

GSFC JPSS CMO
January 8, 2015
Released

Effective Date: November 20, 2014
Revision B

Joint Polar Satellite System (JPSS) Ground Project
Code 474
474-00448-01-17

Joint Polar Satellite System (JPSS)
Algorithm Specification Volume I:
Software Requirement Specification (SRS)
for the Cryosphere Products



National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland

Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for the Cryosphere Products JPSS Review/Approval Page

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Preface

This document is under JPSS Ground Project 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:

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Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
Rev-	August 22, 2013	This version incorporates 474-CCR-13-1160 which was approved by JPSS Ground ERB on the effective date shown.
Rev A	Jan 30, 2014	This version incorporates 474-CCR-13-1458 which was approved by JPSS Ground ERB on the effective date shown.
Rev 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.
Rev B	Nov 20, 2014	This version incorporates 474-CCR-14-1721, 474-CCR-14-1741 and 474-CCR-14-1781, 474-CCR-14-2110 and 474-CCR-14-2102 which was approved by JPSS Ground ERB on the effective date shown.

List of TBx Items

TBx	Type	ID	Text	Action
None				

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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. JPSS polar-orbiting satellites provide continued environmental observation that is currently performed by NOAA Polar Operational Environment Satellites (POES). The first JPSS satellite mission, the Suomi National Polar-orbiting Partnership (S-NPP) satellite, was successfully launched in October 2011. It will be followed by two JPSS satellites: JPSS-1, planned for launch in fiscal year (FY) 2017, with JPSS-2 to follow in FY2022.

In addition to the JPSS Program's own satellites operating in the 1330 Local Time of the Ascending Node (LTAN) orbit, NOAA also leverages mission partner assets for better global coverage. These partner assets include the Department of Defense (DoD) operational weather satellites (in the 1730 – 1930 LTAN orbit), European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Operational (Metop) satellites (in the 2130 LTAN orbit) and Japanese Aerospace Exploration Agency (JAXA) Global Change Observation Mission-Water (GCOM-W) satellites (in the 1330 LTAN orbit). JPSS routes Metop data from the McMurdo Station, Antarctica to the EUMETSAT facility in Darmstadt, Germany and EUMETSAT provides Metop data to NOAA. For GCOM, JPSS routes the GCOM-W data from Svalbard, Norway through the NOAA Satellite Operations Facility (NSOF) in Suitland, MD to the JAXA facility in Japan. The JPSS program also processes GCOM-W data and delivers GCOM-W products to the JPSS users who have JAXA permissions.

The JPSS Program provides data acquisition and routing support to the Defense Meteorological Satellite Program (DMSP) and the Coriolis Program. The JPSS Program provides data routing support to the National Science Foundation (NSF), as well as the National Aeronautics and Space Administration (NASA) Space Communication and Navigation (SCaN)-supported missions, which include the Earth Observing System (EOS). As part of the agreements for the use of McMurdo Station, JPSS will provide communications/network services for the NSF between McMurdo Station, Antarctica and Centennial, Colorado.

As a multi-mission ground infrastructure, the JPSS Ground System supports the heterogeneous constellation of the before-mentioned polar-orbiting satellites both within and outside the JPSS Program through a comprehensive set of services as listed in Table 1-1.

Table: 1-1 JPSS Ground System Services

Service	Description
Enterprise Management and Ground Operations	Provides mission management, mission operations, ground operations, contingency management and system sustainment
Flight Operations	Provides launch support and early orbit operations, telemetry and commanding, orbital operations, mission data playback, payload support, flight software upgrade, flight vehicle simulation, and disposal at the end of mission life
Data Acquisition	Provides space/ground communications for acquiring mission data
Data Routing	Provides routing of telemetry, mission and/or operations data through JPSS' global data network
Data Product Generation	Provides the processing of mission data to generate and distribute raw, sensor, environmental, and ancillary data products
Data Product Calibration and Validation	Provides calibration and validation of the data products
Field Terminal Support	Provides development and operational support to the Field Terminal customers

1.1 Identification

This SRS provides requirements for the VIIRS Cryosphere Products, containing Ice Surface Temperature (IST) EDR, Sea Ice Characterization (SIC) (Ice Age) EDR, and related intermediate products (IP) including Ice Surf Temp 1st Guess IP, Ice Weights IP, Ice Quality Flags IP, Ice Concentration IP, and Ice Reflectance/Temperature IP.

1.2 Algorithm Overview

The VIIRS IST algorithm is used for retrieval of the VIIRS IST EDR and the VIIRS Surface Temperature Intermediate Product. It is based on a water vapor correction method. It utilizes brightness temperatures from two of the VIIRS longwave infrared channels (M15 at 10.8 μm and M16 at 12.0 μm). Input data, described in Section 3.3.1, is read in. Pixels within the pre-specified horizontal coverage range are passed into the algorithm units.

The content of the Sea Ice Characterization EDR includes ice concentration, ice age, and related intermediate products. Ice concentration is defined as the fraction of a given area of sea water covered by ice. Sea ice age is defined as the time that has passed since the formation of the surface layer of an ice covered region of the ocean. Input data, described in Section 3.3.1, is read in. Pixels within the pre-specified horizontal coverage range are passed into the ice units. The algorithm consists of three separate software units:

- 1) Ice Quality
- 2) Ice Concentration
- 3) Ice Age

These units are linked in a common software process.

The *Ice Quality* process performs pixel masking and pixel weighting.

The *Ice Concentration* process derives the fractional ice cover of a pixel.

The *Ice Age* process derives the fractional ice cover of a pixel.

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 document(s) is (are) the Parent Document(s) 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
470-00067	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
470-00067-02	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD), Volume 2 - Science Product Specification (SPS)
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 document(s) is (are) the Applicable Document(s) 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
474-00052	Joint Polar Satellite System (JPSS) VIIRS Ice Surface Temperature Theoretical Basis Document (ATBD)
474-00047	Joint Polar Satellite System (JPSS) VIIRS Sea Ice Characterization Algorithm Theoretical Basis Document (ATBD)
474-00448-02-17	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Cryosphere Products
474-00448-04-17	Joint Polar Satellite System (JPSS) Algorithm Specification Volume IV: Software Requirements Specification Parameter File (SRSPF) for the Cryosphere Products

2.3 Information Documents

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of this document.

Doc. No.	Document Title
474-00333	Joint Polar Satellite System (JPSS) Ground System (GS) Architecture Description Document (ADD)
474-00054	Joint Polar Satellite System (JPSS) Ground System (GS) Concept of Operations

Doc. No.	Document Title
	(ConOps)
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon
474-00448-03-17	Joint Polar Satellite System (JPSS) Algorithm Specification Volume III: Operational Algorithm Description (OAD) for the Cryosphere Products
429-05-02-42	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for NPP
472-00251	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for JPSS-1

3 Algorithm Requirements

3.1 States and Modes

3.1.1 Normal Mode Performance

SRS.01.17_110 The Ice Surface Temperature EDR algorithm shall calculate the ice surface temperature with a measurement uncertainty of 1K.

Rationale: The measurement uncertainty value was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.17_111 The Ice Surface Temperature EDR algorithm shall calculate the ice surface temperature with an available refresh of 90% of the globe every 24 hours, averaged monthly.

Rationale: The global coverage through the available refresh constraint was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.17_154 The Sea Ice Characterization EDR algorithm shall calculate the ice age with a measurement uncertainty of 70% probability of correct typing for ice-free, new/young ice, and all other ice.

Rationale: The measurement uncertainty value as probability of correct typing was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.17_155 The Sea Ice Characterization EDR algorithm shall calculate the ice age with an available refresh of 90% of the globe every 24 hours, averaged monthly.

Rationale: The global coverage through the available refresh constraint was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.17_542 The Ice Surface Temperature EDR algorithm shall calculate the ice surface temperature with a horizontal cell size of 1km at nadir and 1.6 km at edge of scan.

Rationale: The horizontal cell size was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.17_543 The Sea Ice Characterization EDR algorithm shall calculate the ice age with a horizontal cell size of 1km at nadir and 1.6 km at edge of scan.

Rationale: The horizontal cell size was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

3.1.2 Graceful Degradation Mode Performance

SRS.01.17_256 The VIIRS Ice Quality Flags IP software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth [750m Granulation] current forecast for fallback processing when the VIIRS aerosol optical thickness IP input is not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_806 The VIIRS Ice Quality Flags IP software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth [750m Granulation] extended forecast for fallback processing when the VIIRS aerosol optical thickness IP and NAAPS TOD current forecast inputs are not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_68 The VIIRS Ice Quality Flags IP software shall use GACP Aerosol climatology data for fallback processing when VIIRS AOT IP and NAAPS total optical depth current and extended forecast data are not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_82 The VIIRS Ice Surface Temperature First Guess IP software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth [750m Granulation] current forecast for fallback processing when the VIIRS aerosol optical thickness IP input is not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_816 The VIIRS Ice Surface Temperature First Guess IP software shall use GACP Climatology data [750m Granulation] data for fallback processing when the VIIRS aerosol optical thickness IP and NAAPS AOT current and extended forecast inputs are not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_807 The VIIRS Ice Surface Temperature First Guess IP software shall use GACP Aerosol Climatology data [750m Granulation] data for fallback processing when the VIIRS aerosol optical thickness IP and NAAPS AOT current and extended forecast inputs are not available.

Rationale: The IP software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_141 The IST EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth current forecast data for fallback processing when the VIIRS AOT IP input is not available.

Rationale: The EDR software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_808 The IST EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth extended forecast data for fallback processing when the VIIRS AOT IP and NAAPS current forecast input are not available.

Rationale: The EDR software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_184 The SIC EDR software shall use NCEP extended forecast data for fallback processing when NCEP current data is not available.

Rationale: The EDR software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements. (For sea surface winds, surface pressure, surface air temperature, surface specific humidity, total column perceptible water, and total column ozone).

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

SRS.01.17_185 The SIC EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth current forecast data for fallback processing when the VIIRS AOT IP input is not available.

Rationale: The EDR software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_817 The SIC EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth extended forecast data for fallback processing when the VIIRS AOT IP and NAAPS current forecast input are not available.

Rationale: The EDR software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

SRS.01.17_187 The SIC EDR software shall use GACP Aerosol climatology data for fallback processing when VIIRS AOT optical thickness IP and NAAPS Total Optical Depth [750m Granulation] total optical depth current data and extended forecast are not available.

Rationale: The EDR software through its algorithm must generate products using back up data sources to meet the graceful degradation requirement. These degraded products are not required to meet the algorithm performance requirements.

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

3.2 Algorithm Functional Requirements

3.2.1 Product Production Requirements

Not applicable.

3.2.2 Algorithm Science Requirements

SRS.01.17_40 The VIIRS Ice Weights IP software shall incorporate a computing algorithm provided for ice weights.

Rationale: The IP software through its computing algorithm must produce Ice Weights IP in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_85 The VIIRS Ice Concentration IP software shall incorporate a computing algorithm provided for ice fraction.

Rationale: The IP software through its computing algorithm must produce Ice Concentration IP in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_87 The VIIRS Ice Concentration IP software shall incorporate a computing algorithm provided for ice concentration weights.

Rationale: The IP software through its computing algorithm must produce Ice Concentration IP in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_73 The VIIRS Ice Surface Temperature First Guess IP software shall incorporate a computing algorithm provided for ice surface temperature.

Rationale: The IP software through its computing algorithm must produce Ice Surface Temperature First Guess IP in accordance with the JPSS VIIRS Ice Surface temperature ATBD (474-00052).

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

SRS.01.17_92 The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for I-band ice tie points.

Rationale: The IP software through its computing algorithm must determine I-band Ice tie points in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_94 The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for surface temperature ice tie points.

Rationale: The IP software through its computing algorithm must determine surface temperature ice tie points in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_96 The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for local water ice tie points.

Rationale: The IP software through its computing algorithm must determine local water ice tie points in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_98 The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for local water surface temperature ice tie points.

Rationale: The IP software through its computing algorithm must determine local water surface temperature ice tie points in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_100 The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for search window quality flags.

Rationale: The IP software through its computing algorithm must determine search window quality flags in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_106 The VIIRS Ice Surface Temperature EDR software shall incorporate a computing algorithm provided for ice surface temperature.

Rationale: The EDR software through its computing algorithm must produce ice surface temperature in accordance with the JPSS VIIRS Ice Surface Temperature ATBD (474-00052).

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

SRS.01.17_149 The VIIRS Sea Ice Characterization EDR software shall incorporate a computing algorithm provided for ice age.

Rationale: The EDR software through its computing algorithm must produce ice age in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

SRS.01.17_157 The VIIRS Sea Ice Characterization EDR software shall incorporate a computing algorithm provided for ice age weighting factors.

Rationale: The EDR software through its computing algorithm must produce ice age weighting factors in accordance with the JPSS VIIRS Sea Ice Characterization ATBD (474-00047).

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

3.2.3 Algorithm Exception Handling

SRS.01.17_45 The VIIRS Ice Weights IP software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceWeightsIP><fill>.

Rationale: The IP software through its computing algorithm must fill the ice weights IP values based on the established fill conditions to satisfy exclusion and fill conditions.

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

SRS.01.17_138 The IST EDR software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceSurfTempEDR><fill>.

Rationale: The EDR software through its computing algorithm must fill the ice surface temperature values based on the established fill conditions to satisfy exclusion and fill conditions.

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

SRS.01.17_188 The SIC EDR software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <SeaIceCharEDR><fill>.

Rationale: The EDR software through its computing algorithm must fill the ice age and ice age weight factors values based on the established fill conditions to satisfy exclusion and fill conditions.

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

3.3 External Interfaces

3.3.1 Inputs

SRS.01.17_42 The VIIRS Ice Weights IP software shall incorporate inputs as specified in Table 3-1.

Rationale: The IP 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 Ice Weights IP products.

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

SRS.01.17_69 The VIIRS Ice Quality Flags IP software shall incorporate inputs specified in Table 3-1.

Rationale: The IP 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 Ice Quality Flags IP products.

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

SRS.01.17_81 The VIIRS Ice Surface Temperature First Guess IP software shall incorporate inputs specified in Table 3-1.

Rationale: The IP 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 Ice Surface Temperature First Guess IP products.

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

SRS.01.17_89 The VIIRS Ice Concentration IP software shall incorporate inputs specified in Table 3-1.

Rationale: The IP 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 Ice Concentration IP products.

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

SRS.01.17_91 The VIIRS Ice Reflectance/Temperature IP software shall incorporate inputs specified in Table 3-1.

Rationale: The IP 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 Ice Reflectance/Temperature IP products.

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

SRS.01.17_143 The IST EDR software shall incorporate inputs specified in Table 3-1.

Rationale: The EDR 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 IST products.

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

SRS.01.17_183 The SIC EDR software shall incorporate inputs specified in Table 3-1.

Rationale: The EDR 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 SIC products.

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

SRS.01.17_810 The VIIRS Ice Concentration IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).

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

SRS.01.17_811 The SIC EDR software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).

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

SRS.01.17_812 The IST EDR software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).

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

SRS.01.17_813 The VIIRS Ice Quality Flags IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).

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

SRS.01.17_814 The VIIRS Ice Weights IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).

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

SRS.01.17_815 The VIIRS Ice Surface Temperature First Guess IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).

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

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 column includes the mnemonic or short name for the data. Blanks indicate there is no mnemonic. The third and fourth 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.

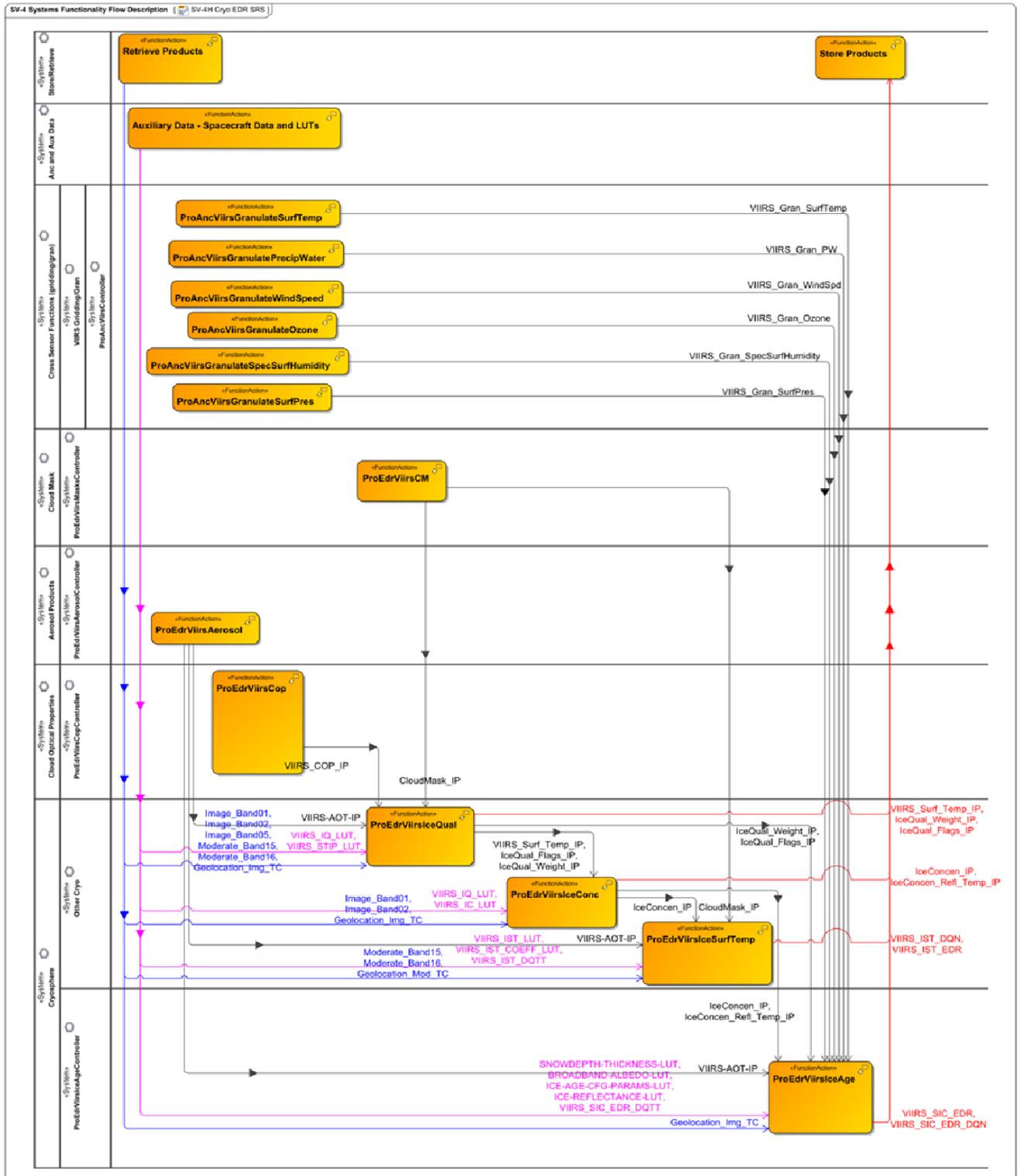


Figure: 3-1 Cryosphere Products Data Flows

Table: 3-1 Systems Resource Flow Matrix: Cryosphere Products

Data Product Name	Mnemonic or Short Name, if applicable	Source SRS	Receiving SRS	Sending Function	Receiving Function
VIIRS_Gran_SpecSurf Humidity		Grid Gran	Cryosphere	ProAncViirsGranulateSpec SurfHumidity	ProEdrViirsIceAge
VIIRS_Gran_SurfPres		Grid Gran	Cryosphere	ProAncViirsGranulateSurfPres	ProEdrViirsIceAge
VIIRS_Gran_WindSpd		Grid Gran	Cryosphere	ProAncViirsGranulateWind Speed	ProEdrViirsIceAge
VIIRS_Gran_SurfTemp		Grid Gran	Cryosphere	ProAncViirsGranulateSurf Temp	ProEdrViirsIceAge
VIIRS_Gran_PW		Grid Gran	Cryosphere	ProAncViirsGranulatePrecipWater	ProEdrViirsIceAge
VIIRS_Gran_Ozone		Grid Gran	Cryosphere	ProAncViirsGranulateOzone	ProEdrViirsIceAge
SNOWDEPTH-THICKNESS-LUT BROADBAND-ALBEDO-LUT ICE-AGE-CFG-PARAMS-LUT ICE-REFLECTANCE-LUT VIIRS_SIC_EDR_DQT	NP_NU-LM0233-006 NP_NU-LM0040-009 DP_NU-LM2030-000	Anc and Aux Data	Cryosphere	Auxiliary Data - Spacecraft Data and LUTs	ProEdrViirsIceAge
VIIRS-AOT-IP	IMPE_VAOT_R0100	Aerosol	Cryosphere	ProEdrViirsAerosol	ProEdrViirsIceAge
Geolocation_Img_TC	VIIRS-IMG-RGEO-TC	Store/Retrieve	Cryosphere	Retrieve Products	ProEdrViirsIceAge
IceConcen_IP IceConcen_Refl_Temp_IP	IMPE_VIIC_R0100 IMPE_VIRT_R0100	Cryosphere	Cryosphere	ProEdrViirsIceConc	ProEdrViirsIceAge
IceQual_Weight_IP IceQual_Flags_IP	IMPE_VIIW_R0100 IMPE_VIQF_R0100	Cryosphere	Cryosphere	ProEdrViirsIceQual	ProEdrViirsIceAge
VIIRS_IQ_LUT VIIRS_IC_LUT	NP_NU-LM0233-010 NP_NU-LM0233-008	Anc and Aux Data	Cryosphere	Auxiliary Data - Spacecraft Data and LUTs	ProEdrViirsIceConc
Image_Band01 Image_Band02 Geolocation_Img_TC	SDRE-VI01-C0030 SDRE-VI02-C0030 VIIRS-IMG-RGEO-TC	Store/Retrieve	Cryosphere	Retrieve Products	ProEdrViirsIceConc

Data Product Name	Mnemonic or Short Name, if applicable	Source SRS	Receiving SRS	Sending Function	Receiving Function
VIIRS_Surf_Temp_IP IceQual_Flags_IP IceQual_Weight_IP	IMPE_VIST_R0100 IMPE_VIQF_R0100 IMPE_VIIW_R0100	Cryosphere	Cryosphere	ProEdrViirsIceQual	ProEdrViirsIceConc
VIIRS_IQ_LUT VIIRS_STIP_LUT	NP_NU-LM0233-010	Anc and Aux Data	Cryosphere	Auxiliary Data - Spacecraft Data and LUTs	ProEdrViirsIceQual
VIIRS_COP_IP	IMPE_VCOP_C0030	Cloud Optical Properties	Cryosphere	ProEdrViirsCop	ProEdrViirsIceQual
VIIRS-AOT-IP	IMPE_VAOT_R0100	Aerosol Products	Cryosphere	ProEdrViirsAerosol	ProEdrViirsIceQual
CloudMask_IP	IMPE_CMIP_C0030	Cloud Mask	Cryosphere	ProEdrViirsCM	ProEdrViirsIceQual
Image_Band01 Image_Band02 Image_Band05 Moderate_Band15 Moderate_Band16 Geolocation_Img_TC	SDRE-VI01-C0030 SDRE-VI02-C0030 SDRE-VI05-C0030 SDRE-VM15-C0030 SDRE-VM16-C0030 VIIRS-IMG-RGEO-TC	Store/Retrieve	Cryosphere	Retrieve Products	ProEdrViirsIceQual
VIIRS-AOT-IP	IMPE_VAOT_R0100	Aerosol Products	Cryosphere	ProEdrViirsAerosol	ProEdrViirsIceSurfTemp
CloudMask_IP	IMPE_CMIP_C0030	Cloud Mask	Cryosphere	ProEdrViirsCM	ProEdrViirsIceSurfTemp
VIIRS_IST_LUT VIIRS_IST_COEFF_L UT VIIRS_IST_DQTT	NP_NU-LM0233-011 DP_NU-LM2030-000	Anc and Aux Data	Cryosphere	Auxiliary Data - Spacecraft Data and LUTs	ProEdrViirsIceSurfTemp
Moderate_Band15 Moderate_Band16 Geolocation_Mod_TC	SDRE-VM15-C0030 SDRE-VM16-C0030 VIIRS-MOD-RGEO-TC	Store/Retrieve	Cryosphere	Retrieve Products	ProEdrViirsIceSurfTemp
IceConcen_IP	IMPE_VIIC_R0100	Cryosphere	Cryosphere	ProEdrViirsIceConc	ProEdrViirsIceSurfTemp
IceConcen_IP	IMPE_VIIC_R0100	Cryosphere	Surface Albedo	ProEdrViirsIceConc	ProEdrViirsLandSurfAlbedo
VIIRS_SIC_EDR	EDRE-SICH-C1030	Cryosphere	Surface Albedo	ProEdrViirsIceAge	ProEdrViirsNHF
VIIRS_IST_EDR	EDRE-ICST-C1030	Cryosphere	Surface Albedo	ProEdrViirsIceSurfTemp	ProEdrViirsNHF
IceConcen_IP	IMPE_VIIC_R0100	Cryosphere	Sea Surface Temperature	ProEdrViirsIceConc	ProEdrViirsSst
VIIRS_IST_EDR	EDRE-ICST-C1030	Cryosphere	Grid Gran	ProEdrViirsIceSurfTemp	ProGipCSGranToGridViirsSnowIce
IceConcen_IP	IMPE_VIIC_R0100	Cryosphere	Grid Gran	ProEdrViirsIceConc	ProGipViirsGranToGridSnowIceCover
VIIRS_SIC_EDR	EDRE-SICH-C1030	Cryosphere	Store/Retrieve	ProEdrViirsIceAge	Store Products

Data Product Name	Mnemonic or Short Name, if applicable	Source SRS	Receiving SRS	Sending Function	Receiving Function
VIIRS_SIC_EDR_DQ N	DP_NU-L00090-001				
VIIRS_IST_DQN VIIRS_IST_EDR	DP_NU-L00090-001 EDRE-ICST-C1030	Cryosphere	Store/Retrieve	ProEdrViirsIceSurfTemp	Store Products
IceConcen_IP IceConcen_Refl_Temp _IP	IMPE_VIIC_R0100 IMPE_VIRT_R0100	Cryosphere	Store/Retrieve	ProEdrViirsIceConc	Store Products
VIIRS_Surf_Temp_IP IceQual_Weight_IP IceQual_Flags_IP	IMPE_VIST_R0100 IMPE_VIIW_R0100 IMPE_VIQF_R0100	Cryosphere	Store/Retrieve	ProEdrViirsIceQual	Store Products

3.3.2 Outputs

SRS.01.17_39 The VIIRS Ice Weights IP software shall generate the VIIRS Ice Weights IP product in conformance with the XML format file in Attachment A.6 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_47 The VIIRS Ice Quality Flags IP software shall generate the VIIRS Ice Quality Flags IP product in conformance with the XML format file in Attachment A.4 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_71 The VIIRS Ice Surface Temperature First Guess IP software shall generate the VIIRS Ice Surface Temperature First Guess IP product in conformance with the XML format file in Attachment A.7 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_84 The VIIRS Ice Concentration IP software shall generate the VIIRS Ice Concentration IP product in conformance with the XML format file in Attachment A.3 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_90 The VIIRS Ice Reflectance/Temperature IP software shall generate the VIIRS Ice Reflectance/Temperature IP product in conformance with the XML format file in Attachment A.5 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_112 The Ice Surface Temperature EDR software shall generate the Ice Surface Temperature EDR product in conformance with the XML format file in Attachment A.1 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_158 The Sea Ice Characterization EDR software shall generate the Sea Ice Characterization EDR product in conformance with the XML format file in Attachment A.2 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).

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

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

SRS.01.17_204 The Ice Weights IP software shall use the terrain-corrected geolocation for the VIIRS I-band.

Rationale: The product must be associated with the terrain-corrected geolocation to meet the geolocation accuracy requirement.

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

SRS.01.17_205 The IST EDR software shall use the terrain corrected geolocation for the VIIRS M-band.

Rationale: The EDR product must be associated with the terrain-corrected geolocation to meet the geolocation accuracy requirement.

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

SRS.01.17_206 The Ice Concentration IP software shall use the terrain-corrected geolocation for the VIIRS I-band.

Rationale: The product must be associated with the terrain-corrected geolocation to meet the geolocation accuracy requirement.

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

SRS.01.17_207 The Ice Quality Flags IP software shall use the terrain-corrected geolocation for the VIIRS I-band.

Rationale: The product must be associated with the terrain-corrected geolocation to meet the geolocation accuracy requirement.

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

SRS.01.17_208 The Ice Reflectance/Temperature IP software shall use the terrain-corrected geolocation for the VIIRS I-band.

Rationale: The product must be associated with the terrain-corrected geolocation to meet the geolocation accuracy requirement.

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

SRS.01.17_209 The SIC EDR software shall use the terrain corrected geolocation for the VIIRS M-band.

Rationale: The EDR product must be associated with the terrain-corrected geolocation to meet the geolocation accuracy requirement.

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

3.4 Science Standards

Not applicable.

3.5 Metadata Output

Not applicable.

3.6 Quality Flag Content Requirements

SRS.01.17_70 The VIIRS Ice Quality Flags IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification for the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceQualFlags><QF>.

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

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

SRS.01.17_74 The VIIRS Ice Surface Temperature First Guess IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceSrfTmp1stGsIP><QF>.

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

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

SRS.01.17_148 The IST EDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceSurfTempEDR><QF>.

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

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

SRS.01.17_203 The SIC EDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <SeaIceCharEDR><QF>.

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

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

3.7 Data Quality Notification Requirements

SRS.01.17_142 The IST EDR software shall send data quality notifications to the operator according to logic specified in the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17)
<IceSurfTempEDR><Notification>.

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

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

SRS.01.17_182 The SIC EDR software shall send data quality notifications to the operator according to logic specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17)
<SeaIceCharEDR><Notification>.

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

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

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.01.17_536 The JPSS Common Ground System shall execute the VIIRS Ice Surface Temperature EDR algorithm.

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

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

SRS.01.17_537 The JPSS Common Ground System shall execute the VIIRS Sea Ice Characterization EDR algorithm.

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

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

SRS.01.17_538 The JPSS Common Ground System shall execute the VIIRS Ice Concentration IP algorithm.

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

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

SRS.01.17_539 The JPSS Common Ground System shall execute the VIIRS Ice Weights IP algorithm.

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

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

SRS.01.17_818 The JPSS Common Ground System shall execute the VIIRS Ice Quality Flags IP algorithm.

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

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

SRS.01.17_540 The JPSS Common Ground System shall execute the VIIRS Ice Surface Temperature IP algorithm.

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

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

SRS.01.17_541 The JPSS Common Ground System shall execute the VIIRS Ice/Reflectance Temperature IP algorithm.

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

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

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 Table lists each requirement with CM-controlled attributes including requirement type, mission effectivity, requirement allocation(s), block start and end, method(s) for verifying each requirement, verification events, etc.

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
SRS.01.17_110	The Ice Surface Temperature EDR algorithm shall calculate the ice surface temperature with a measurement uncertainty of 1K.	P	EDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	Maturity Level Declaration
SRS.01.17_111	The Ice Surface Temperature EDR algorithm shall calculate the ice surface temperature with an available refresh of 90% of the globe every 24 hours, averaged monthly.	P	EDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	Maturity Level Declaration
SRS.01.17_154	The Sea Ice Characterization EDR algorithm shall calculate the ice age with a measurement uncertainty of 70% probability of correct typing for ice-free, new/young ice, and all other ice.	P	EDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	Maturity Level Declaration
SRS.01.17_155	The Sea Ice Characterization EDR algorithm shall calculate the ice age with an available refresh of 90% of the globe every 24 hours, averaged monthly.	P	EDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	Maturity Level Declaration
SRS.01.17_542	The Ice Surface Temperature EDR algorithm shall calculate the ice surface temperature with a horizontal cell size of 1km at nadir and 1.6 km at edge of scan.	P	EDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	Maturity Level Declaration
SRS.01.17_543	The Sea Ice Characterization EDR algorithm shall calculate the ice age with a horizontal cell size of 1km at nadir and 1.6 km at edge of scan.	P	EDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	Maturity Level Declaration
SRS.01.17_256	The VIIRS Ice Quality Flags IP	G	IP	S-NPP	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth [750m Granulation] current forecast for fallback processing when the VIIRS aerosol optical thickness IP input is not available.			JPSS-1 JPSS-2						
SRS.01.17_806	The VIIRS Ice Quality Flags IP software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth [750m Granulation] extended forecast for fallback processing when the VIIRS aerosol optical thickness IP and NAAPS TOD current forecast inputs are not available.	G	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_68	The VIIRS Ice Quality Flags IP software shall use GACP Aerosol climatology data for fallback processing when VIIRS AOT IP and NAAPS total optical depth current and extended forecast data are not available.	G	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_82	The VIIRS Ice Surface Temperature First Guess IP software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth [750m Granulation] current forecast for fallback processing when the VIIRS aerosol optical thickness IP input is not available.	G	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_816	The VIIRS Ice Surface Temperature First Guess IP software shall use GACP Climatology data [750m	G	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	Granulation] data for fallback processing when the VIIRS aerosol optical thickness IP and NAAPS AOT current and extended forecast inputs are not available.									
SRS.01.17_807	The VIIRS Ice Surface Temperature First Guess IP software shall use GACP Aerosol Climatology data [750m Granulation] data for fallback processing when the VIIRS aerosol optical thickness IP and NAAPS AOT current and extended forecast inputs are not available.	G	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_141	The IST EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth current forecast data for fallback processing when the VIIRS AOT IP input is not available.	G	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_808	The IST EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth extended forecast data for fallback processing when the VIIRS AOT IP and NAAPS current forecast input are not available.	G	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_184	The SIC EDR software shall use NCEP extended forecast data for fallback processing when NCEP current data is not available.	G	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_185	The SIC EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total	G	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	Optical Depth current forecast data for fallback processing when the VIIRS AOT IP input is not available.									
SRS.01.17_817	The SIC EDR software shall use Navy Aerosol Analysis and Prediction System (NAAPS) Total Optical Depth extended forecast data for fallback processing when the VIIRS AOT IP and NAAPS current forecast input are not available.	G	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_187	The SIC EDR software shall use GACP Aerosol climatology data for fallback processing when VIIRS AOT optical thickness IP and NAAPS Total Optical Depth [750m Granulation] total optical depth current data and extended forecast are not available.	G	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_40	The VIIRS Ice Weights IP software shall incorporate a computing algorithm provided for ice weights.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_85	The VIIRS Ice Concentration IP software shall incorporate a computing algorithm provided for ice fraction.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_87	The VIIRS Ice Concentration IP software shall incorporate a computing algorithm provided for ice concentration weights.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_73	The VIIRS Ice Surface Temperature First Guess IP software shall incorporate a computing algorithm	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	provided for ice surface temperature.									
SRS.01.17_92	The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for I-band ice tie points.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_94	The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for surface temperature ice tie points.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_96	The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for local water ice tie points.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_98	The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for local water surface temperature ice tie points.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_100	The VIIRS Ice Reflectance/Temperature IP software shall incorporate a computing algorithm provided for search window quality flags.	Ap	IP	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_106	The VIIRS Ice Surface Temperature EDR software shall incorporate a computing algorithm provided for ice surface temperature.	Ap	EDR	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_149	The VIIRS Sea Ice Characterization EDR software shall incorporate a computing algorithm provided for	Ap	EDR	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	ice age.									
SRS.01.17_157	The VIIRS Sea Ice Characterization EDR software shall incorporate a computing algorithm provided for ice age weighting factors.	Ap	EDR	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	Maturity Level Declaration
SRS.01.17_45	The VIIRS Ice Weights IP software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceWeightsIP><fill>.	E	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_138	The IST EDR software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceSurfTempEDR><fill>.	E	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_188	The SIC EDR software shall set <FillField> to <FillValue> according to <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <SeaIceCharEDR><fill>.	E	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_42	The VIIRS Ice Weights IP software shall incorporate inputs as specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_69	The VIIRS Ice Quality Flags IP software shall incorporate inputs specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
SRS.01.17_81	The VIIRS Ice Surface Temperature First Guess IP software shall incorporate inputs specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_89	The VIIRS Ice Concentration IP software shall incorporate inputs specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_91	The VIIRS Ice Reflectance/Temperature IP software shall incorporate inputs specified in Table 3-1.	I	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_143	The IST EDR software shall incorporate inputs specified in Table 3-1.	I	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_183	The SIC EDR software shall incorporate inputs specified in Table 3-1.	I	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_810	The VIIRS Ice Concentration IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).	Ft	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_811	The SIC EDR software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).	Ft	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_812	The IST EDR software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere	Ft	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	Products (474-00448-02-17).									
SRS.01.17_813	The VIIRS Ice Quality Flags IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).	Ft	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_814	The VIIRS Ice Weights IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).	Ft	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_815	The VIIRS Ice Surface Temperature First Guess IP software shall ingest tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for Cryosphere Products (474-00448-02-17).	Ft	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_39	The VIIRS Ice Weights IP software shall generate the VIIRS Ice Weights IP product in conformance with the XML format file in Attachment A.6 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_47	The VIIRS Ice Quality Flags IP software shall generate the VIIRS Ice Quality Flags IP product in conformance with the XML format file in Attachment A.4 of the JPSS	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).									
SRS.01.17_71	The VIIRS Ice Surface Temperature First Guess IP software shall generate the VIIRS Ice Surface Temperature First Guess IP product in conformance with the XML format file in Attachment A.7 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_84	The VIIRS Ice Concentration IP software shall generate the VIIRS Ice Concentration IP product in conformance with the XML format file in Attachment A.3 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_90	The VIIRS Ice Reflectance/Temperature IP software shall generate the VIIRS Ice Reflectance/Temperature IP product in conformance with the XML format file in Attachment A.5 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).	F	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_112	The Ice Surface Temperature EDR software shall generate the Ice Surface Temperature EDR product in conformance with the XML format file in Attachment A.1 of the	F	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).									
SRS.01.17_158	The Sea Ice Characterization EDR software shall generate the Sea Ice Characterization EDR product in conformance with the XML format file in Attachment A.2 of the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17).	F	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_204	The Ice Weights IP software shall use the terrain-corrected geolocation for the VIIRS I-band.	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_205	The IST EDR software shall use the terrain corrected geolocation for the VIIRS M-band.	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_206	The Ice Concentration IP software shall use the terrain-corrected geolocation for the VIIRS I-band.	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_207	The Ice Quality Flags IP software shall use the terrain-corrected geolocation for the VIIRS I-band.	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_208	The Ice Reflectance/Temperature IP software shall use the terrain-corrected geolocation for the VIIRS I-band.	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_209	The SIC EDR software shall use the terrain corrected geolocation for the VIIRS M-band.	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_70	The VIIRS Ice Quality Flags IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the	Q	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
	JPSS Algorithm Specification for the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceQualFlags><QF>.									
SRS.01.17_74	The VIIRS Ice Surface Temperature First Guess IP software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceSrfTmp1stGsIP><QF>.	Q	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_148	The IST EDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <IceSurfTempEDR><QF>.	Q	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_203	The SIC EDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <SeaIceCharEDR><QF>.	Q	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_142	The IST EDR software shall send data quality notifications to the operator according to logic specified in the JPSS Algorithm Specification Vol II: Data Dictionary for the Cryosphere Products (474-00448-02-17) <IceSurfTempEDR><Notification>.	N	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT

Req ID	Requirement Text	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Verification Event
SRS.01.17_182	The SIC EDR software shall send data quality notifications to the operator according to logic specified in the JPSS Algorithm Specification Vol IV: SRSPF for the Cryosphere Products (474-00448-04-17) <SeaIceCharEDR><Notification>.	N	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_536	The JPSS Common Ground System shall execute the VIIRS Ice Surface Temperature EDR algorithm.	Ai	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_537	The JPSS Common Ground System shall execute the VIIRS Sea Ice Characterization EDR algorithm.	Ai	EDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_538	The JPSS Common Ground System shall execute the VIIRS Ice Concentration IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_539	The JPSS Common Ground System shall execute the VIIRS Ice Weights IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_818	The JPSS Common Ground System shall execute the VIIRS Ice Quality Flags IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_540	The JPSS Common Ground System shall execute the VIIRS Ice Surface Temperature IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT
SRS.01.17_541	The JPSS Common Ground System shall execute the VIIRS Ice/Reflectance Temperature IP algorithm.	Ai	IP	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	2.0.0-AAT