsGainsLut •ObcRrLut •DnbGainRatiosLut •RadiometricParameters •RtaErLut •AutomateLut •FPredictedLut •ReflectiveLut •DnbDnSvLut •DnbFrameToZone •DnbRvsLut	•VIIRS-SOLAR-DIFF-VOLT-LUT •VIIRS-SDR-DG-ANOMALY-DN-LIMITS-LUT •VIIRS-SDR-RELATIVE-SPECTRAL-RESPONSE-LUT •VIIRS-SDR-QA-V2-LUT •VIIRS-SDR-OBS-TO-PIXELS-LUT •VIIRS-SDR-EMISSIVE-V2-LUT •VIIRS-SDR-HAM-ER-LUT •VIIRS-SDR-OBC-ER-LUT •VIIRS-SDR-DNB-LGS-GAINS-LUT •VIIRS-SDR-OBC-RR-LUT	•NP_NU-LM0233-084 •NP_NU-LM0233-033 •NP_NU-LM0233-090 •NP_NU-LM0233-040 •NP_NU-LM0233-039 •NP_NU-LM0233-030 •NP_NU-LM0233-036 •NP_NU-LM0233-037 •NP_NU-LM0233-097 •NP_NU-LM0233-032 •NP_NU-LM0233-038	Anc and Aux Data	VIIRS RDR/SDR	Auxiliary Data - Spacecraft Data and LUTs	ProSdrViirs Cal

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
	•SolarIradLut •HistoryAux •RvsLut •bbTempConstants •StrayLightLut •DeltaCLut •EbbtLut •TeleCoeffs	•VIIRS-SDR-DNB-GAIN-RATIOS-LUT •VIIRS-SDR-RADIOMETRIC-PARAM-V4-LUT •VIIRS-SDR-RTA-ER-LUT •VIIRS-SDR-CAL-AUTOMATE-LUT •VIIRS-SDR-F-PREDICTED-LUT •VIIRS-SDR-REFLECTIVE-LUT •VIIRS-SDR-DNB-DN0-LUT •VIIRS-SDR-DNB-FRAME-TO-ZONE-LUT •VIIRS-SDR-DNB-RVF-LUT •VIIRS-SDR-SOLAR-IRAD-LUT •VIIRS-RSBAUTOCAL-HISTORY-AUX •VIIRS-SDR-RVF-LUT •VIIRS-SDR-BB-TEMP-COEFFS-LUT •VIIRS-SDR-DNB-STRAY-LIGHT-CORRECTION-LUT •VIIRS-SDR-DELTA-C-LUT •VIIRS-SDR-EBBT-LUT	•NP_NU-LM0233-096 •NP_NU-LM0233-041 •NP_NU-LM0233-044 •NP_NU-LM0233-095 •NP_NU-LM0233-086 •NP_NU-LM0233-042 •NP_NU-LM0233-026 •NP_NU-LM0233-027 •NP_NU-LM0233-022 •NP_NU-LM0233-023 •NP_NU-LM0233-028 •NP_NU-LM0233-047 •IMPI_VRAC_R0100 •NP_NU-LM0233-045 •NP_NU-LM0233-021 •NP_NU-LM0233-035 •NP_NU-LM0233-024 •NP_NU-LM0233-029				

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
		•VIIRS-SDR-TELE-COEFFS-LUT	•NP_NU-LM0233-048				
10	•ObcIpHistoryAux	•VIIRS-RSBAUTOCAL-OBCIP-HISTORY-AUX	•None	Anc and Aux Data	VIIRS RDR/SDR	Auxiliary Data - Spacecraft Data and LUTs	ProSdrViirsRSBAutoCal
11	•BrdfScreenTransmissionProductRtaViewLut •VIIRS_RSBAUTOCAL_ROT_MATRIX_LUT •RelativeSpectralResponseLut •SdsmSolarScreenTransLut •HAutomateLut •RsbFAutomateLut •DnbLgsGainsLut •BrdfScreenTransmissionProductSdsmViewLut •DnbGainRatiosLut •RadiometricParameters •DnbDarkSignalAutomateLut •DnbMoonIlluminationLut •DnbGainRatiosAutomateLut •AutomateLut •Hlut •DnbFrameToZone •DnbLgsGainAutomateLut •RvfLut	•VIIRS-RSBAUTOCAL-BRDF-SCREEN-TRANSMISSION-PRODUCT-RTA-VIEW-LUT •VIIRS-RSBAUTOCAL-ROT-MATRIX-LUT •VIIRS-SDR-RELATIVE-SPECTRAL-RESPONSE-LUT •VIIRS-RSBAUTOCAL-SDSM-SOLAR-SCREEN-TRANS-LUT •VIIRS-RSBAUTOCAL-H-AUTOMATE-LUT •VIIRS-RSBAUTOCAL-RSB-F-AUTOMATE-LUT •VIIRS-SDR-DNB-LGS-GAINS-LUT •VIIRS-RSBAUTOCAL-BRDF-SCREEN-TRANSMISSION-	•NP_NU-LM0233-092 •NP_NU-LM0233-080 •NP_NU-LM0233-090 •NP_NU-LM0233-091 •NP_NU-LM0233-099 •NP_NU-LM0233-098 •NP_NU-LM0233-097 •NP_NU-LM0233-093 •NP_NU-LM0233-096 •NP_NU-LM0233-041 •NP_NU-LM0233-101 •NP_NU-LM0233-103 •NP_NU-LM0233-102 •NP_NU-LM0233-095 •NP_NU-LM0233-104	Anc and Aux Data	VIIRS RDR/SDR	Auxiliary Data - Spacecraft Data and LUTs	ProSdrViirsRSBAutoCal

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
	•Geolocation_Mod_Parameters •SolarIradLut •DeltaCLut •VIIRS_RSBAUTOCAL_SDSM_TIME_LUT •TeleCoeffs •HistoryAux •QaLut	PRODUCT-SDSM-VIEW-LUT •VIIRS-SDR-DNB-GAIN-RATIOS-LUT •VIIRS-SDR-RADIOMETRIC-PARAM-V4-LUT •VIIRS-RSBAUTOCAL-DNB-DARK-SIGNAL-AUTOMATE-LUT •VIIRS-RSBAUTOCAL-DNB-MOON-ILLUMINATION-LUT •VIIRS-RSBAUTOCAL-DNB-GAIN-RATIOS-AUTOMATE-LUT •VIIRS-SDR-CAL-AUTOMATE-LUT •VIIRS-RSBAUTOCAL-H-LUT •VIIRS-SDR-DNB-FRAME-TO-ZONE-LUT •VIIRS-RSBAUTOCAL-DNB-LGS-GAIN-AUTOMATE-LUT •VIIRS-RSBAUTOCAL-RVF-LUT	•NP_NU-LM0233-027 •NP_NU-LM0233-100 •NP_NU-LM0233-094 •NP_NU-LM0233-212 •NP_NU-LM0233-047 •NP_NU-LM0233-024 •NP_NU-LM0233-082 •NP_NU-LM0233-048 •IMPI_VRAC_R0100 •NP_NU-LM0233-040				

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
		•VIIRS-SDR-GEO-MOD-PARAM-V2 LUT •VIIRS-SDR-SOLAR-IRAD-LUT •VIIRS-SDR-DELTA-C-LUT •VIIRS-RSBAUTOCAL-SDSM-TIME-LUT •VIIRS-SDR-TELE-COEFFS-LUT •VIIRS-RSBAUTOCAL-HISTORY-AUX •VIIRS-SDR-QA-V2 LUT					
12	•Common Geo Outputs	•None	•None	Geolocation and S/C	VIIRS RDR/SDR	ProSdrCmnGeo	ProSdrViirsCal
13	•Common Geo Outputs	•None	•None	Geolocation and S/C	VIIRS RDR/SDR	ProSdrCmnGeo	ProSdrViirsGeo
14	•VIIRS-SCIENCE-RDR-Verified	•VIIRS-SCIENCE-RDR-Verified	•None	VIIRS RDR/SDR	VIIRS RDR/SDR	ProSdrViirsVerifiedRdr	ProSdrViirsCal
15	•GeoObcIp •Geolocation_Img_TC_Unext •Geolocation_Mod_TC_Unext •GridRowCol_DNB_Unext	•GEO-VIIRS-OBC-IP •VIIRS-IMG-RGEO-TC-UNEXT •VIIRS-MOD-RGEO-TC-UNEXT •VIIRS-DNB-GRC-UNEXT	•None • • •	VIIRS RDR/SDR	VIIRS RDR/SDR	ProSdrViirsGeo	ProSdrViirsCal
16	•VIIRS-SCIENCE-RDR-Verified	•VIIRS-SCIENCE-RDR-Verified	•None	VIIRS RDR/SDR	VIIRS RDR/SDR	ProSdrViirsVerifiedRdr	ProSdrViirsGeo
17	•ObcIp	•VIIRS-OBC-IP	•IMPI_VOBC_R0100	VIIRS RDR/SDR	VIIRS RDR/SDR	ProSdrViirsCal	ProSdrViirsRSBAutoCal

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
18	•Geolocation_Mod_UA_DEG •Geolocation_Img_Unext •Geolocation_Mod_Unext •Geolocation_Img_TC_Unext •Geolocation_Mod_TC_Unext •Geolocation_DNB_Unext •Geolocation_Img_DEG_Unext •Geolocation_Mod_DEG_Unext •Geolocation_Img_DEG_TC_Unext •Geolocation_Mod_DEG_TC_Unext •GridRowCol_Mod_Unext •GridRowCol_Mod_TC_Unext •GridRowCol_Img_Unext •GridRowCol_DNB_Unext •GeoObcIp	•VIIRS-MOD-UNAGG-GEO •VIIRS-IMG-RGEO_UNEXT •VIIRS-MOD-RGEO-UNEXT •VIIRS-IMG-RGEO-TC-UNEXT •VIIRS-MOD-RGEO-TC-UNEXT •VIIRS-DNB-GEO-UNEXT •VIIRS-IMG-GEO-UNEXT •VIIRS-MOD-GEO-UNEXT •VIIRS-IMG-GEO-TC-UNEXT •VIIRS-MOD-GEO-TC-UNEXT •VIIRS-MOD-GRC-UNEXT •VIIRS-MOD-GRC-TC-UNEXT •VIIRS-IMG-GRC-UNEXT •VIIRS-DNB-GRC-UNEXT •GEO-VIIRS-OBC-IP	•None • • • • • • • • • • • • •None	VIIRS RDR/SDR	Store/Retrieve	ProSdrViirsGeo	Store Products to DMS
19	•VIIRS-I1-SDR-DQN •Moderate_Band04 •VIIRS-M4-SDR-DQN •Moderate_Band09 •Moderate_Band13	•VIIRS-I1-SDR-DQN •VIIRS-M4-SDR •VIIRS-M4-SDR-DQN •VIIRS-M9-SDR •VIIRS-M13-SDR	•DP_NU-L00510-000 •SDRE-VM04-C0030 •DP_NU-L00510-000	VIIRS RDR/SDR	Store/Retrieve	ProSdrViirsCal	Store Products to DMS

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
	•DualGainIP •Moderate_Band06 •Moderate_Band10 •Image_Band05 •VIIRS-M10-SDR-DQN •VIIRS-I4-SDR-DQN •Moderate_Band11 •VIIRS-M9-SDR-DQN •VIIRS-M8-SDR-DQN •VIIRS-M6-SDR-DQN •VIIRS-M14-SDR-DQN •Moderate_Band02 •VIIRS-M5-SDR-DQN •Moderate_Band03 •Moderate_Band07 •VIIRS-M13-SDR-DQN •Moderate_Band14 •VIIRS-M12-SDR-DQN •VIIRS-I3-SDR-DQN •VIIRS-M3-SDR-DQN •Moderate_Band15 •Moderate_Band12 •VIIRS-M16-SDR-DQN •ObcIp	•VIIRS-DualGain-Cal-IP •VIIRS-M6-SDR •VIIRS-M10-SDR •VIIRS-I5-SDR •VIIRS-M10-SDR-DQN •VIIRS-I4-SDR-DQN •VIIRS-M11-SDR •VIIRS-M9-SDR-DQN •VIIRS-M8-SDR-DQN •VIIRS-M6-SDR-DQN •VIIRS-M14-SDR-DQN •VIIRS-M2-SDR •VIIRS-M5-SDR-DQN •VIIRS-M3-SDR •VIIRS-M7-SDR •VIIRS-M13-SDR-DQN •VIIRS-M14-SDR •VIIRS-M12-SDR-DQN •VIIRS-I3-SDR-DQN •VIIRS-M3-SDR-DQN •VIIRS-M15-SDR •VIIRS-M12-SDR •VIIRS-M16-SDR-DQN •VIIRS-OBC-IP	•SDRE-VM09-C0030 •SDRE-VM13-C0030 •IMPI_VCDB_R0100 •SDRE-VM06-C0030 •SDRE-VM10-C0030 •SDRE-VI05-C0030 •DP_NU-L00510-000 •DP_NU-L00510-000 •SDRE-VM11-C0030 •DP_NU-L00510-000 •DP_NU-L00510-000 •DP_NU-L00510-000 •DP_NU-L00510-000 •SDRE-VM02-C0030 •DP_NU-L00510-000 •SDRE-VM03-C0030 •SDRE-VM07-C0030 •DP_NU-L00510-000 •SDRE-VM14-C0030				

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
	•VIIRS-I2-SDR-DQN •VIIRS-M1-SDR-DQN •VIIRS-M15-SDR-DQN •Moderate_Band05 •VIIRS-M11-SDR-DQN •Moderate_Band01 •Moderate_Band08 •Image_Band04 •VIIRS-M2-SDR-DQN •Moderate_Band16 •Image_Band03 •VIIRS-DNB-SDR-DQN •VIIRS-M7-SDR-DQN •Image_Band01 •DayNight_Band •Image_Band02 •VIIRS-I5-SDR-DQN	•VIIRS-I2-SDR-DQN •VIIRS-M1-SDR-DQN •VIIRS-M15-SDR-DQN •VIIRS-M5-SDR •VIIRS-M11-SDR-DQN •VIIRS-M1-SDR •VIIRS-M8-SDR •VIIRS-I4-SDR •VIIRS-M2-SDR-DQN •VIIRS-M16-SDR •VIIRS-I3-SDR •VIIRS-DNB-SDR-DQN •VIIRS-M7-SDR-DQN •VIIRS-I1-SDR •VIIRS-DNB-SDR •VIIRS-I2-SDR •VIIRS-I5-SDR-DQN	•DP_NU-L00510-000 •DP_NU-L00510-000 • DP_NU-L00510-000 •SDRE-VM15-C0030 •SDRE-VM12-C0030 •DP_NU-L00510-000 •IMPI_VOBC_R0100 •DP_NU-L00510-000 •DP_NU-L00510-000 •DP_NU-L00510-000 •SDRE-VM05-C0030 •DP_NU-L00510-000 •SDRE-VM01-C0030 •SDRE-VM08-C0030 •SDRE-VI04-C0030 •DP_NU-L00510-000 •SDRE-VM16-C0030 •SDRE-VI03-C0030 •DP_NU-L00510-000				

	Data Product Name	Collection Short Name	Mnemonic	Sending SRS	Receiving SRS	Sending Function	Receiving Function
			•DP_NU-L00510-000 •SDRE-VI01-C0030 •SDRE-VDNB-C0030 •SDRE-VI02-C0030 •DP_NU-L00510-000				
20	•VIIRS-SCIENCE-RDR •VIIRS Telemetry Diagnostic RDR •VIIRS Memory Dump RDR •VIIRS Telemetry RDR •VIIRS Diagnostic RDR	•VIIRS-SCIENCE-RDR •VIIRS-TELDIAG-RDR •VIIRS-DUMP-RDR •VIIRS-TELEMETRY-RDR •VIIRS-DIAGNOSTIC-RDR	•RDRE-VIRS-C0030 •RDRE-VIRS-C0036 •RDRE-VIRS-C0035 •RDRE-VIRS-C0031 •RDRE-VIRS-C0032	VIIRS RDR/SDR	Store/Retrieve	Passthrough VIIRS RDRs	Store Products to DMS
21	•ObcIpHistoryAux •HistoryAux	•VIIRS-RSBAUTOCAL-OBCIP-HISTORY-AUX •VIIRS-RSBAUTOCAL-HISTORY-AUX	•None •IMPI_VRAC_R0100	VIIRS RDR/SDR	Store/Retrieve	ProSdrViirsRSBAutoCal	Store Products to DMS

3.3.2 Outputs

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

SRS.01.06_64 The VIIRS RDR software shall generate the VIIRS Diagnostic RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <RDR><Diagnostic>.

Rationale: The VIIRS Diagnostic RDR is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_65 The VIIRS RDR software shall generate the VIIRS Telemetry Diagnostic RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <RDR><TelemetryDiagnostic>.

Rationale: The VIIRS Telemetry Diagnostic RDR is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_66 The VIIRS RDR software shall generate the VIIRS Memory Dump RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <RDR><MemoryDump>.

Rationale: The VIIRS Memory Dump RDR is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_67 The VIIRS RDR software shall generate the VIIRS Telemetry RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <RDR><Telemetry>.

Rationale: The VIIRS Telemetry RDR is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_68 The VIIRS RDR software shall generate the VIIRS Science RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <RDR><Science>.

Rationale: The VIIRS Science RDR is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_72 The VIIRS DNB SDR software shall generate the VIIRS Day Night Band SDR in conformance with the XML format file in Attachment A.2 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_100 The VIIRS Reflective I-band SDR software shall generate the VIIRS Reflective I-Band SDR for I-bands 1, 2, and 3, conforming with the XML format file in Attachments A.3, A.4, A.5, of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_135 The VIIRS Emissive I-band SDR software shall generate the VIIRS I Band SDR for bands I4 and I5, conforming with the XML format file in Attachments A.6 and A.7 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_168 The VIIRS Reflective M-band SDR software shall generate the VIIRS Reflective M-band SDR for M bands 1-11, conforming with the XML format file in Attachments A.9-A.19 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_203 The VIIRS Emissive M-band SDR software shall generate the VIIRS Emissive M-Band SDR for M bands 12-16, conforming with the XML format file in Attachments A.20-A.24 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_235 The VIIRS Bright Pixel IP software shall generate the VIIRS Bright Pixel IP conforming with the XML format file in Attachments A.28 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_240 The VIIRS On-board Calibrator IP software shall generate the VIIRS On-board Calibrator IP, conforming with the XML format file in Attachments A.29 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_242 The VIIRS M-band SDR geolocation software shall generate the M-band SDR geolocation product in conformance with the XML format file in Attachment A.25 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_243 The VIIRS I-band SDR geolocation software shall generate the I-band SDR geolocation product in conformance with the XML format file in Attachment A.8 of VIIRS RDR/SDR Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_244 The VIIRS DNB SDR geolocation software shall generate the DNB SDR geolocation product in conformance with the XML format file in Attachment A.1 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_245 The VIIRS M-band SDR geolocation software shall generate the terrain corrected M-band SDR geolocation in conformance with the XML format file in Attachment A.27 of JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_246 The VIIRS I-band SDR geolocation software shall generate the terrain-corrected I-band SDR geolocation in conformance with the XML format file in Attachment A.26 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_265 The VIIRS RSB Auto Cal software shall generate the VIIRS-RSBAUTOCAL History, conforming with the XML format file in Attachments A.30 the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_266 The VIIRS Calibrated Dual Gain Band IP software shall generate the VIIRS Calibrated Dual Gain Band IP conforming with the XML format file in Attachments A.31 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_474 The VIIRS SDR software shall generate the VIIRS Un-Aggregated M-band Dual-Gain Band Geolocation product in conformance with the XML format file in Attachment A.32 of the JPSS Algorithm Specification Vol II: Data Dictionary for VIIRS RDR/SDR (474-00448-02-06).

Rationale: The product profile must conform to the XML format file.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_2209 The VIIRS DNB SDR software shall process SDRs for sensor day or night modes as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_SDR><dayNight>.

Rationale: The product output is per the VIIRS sensor operational mode.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_2210 The VIIRS Reflective I-band SDR software shall process SDRs for sensor day or night modes as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_I1-3_SDR><dayNight>.

Rationale: The product output is per the VIIRS sensor operational mode.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_2211 The VIIRS Emissive I-band SDR software shall process SDRs for sensor day or night modes as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_I4-5_SDR><dayNight>.

Rationale: The product output is per the VIIRS sensor operational mode.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_2212 The VIIRS Reflective M-band SDR software shall process SDRs for sensor day or night modes as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_M1-11_SDR><dayNight>.

Rationale: The product output is per the VIIRS sensor operational mode.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_2213 The VIIRS Emissive M-band SDR software shall process SDRs for sensor day or night modes as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_M12-16_SDR><dayNight>.

Rationale: The product output is per the VIIRS sensor operational mode.

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

Block Start: 2.0.0 *Block End:* 3.0.0

3.4 Science Standards

Not applicable.

3.5 Metadata Output

Not applicable.

3.6 Quality Flag Content Requirements

SRS.01.06_96 The VIIRS DNB SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_SDR><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_131 The VIIRS Reflective I-band SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_I1-3_SDR><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_164 The VIIRS Emissive I-band SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_I4-5_SDR><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_199 The VIIRS Reflective M-band SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_M1-11_SDR><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_232 The VIIRS Emissive M-band SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_M12-16_SDR><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_237 The VIIRS Bright Pixel IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <BrightPixelIP><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_264 The VIIRS SDR geolocation software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Mband_GEO><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_957 The VIIRS SDR geolocation software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Iband_GEO><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_958 The VIIRS SDR geolocation software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_GEO><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

Mission Effectivity: JPSS-1, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

3.7 Data Quality Notification Requirements

SRS.01.06_89 The VIIRS DNB SDR software shall send data quality notifications to the operator for conditions specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <DNB_SDR><Notifications>.

Rationale: Notifications must be generated and sent based on the established logic and conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_121 The VIIRS Reflective I-band SDR software shall send data quality notifications to the operator for conditions specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_I1-3_SDR><Notifications>.

Rationale: Notifications must be generated and sent based on the established logic and conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_156 The VIIRS Emissive I-band SDR software shall send data quality notifications to the operator for conditions specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_I4-5_SDR><Notifications>.

Rationale: Notifications must be generated and sent based on the established logic and conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_189 The VIIRS Reflective M-band SDR software shall send data quality notifications to the operator for conditions specified in the JPSS Algorithm

Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Refl_M1-11_SDR><Notifications>.

Rationale: Notifications must be generated and sent based on the established logic and conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_224 The VIIRS Emissive M-band SDR software shall send data quality notifications to the operator for conditions specified in the JPSS Algorithm Specification Vol IV: SRSPF for VIIRS RDR/SDR (474-00448-04-06) <Emiss_M12-16_SDR><Notifications>.

Rationale: Notifications must be generated and sent based on the established logic and conditions.

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

Block Start: 2.0.0 *Block End:* 3.0.0

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

SRS.01.06_929 The JPSS Common Ground System shall execute the DNB radiance algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_962 The Common Ground System shall execute the Bright Pixel algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_963 The Common Ground System shall execute the Dual Gain Band calibration algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_964 The Common Ground System shall execute the on-board calibration algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_1153 The JPSS Common Ground System shall execute the RSB auto calibration algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_930 The JPSS Common Ground System shall execute the reflective I-band SDR algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_931 The JPSS Common Ground System shall execute the emissive I-band SDR algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_932 The JPSS Common Ground System shall execute the reflective M-band SDR algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_933 The JPSS Common Ground System shall execute the emissive M-band SDR algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_934 The JPSS Common Ground System shall execute the M-band geolocation algorithms.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_935 The JPSS Common Ground System shall execute the I-band geolocation algorithms.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.06_936 The JPSS Common Ground System shall execute the VIIRS DNB geolocation algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

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

Block Start: 2.0.0 *Block End:* 3.0.0

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.

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