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Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)

National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland

Joint Polar Satellite System (JPSS)
Ground System
Requirements Document (GSRD)

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Preface

This document is under JPSS Program 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 Approval Date)
Rev -	Nov. 01, 2012	This version incorporates 470-CCR-12-0029 which was approved on the effective date shown. This version was baselined in support of Change Order 6 RFP.
Rev A	Feb. 14, 2013	This version incorporates 474-CCR-13-0816 which was approved by JPSS Ground ERB 01/24/13 and 470-CCR-13-0033, which was approved by the JPSS Program CCB 02/14/13.
Rev B	Aug 01, 2013	This version incorporates 474-CCR-13-1091 which was approved by JPSS Ground ERB 06/28/13 and 470-CCR-13-0039, which was approved by the JPSS Program CCB 08/01/13.
Rev C	Mar 27, 2014	This version incorporates 474-CCR-14-1510 and 474-CCR-13-1438, which was approved by JPSS Ground ERB 01/30/14 and 470-CCR-13-0052 which was approved by the JPSS Program CCB 03/27/14.
Rev D	Dec 18, 2014	This version incorporates 474-CCR-14-1781, which was Ground ERB approved on 05/22/14, 474-CCR-14-2110, which was Ground ERB approved on 11/13/14, 474-CCR-14-2106, which was Ground ERB approved on 11/18/14, and 470-CCR-14-0089 which was approved by the JPSS Program CCB on the effective date shown.
Rev E	Sept 03, 2015	This version incorporates 474-CCR-15-2480, which was Ground ERB approved on 07/01/15, 474-CCR-15-2545, which was Ground ERB approved on 08/24/15, and 470-CCR-15-0118 which was approved by the JPSS Program CCB on the effective date shown.

Table of TBDs/TBRs/TBSs

TBx	Type	ID	Text	Action
1	TBD	GSR-1418	The DoD WSF program is planned to complement the JPSS in the early morning orbit and replace DMSP. The expected need date for the new DoD system remains TBD. Further details of the projected follow-on system will be developed when an internal DoD review of alternatives is completed. The JPSS Ground System will remain a viable option/alternative for any future DoD WSF program, but its exact roles and responsibilities remain TBD until the DoD finalizes a Material Development Decision.	Define roles and responsibilities
2	TBR	GSR-3315	The JPSS Ground System shall interface to the JPSS-2 Launch Facility in accordance with the JPSS-2 Launch Site Support Plan (TBR).	Define Document

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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. The first JPSS satellite mission, the Suomi National Polar-orbiting Partnership (S-NPP) satellite, successfully launched in October 2011. S-NPP, along with the legacy NOAA Polar Operational Environmental Satellites (POES), provides continuous environmental observations. Two JPSS satellites will follow S-NPP: 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 (±10) Local Time of the Ascending Node (LTAN) orbit, NOAA also leverages mission partner assets for complete global coverage. These partner assets include the Department of Defense (DoD) Defense Meteorological Satellite Program (DMSP) operational weather satellites (in the 1730 - 1930 LTAN orbit), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Operational (Metop) satellites (in the 2130 LTAN orbit) and the Japanese Aerospace Exploration Agency (JAXA) Global Change Observation Mission-Water (GCOM-W) satellite (in the 1330 LTAN orbit). JPSS routes Metop data from McMurdo Station, Antarctica to the EUMETSAT facility in Darmstadt, Germany and EUMETSAT, in turn, 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, processes GCOM-W data and delivers GCOM-W products to the JPSS users who have JAXA permissions.

Additionally, the JPSS Program provides data acquisition and routing support to the DMSP and the WindSat Coriolis Program. JPSS routes DMSP data from McMurdo Station to the 557th Weather Wing at Offutt Air Force Base in Omaha, NE. After processing, the 557th releases the DMSP data for public consumption over the Internet via the National Geophysical Data Center in Boulder, CO. The JPSS Program provides data routing support to the National Science Foundation (NSF), as well as the National Aeronautics and Space Administration (NASA) Space Communications and Navigation (SCaN)-supported missions, which include the Earth Observing System (EOS). As part of the agreements for the use of McMurdo Station, JPSS provides 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 Background

The National Polar-orbiting Operational Environmental Satellite System (NPOESS) program started in 1994 as a joint polar-orbiting environment satellite program among NOAA, DoD and NASA. The Office of Science and Technology Policy (OSTP) restructured NPOESS in 2010 to transition the program to NOAA and DoD to manage separate but complementary programs. NOAA, through NASA as its acquisition agent, procures the afternoon (1330) orbit satellites under the JPSS program. DoD independently procures satellites for the early morning (1730) orbit. Furthermore, assets from international partners, including JAXA's GCOM-W satellites in the 1330 orbit, complement the environmental observations along with EUMETSAT's Metop satellites in the 2130 LTAN orbit. These polar-orbiting satellites will be supported, in varying degrees, by a shared ground system, the JPSS Ground System, the data products of which are shared by all agencies for civil, military, and scientific purposes.

The JPSS Program provides operational continuity for environmental observation into the future that is currently provided by NOAA POES, DoD DMSP, and NASA EOS. Figure 1-1 illustrates these and EUMETSAT polar environmental satellite systems; and in contrast, Figure 1-2 shows a greatly consolidated system in JPSS era.

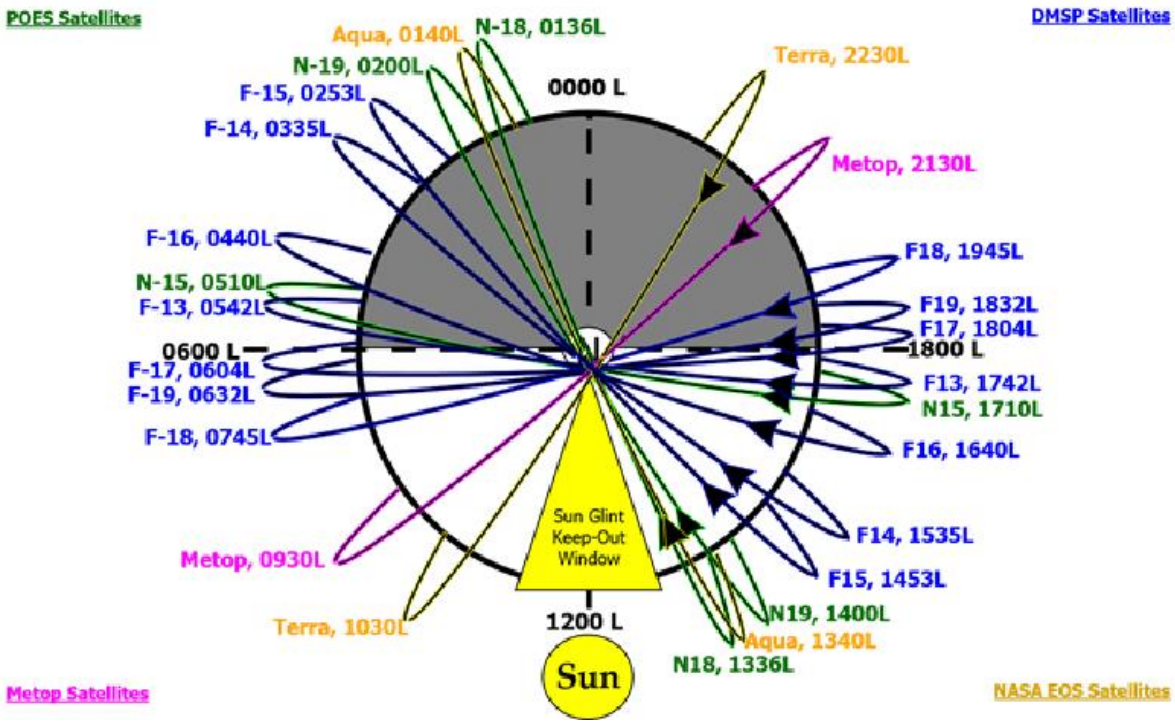

Figure: 1-1 Current NOAA POES, NASA EOS, DoD DMSP and EUMETSAT Polar Environmental Satellite Systems

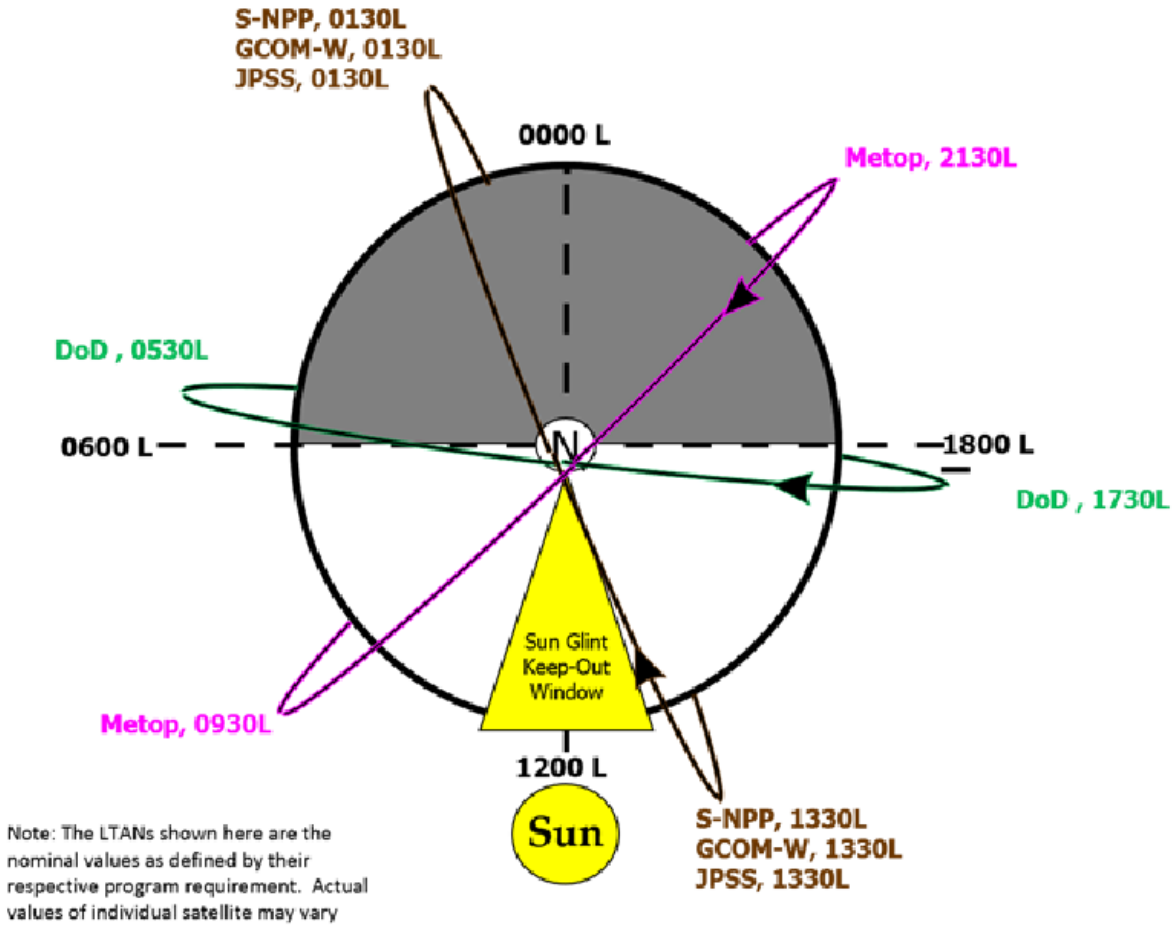

Figure: 1-2 Polar Environmental Satellite Systems in JPSS Era

The JPSS is a NOAA program that is predominately acquired through NASA. As such, NOAA defines requirements using their established management structure and provides funding and requirements to NASA which is responsible for acquiring and integrating the system. NOAA has partnered with NASA to implement the JPSS Program, using NASA's space acquisition expertise and acquisition authority. NASA is the acquisition agent for the flight systems (e.g., satellites, instruments and launch vehicles) and components of the ground segment (e.g., space/ground communications; ground network; tracking, telemetry, and control system; data processing system; and field terminal support). NOAA is the acquisition agent for components of the ground segment (e.g., data exploitation; product distribution and access; data archive and dissemination; facility upgrades) and is responsible for operations, science, and infrastructure. Once a satellite has been successfully launched and commissioned, the operational responsibility will be transferred from the NASA JPSS Program Office to the NOAA Office of Satellite and Product Operations (OSPO).

The major performance improvements brought on by the evolution from the POES, DMSP and S-NPP to the JPSS can be summarized as the following:

- Significantly more accurate spatial and spectral observations enabled by the next generation sensor suite first demonstrated on S-NPP
- Timely results with significantly reduced data latency, down from 180 minutes for POES and from 140 minutes for S-NPP to 80 minutes for JPSS-1 and JPSS-2
- Robust operations with alternate ground stations and communication networks, mission control centers, and data processing facilities (POES, S-NPP and DMSP already have this capability)
- Service-oriented shared resources to reduce overall cost

1.2 Scope

The JPSS Ground System Requirements Document (GSRD) is responsive to the JPSS Program Level 1 Requirements and the Program System Architecture and CONOPS Document (SACO).

This document includes the functional and performance requirements in support of Block 1.5 and foundational requirements for Block 2.0 for the entire multi-mission JPSS Ground System. Over time this document will evolve to contain additional Block 2.0 – 3.0 requirements as they are flowed down or derived from the Program Level 1 requirements. With some exceptions the requirements within this document are not tied to specific implementation approaches to permit the architectural design activities to take full advantage of evolving JPSS Ground System state of the practice technologies and implementation options.

As shown in Figure 1-3 the JPSS ground project document tree, this document is a level 2 document which allocates and flows down requirements to the Common Ground System (CGS-RD), the Cal/Val (GRAVITE), the Simulation Node (FVS/FVTS). The external interface requirements per section 3.2.1 and the Security requirements allocated from the GSSRD are flowed thru the GSRD to applicable elements within the Ground System.

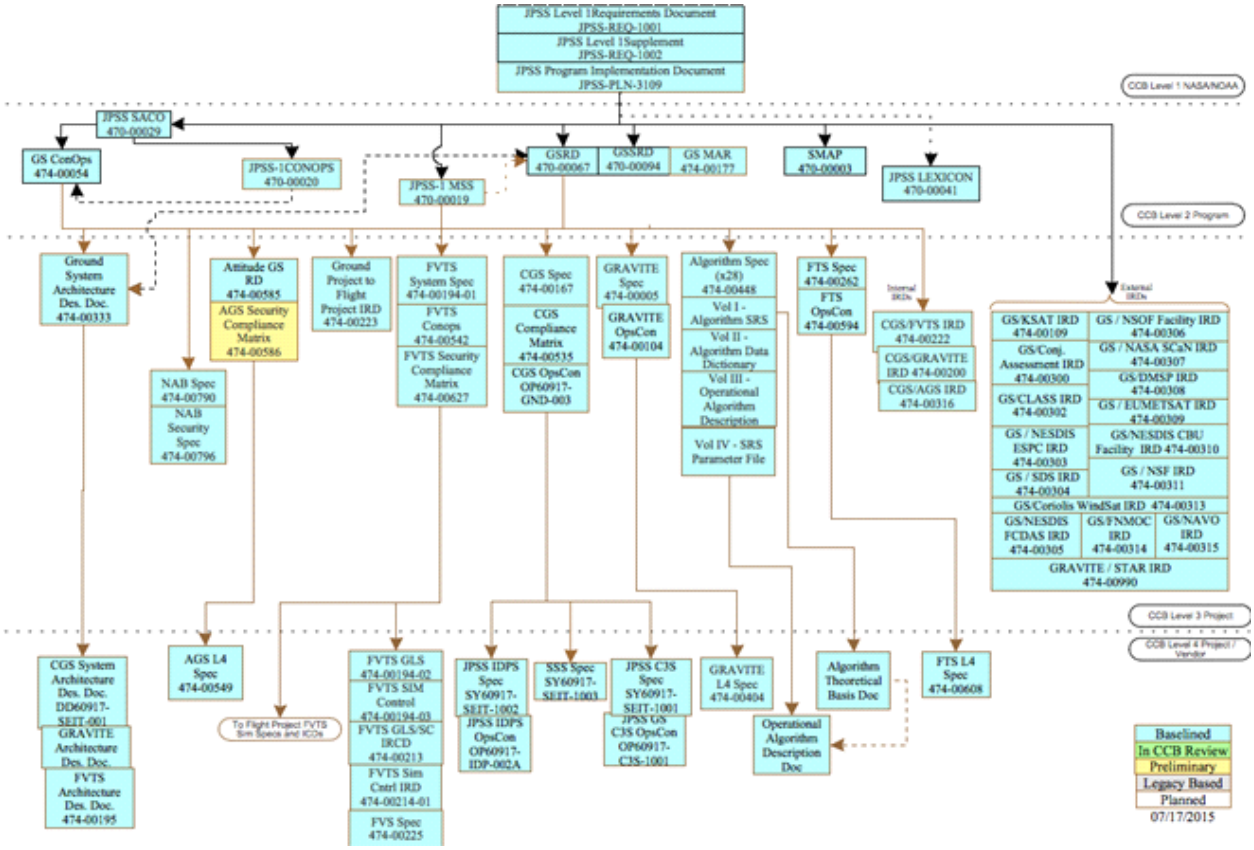

Figure: 1-3 JPSS Ground Project Document Tree

A more simplified view of the requirement hierarchy is provided below (Figure 1-4) for the Block 2.0 development.

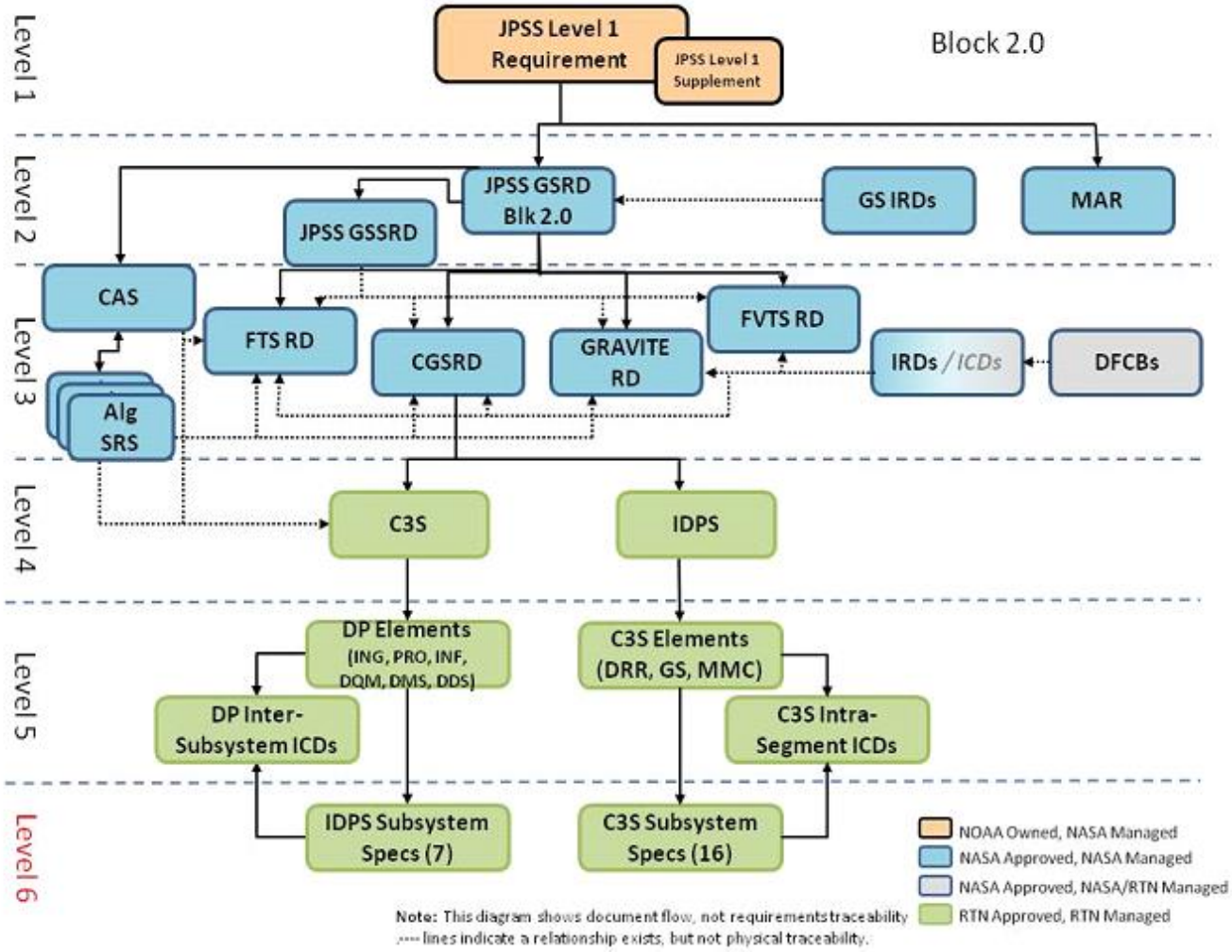

Figure: 1-4 JPSS Ground Project Document Tree (simplified)

1.3 JPSS Ground System Block Evolution

The JPSS Ground System is required to support JPSS missions through FY2025. Over this long time span, the system supports the current missions, as well as prepares to support future missions for which the definitions and requirements are still evolving. Therefore it is essential that the Ground System be flexible and adaptable to evolve along with advancing technologies and future missions.

The JPSS Ground Project plans to evolve the Ground System in implementation Blocks. With the release of each Block, the Ground System rolls out new capabilities, security enhancements, technology refreshes, and reliability improvements. Table 1-2 provides a summary of notional JPSS Ground System Implementation Blocks. Missions listed for a particular block are the missions newly added in that timeframe.

Table: 1-2 JPSS Ground System Implementation Blocks

Block	Mission	Transition To Operations (TTO) Date	Contents	Note
0	Coriolis/WindSat, POES, SCaN-supported missions	Ongoing	Coriolis/WindSat, POES, SCaN-supported missions support from Svalbard	
1.0	S-NPP	Ongoing	S-NPP support	
1.1	Metop	04/2011	Metop-A support from McMurdo Station, SCaN-supported missions support from Svalbard	
1.1	DMSP	02/2012	DMSP support from McMurdo Station	
1.2	GCOM-W1	Ongoing	System patches, upgrades and enhancement; Stop-Gap Mission Management Center (MMC) capability; GCOM-W1 support; security updates; 557th Weather Wing will receive products from NESDIS IDPS and decommissioning hardware at 557th Weather Wing; GZIP compression to data consumers implemented.	
TRANSITION TO JPSS TECH BASELINE				
2.0	JPSS-1	01/2016	JPSS-1 mission support, GCOM-W1 full capability, hardware and COTS upgrades, software fixes, separate operation configurations, failover capabilities at Consolidated Backup at Fairmont, WV, and situational awareness. Alternate Common Ground System (ACGS), extended polar station operations, services, data delivery to the Naval Oceanographic Office (NAVOCEANO) and Fleet Numerical Meteorology and Oceanography Center (FNMOC), full security requirement compliance	In time to support JPSS-1 Integration and Test (I&T) In the Block 2.0 timeframe the 557th Weather Wing will receive JPSS data products from NOAA Environmental Satellite Processing Center (ESPC).
2.1	n/a	JPSS-1 Launch + 9 months	Fleet ground management (remote planning); situational awareness (state of service, centralized reporting/monitoring); IDPS modularity (primary vs. non-primary product ordering); phased implementation of IDPS XML management; data quality monitoring	
3.0	JPSS-2	2019	JPSS-2 support, Tech Refresh	In time to support JPSS-2 I&T
	End of Program	2025		

The current deployed operational JPSS Ground System supporting S-NPP, GCOM-W1, Metop, POES, Coriolis/WindSat, DMSP, and NSF, as well as SCaN-supported mission operations, is dubbed Block 1.0 through Block 1.2. The design and development of these JPSS Ground System capabilities are based on the heritage NPOESS technical baseline with minor evolution to improve robustness, operability, security and performance.

Starting with Block 2.0 the JPSS Ground System development is being fully revised to reflect the JPSS Program requirements flow-down and fundamental changes in mission set, roles and

responsibilities, and required capabilities. As a result, Block 2.0 represents a point of departure from the NPOESS technical baseline and the arrival of JPSS Ground System technical baseline.

The deployment and transition to operation of the Block 2.0 JPSS Ground System will directly support the JPSS-1 mission with significant enhancement to meet stringent requirements associated with operational weather missions. It will also re-baseline the current JPSS Ground System with a full complement of refreshed hardware systems, and serve as the foundation for future needs for the JPSS Program mission set. Additional capabilities for remote mission planning, situational awareness, and data processing modularity will be deployed as Block 2.1 approximately nine months after JPSS-1 launch.

1.4 Overview of JPSS-Supported Missions

The JPSS Ground System provides fleet management, mission planning and scheduling, satellite control, data acquisition, routing, processing, product generation and distribution, and system sustainment functions to an array of satellites and users, as depicted in the Figure *JPSS Ground System Context Diagram*. The context diagram identifies all primary external entities to which the JPSS Ground System provides various levels of services or attains data for the services. All interfaces to and from the JPSS Ground System pass through a security layer, which is in effect around the JPSS Ground System. This security layer is in the form of access controls, user/device identification/authentication, and authorization by using certificates/credentials to authorized users/machines, etc.

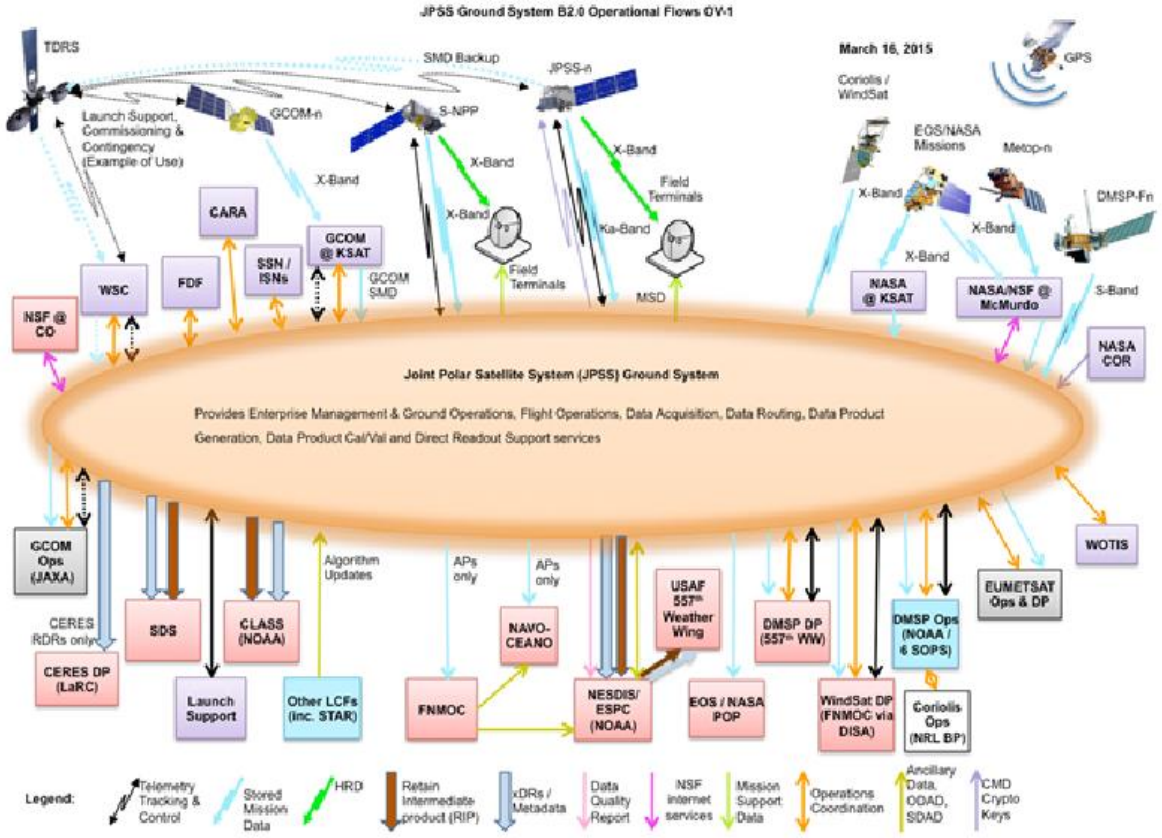

Figure: 1-5 JPSS Ground System Context Diagram

As a shared ground system, the JPSS Ground System is required to support operations of many polar-orbiting observation missions, each of which is described in the following mission sections.

1.4.1 Coriolis/WindSat

Coriolis is a joint Navy/NPOESS satellite designed to measure ocean surface wind speed and direction from space using a polarimetric radiometer. It has been operating in a sun-synchronous, 830-km, 98.7-degree, and 1800 LTAN orbit since 2002. In addition to its tactical downlink to the Navy fleet, it also has an S-band downlink for Telemetry, Tracking, & Command (TT&C) and an X-band for Stored Mission Data (SMD).

In the past, the Air Force Research, Development, Test & Evaluation Support Complex (AF RSC) operated the Coriolis satellite. The Naval Research Laboratory Blossom Point facility now operates the Coriolis satellite and coordinates schedules through the DMSP Satellite Operations Control Center (SOCC).

The JPSS Ground System provides Data Acquisition and Data Routing services to the Coriolis/WindSat mission. The DMSP SOCC mission planners schedule Coriolis satellite contacts, which use the JPSS Ground System assets at the Svalbard ground station, around S-NPP and JPSS-n scheduled contacts. During the scheduled contacts, the JPSS Ground System equipment at the Svalbard ground station acquires and routes the Coriolis/WindSat mission data to the Coriolis Service Delivery Point at the NSOF, which is then forwarded on to FNMOC for ground processing.

Figure: 1-6 Coriolis Satellite

1.4.2 SCaN-Supported Missions

Under the Memorandum of Understanding (MOU) between the SCaN Office of the Human Exploration and Operations Mission Directorate of NASA and the JPSS Program Office of NOAA, the JPSS Ground System provides the Data Routing service to the SCaN-supported missions from both Svalbard and McMurdo ground stations to the continental United States (CONUS).

At Svalbard, the main mission supported under this arrangement is the NASA EOS, which consists of a coordinated series of polar-orbiting satellites for long-term global observations of the land surface, biosphere, solid Earth, atmosphere, and oceans. The JPSS Ground System receives the EOS mission data, acquired by a Kongsberg Satellite Services (KSAT) antenna, from the NASA Service Entry Point at Svalbard, transports the data across its Svalbard-to-CONUS ground network, and delivers it to the NASA Service Delivery Point at the Goddard Space Flight Center (GSFC). The EOS mission data being transported is transparent to the JPSS Ground System and no higher-level data processing or transformation is required on the part of the JPSS Ground System. The total bandwidth allocation for this service is 150 Mbps. At McMurdo Station the JPSS Ground System provides the Data Routing service to a group of low-

rate NASA missions using its McMurdo Multi-mission Communication System (MMCS), a communication infrastructure shared among NSF, NOAA and the United States Air Force (USAF). The JPSS Ground System receives the NASA mission data, acquired by NASA's MG1 antenna, from NASA Service Entry Point at McMurdo Station, transports the data across the MMCS and the JPSS Wide Area Network (WAN), and delivers it to the NASA Service Delivery Point at GSFC. The NASA mission data being transported is transparent to the JPSS Ground System and no higher-level data processing or transformation is required on the part of the JPSS Ground System. The total outbound bandwidth allocation for this service is 1 Mbps. Moreover, the JPSS Ground System provides 512 Kbps inbound telecommunication service through the same route for NASA applications.

These network services are provided with stringent performance requirements and 24x7 support as specified in the MOU. Routine status reports are provided to NASA.

NASA's GSFC operates the EOS satellites, such as the Aqua satellite shown in the figure below, and the NASA portion of the network; and coordinates any operational issues with the JPSS Ground System Mission Operations Team (MOT).

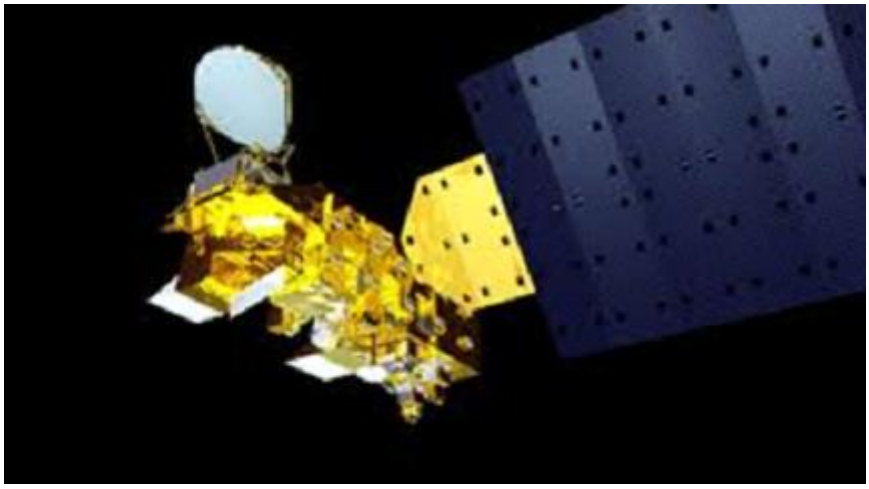

Figure: 1-7 EOS Aqua Satellite

1.4.3 Metop

Metop-A was Europe's first polar-orbiting weather satellite with a suite of instruments for observing the planet. It operated in a sun-synchronous, 817-km, 98.7-degree, and 2130 LTAN orbit since 2006. Metop-B succeeded Metop-A in calendar year (CY) 2012 and will be succeeded by Metop-C in CY2016.

Based on agreements among NOAA, NASA and EUMETSAT, the JPSS Ground System provides the Data Routing service to the Metop mission. Metop-B X-band SMD downlink at 70 Mbps is acquired by NASA's MG1 antenna at McMurdo Station, Antarctica. The acquired SMD is transferred to a EUMETSAT front-end processor where frame-level processing is performed. The processed Metop frames are then passed to the JPSS data network through its service point at McMurdo Station; and are forwarded through the MMCS using Transmission Control Protocol/Internet Protocol (TCP/IP)-based communication protocol to the EUMETSAT Polar System (EPS) Central Site in Darmstadt for processing. This added data access in the southern

hemisphere complements EUMETSAT's primary access and control point out of Svalbard and enables the Metop mission to cut its data latency by nearly 40 percent.

The operation coordination for the Metop support is conducted between JPSS Ground System and the Metop Operations Center at EUMETSAT.

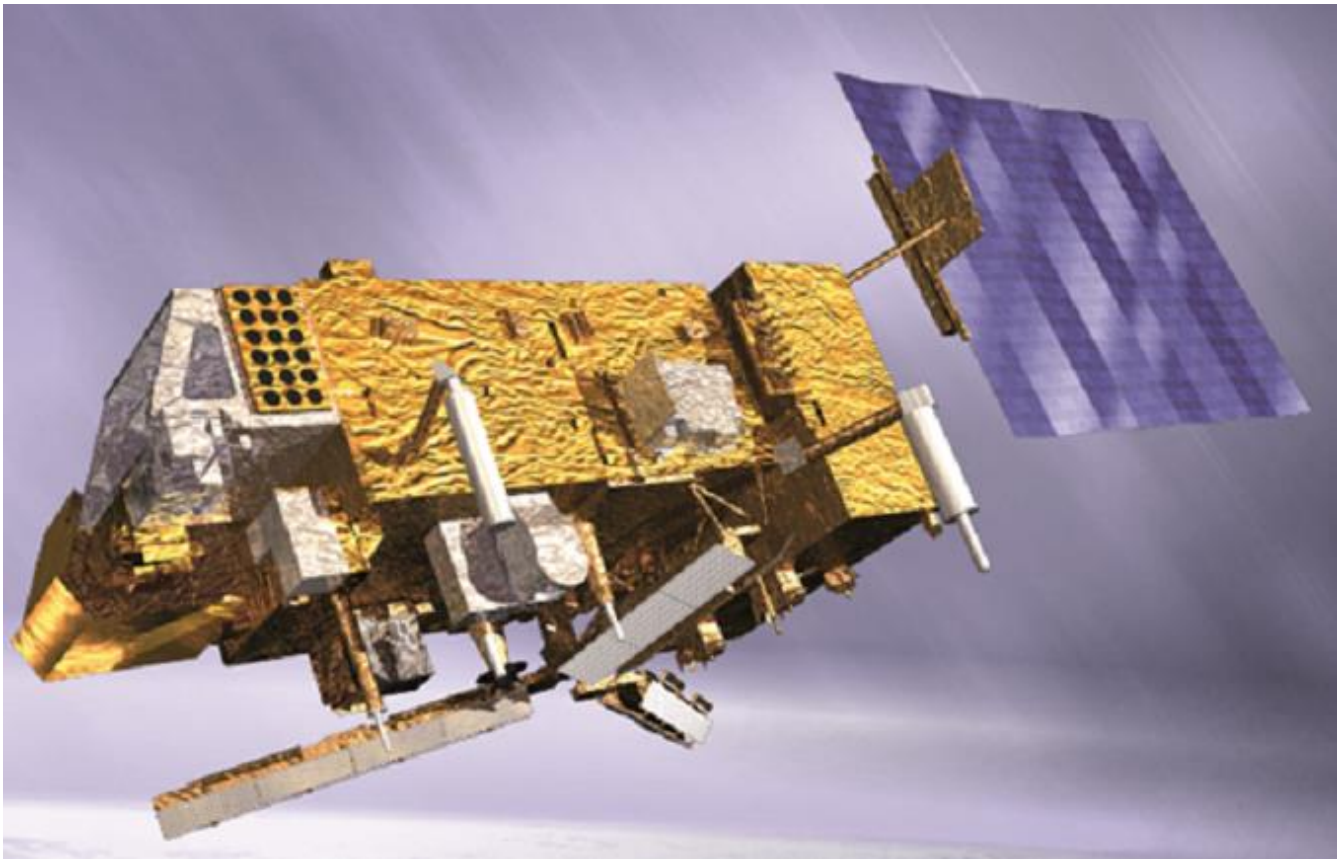

Figure: 1-8 Metop-B Satellite

1.4.4 DMSP

The DoD DMSP Program consists of polar-orbiting satellites providing the U.S. military with critical and continuous environmental information for planning and conducting military operations worldwide. The satellites have been operating at an altitude of 830km since the 1960s.

DMSP satellites use S-band links at 1.024 Mbps to provide meteorological data in real time to Air Force, Army, Navy and Marine Corps tactical ground stations and Navy ships worldwide. DMSP satellites also use S-band links at 2.66 Mbps to transmit SMD to one of four ground stations located near Fairbanks, AK; New Boston, NH; Thule Air Force Base, Greenland; and Kaena Point, HI. From these ground stations, data are relayed via Domestic Satellite communications (DOMSAT) to the 557th Weather Wing and to Fleet Numerical Meteorology and Oceanography Center (FNMOC) for processing.

The DMSP satellites are operated by DMSP SOCC at NSOF, Suitland, MD and as a backup, by 6th Space Operations Squadron at Schriever AFB, CO.

The JPSS Ground System provides Data Acquisition and Data Routing services to the DMSP mission. Based on DMSP support requests, the JPSS Ground System schedules and configures its resources at the McMurdo ground station in Antarctica. During the scheduled contacts, DMSP S-band SMD downlink is acquired by JPSS dual-band (S and Ka) receptors at McMurdo and then forwarded via JPSS ground network to the DMSP Service Delivery Point at the 557th Weather Wing for processing. This added data access in the southern hemisphere enables the DMSP mission to reduce its data latency by nearly 40%.

During a Continuity of Operations (COOP) event when the NOAA NSOF facility cannot support both JPSS and DMSP operations, JPSS will move its operations to the Consolidated Backup (CBU) facility in Fairmont, West Virginia. The JPSS mission scheduler will establish contact with the DMSP backup SOCC at Schriever AFB, CO to coordinate DMSP contact schedule and provide continued support to the DMSP operations.

Figure: 1-9 DMSP Satellite

1.4.5 NSF

McMurdo Station, Antarctica provides an ideal southern polar downlink site that can reduce data latency for polar-orbiting satellites such as Metop and DMSP by up to 40%, and enables JPSS-1 and JPSS-2 to meet their 80 minute data latency requirement.

The NSF operates the United States Antarctic Program (USAP), including the operation of the McMurdo site. Under the Memorandum of Agreement (MOA) between NASA, NSF and USAF, NSF receives access to JPSS high-speed satellite data communications in exchange for facilitating and hosting the JPSS polar-orbiting satellite earth station at McMurdo Station and providing Antarctic satellite communications earth station resources. NSF operates the Black Island Telecommunications Facility (BITF) that is the major communications transmission and

receiving site for the United States Antarctic Program. It also operates the Black Island satellite communication earth station that establishes the link with the Optus D1 telecommunication satellite, which is a part of the JPSS communications network.

The JPSS Ground System provides the Data Routing service to NSF with its ground data network. NSF mission data is routed between the NSF McMurdo Local Area Network (LAN) and the NSF Centennial, Colorado Communications Service Entry/Delivery Point, which is the hub for the NSF USAP WAN.

NSF provides the JPSS Ground System telecommunication and satellite communication services that bridge McMurdo to Belrose, Australia, where the JPSS ground network has a Point of Presence (PoP). The NSF operates the satellite communication earth station that establishes the link with Optus D1 telecommunication satellite providing bi-directional communications between Black Island and Australia.

Based on the current agreement, NSF (McMurdo) network bandwidth allocation is 18 Mbps inbound and 10 Mbps outbound.

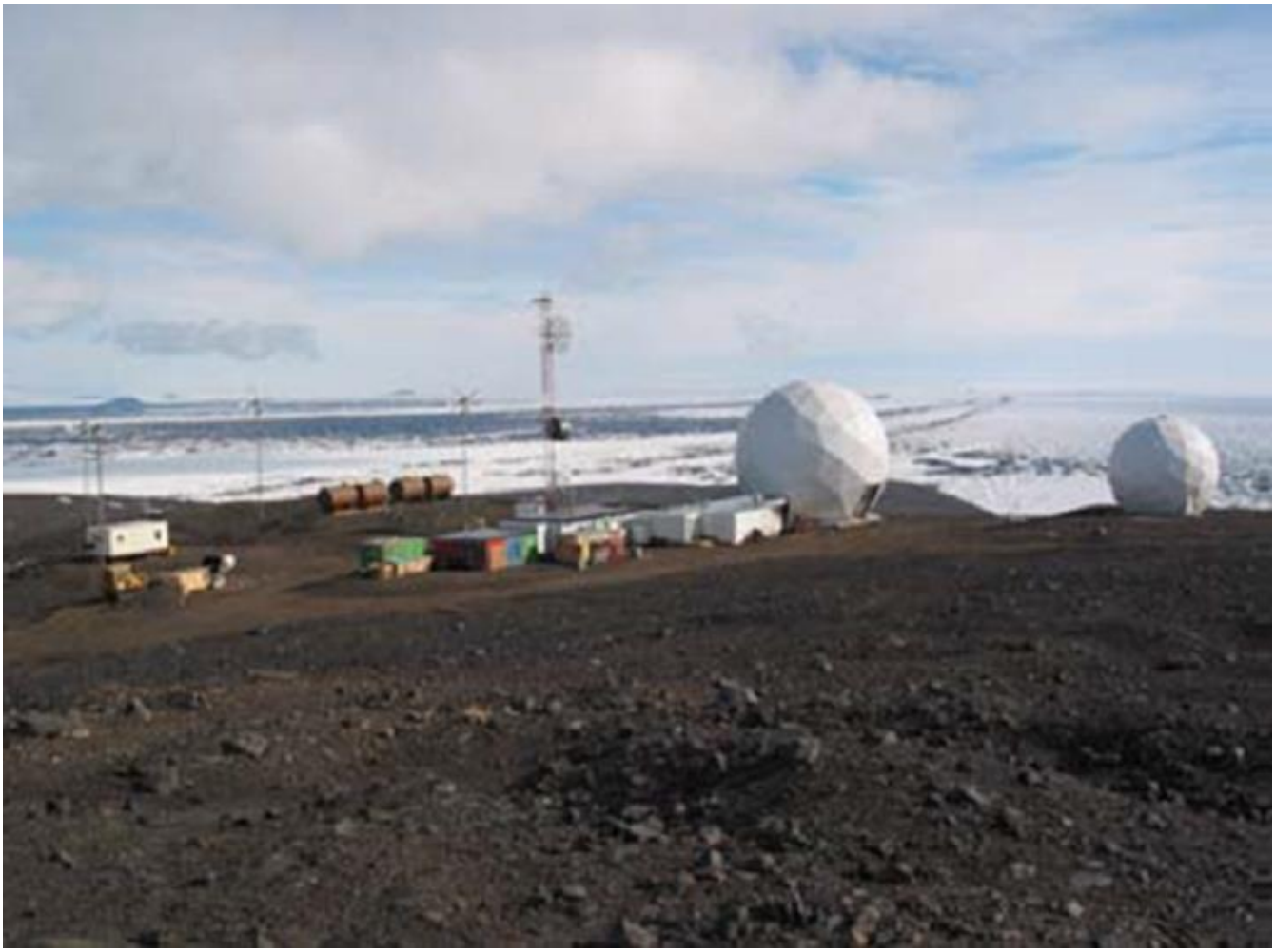

Figure: 1-10 NSF Black Island Communication Facility

1.4.6 GCOM-W1

GCOM-W1 is a JAXA satellite. Equipped with an Advanced Microwave Scanning Radiometer 2 (AMSR2), it is designed to measure water-related targets including precipitation, water vapor, sea surface wind speed, sea surface temperature, soil moisture, snow depth, etc. GCOM-W1 was successfully launched on May 18, 2012 into a sun-synchronous, 700-km, 98.7-degree, 1330 LTAN orbit, also known as the A-Train.

The GCOM-W1 satellite is operated by JAXA out of its Tsukuba Space Center in Japan. Under agreements between NOAA, NASA, JAXA and KSAT, the KSAT facilities at Svalbard, Norway are contracted by the JPSS Ground Project to provide SMD support to GCOM-W1. Globally observed mission data is transmitted using an X-band link at 20 Msps (Mega-symbols per second) 10 Megabits per second (Mbps) every pass. During each pass, mission data from two revolutions (98.8 minutes x 2) are transmitted to increase data availability. Soon after the pass is over, the mission data is then sorted by Application Packet (AP) Identifier (APID) and made available to JAXA.

Under agreements between NOAA, NASA, JAXA and KSAT, the JPSS Ground System performs Data Routing and Data Product Generation services for the GCOM-W1 mission data for NOAA. During a pass, the mission data is acquired by KSAT at Svalbard ground station, and forwarded to the JPSS ground equipment co-located at the Svalbard ground station. The Virtual Channel Data Unit (VCDUs) are extracted and forwarded to the JPSS Data Processing Node, where the sensor data are extracted and processed to generate the Raw Data Records (RDRs) for delivery to ESPC and CLASS. NOAA will generate Sensor Data Records (SDRs) and Environmental Data Records (EDRs) from the GCOM-W1 RDRs. Under agreements between Navy and JAXA, GCOM-W1 mission data (Application Packets) are also made available to FNMOC and NAVOCEANO.

Schedule coordination for GCOM-W1 support is conducted between the JPSS Ground System and KSAT as KSAT receives all GCOM-W1 ground contact information, including Two-Line Elements (TLEs), from JAXA. KSAT will provide post-pass reports for contact status and data statistics. Anomaly reporting and resolutions are also handled through KSAT. The JPSS Ground System is not involved in mission planning, spacecraft housekeeping and safety, or telemetry and commanding of GCOM-W1 mission operations. However, it monitors the spacecraft and sensor status distributed by JAXA.

Figure: 1-11 GCOM-W1 Satellite

1.4.7 Reserved

1.4.8 Suomi NPP

The S-NPP satellite is NOAA's primary operational polar-orbiting weather mission and a climate data measurement continuity mission. Successfully launched on October 28, 2011, it has been operating in a sun-synchronous, 824-km, 98.7-degree, and 1325 LTAN orbit. The instrument complement on S-NPP includes: the Visible Infrared Imager/Radiometer Suite (VIIRS), the Cross-Track Infrared Sounder (CrIS), the Advanced Technology Microwave Sounder (ATMS), the Ozone Mapping Profiler Suite (OMPS), and the Clouds and the Earth's Radiant Energy System (CERES).

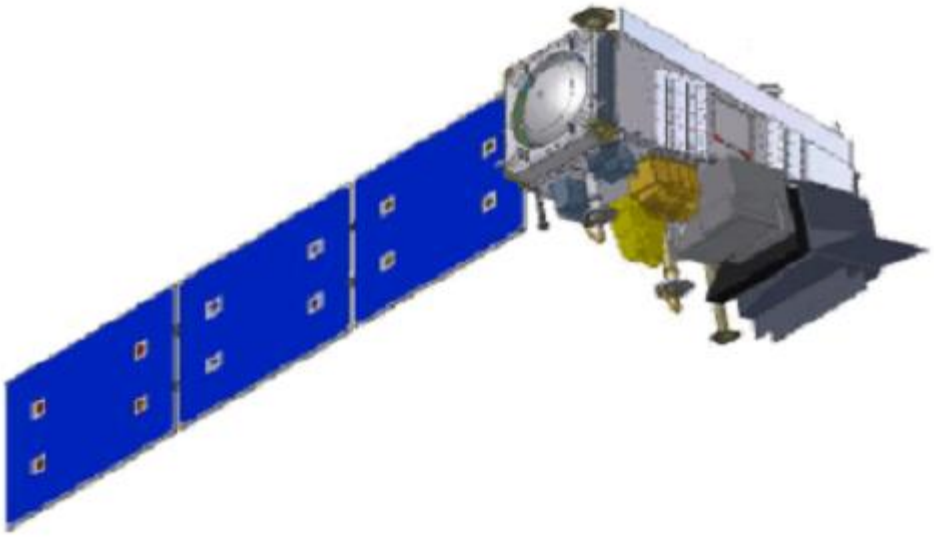

Figure: 1-12 S-NPP Satellite

In March 2012, the JPSS Program assumed, from the NPOESS Preparatory Project (NPP), full operational responsibilities for the newly-designated Suomi National Polar-orbiting Partnership (S-NPP) mission. As such, the JPSS Ground System provided the full suite of services to the S-NPP mission. This encompassed all aspects of operations necessary to keep the S-NPP spacecraft and payload safe, healthy and functional; and to maintain smooth ground operations to acquire, route, process science mission data for S-NPP Data Records (xDRs) and deliver within specifications. In February 2013 the Operations Management of the S-NPP satellite was transitioned to the National Oceanic and Atmospheric Administration's Office of Satellite and Product Operations. This limited first phase (of three) transition included 24-hour/7-day mission operations and anomaly support for the flight and data processing. The entire mission is planned for transition after JPSS-1 launch plus one year. JPSS Program remains responsible for the bulk of the S-NPP mission including ground system maintenance, sustainment and configuration control.

The JPSS Ground System plans mission activities and schedules based on spacecraft and payload housekeeping needs, science observation tasks and ground resource availabilities. It generates command loads based on the mission plan and verifies the load on the S-NPP Flight Vehicle Simulator (FVS). S-NPP uses the Svalbard ground station as its primary ground station (with Fairbanks Command and Data Acquisition Site (FCDAS) as a limited alternate site) for Telemetry and Command (T&C) and SMD retrieval operations with contact on every orbital revolution. During a pass, commanding is routinely uplinked and telemetry down linked via S-band links. The telemetry is analyzed and trended by mission operations personnel for health and safety. The T&C operation is also available through NASA's Space Network (SN) and its Tracking and Data Relay Satellite (TDRS) System (TDRSS) for secondary support.

Orbital analysis is carried out by mission operations. Orbit maneuvers are performed when needed to maintain the desired orbit position and satellite orientation. Collision Avoidance (CA) analysis is conducted with NASA's Conjunction Assessment Risk Analysis (CARA) on a daily basis. Risk Mitigation Maneuvers (RMM) are planned and performed when necessary to avoid collision with other space objects.

Once per orbit, the SMD is down linked via a 300 Mbps X-band link and acquired by a JPSS X-band antenna at Svalbard. The SMD is preprocessed into VCDUs and routed to the JPSS Data Processing Nodes, where it is fully processed into S-NPP data products (xDRs) for delivery and archival. The data product quality is monitored and trended. Sensor calibration and product validation are performed routinely to ensure the data quality is within specifications. In addition to the primary SMD receiving site at Svalbard, S-NPP also uses NOAA FCDAS as an additional site for the SMD operations.

The JPSS Ground System provides data accounting capability for tracking data latency and data availability for the S-NPP mission. In the event a data loss is detected, retransmission can be initiated to recover the data either from upstream data storage on the ground or from the Solid State Recorder (SSR) on board S-NPP. The SSR can store up to 5 orbits of data and data can be retransmitted within the next four orbits since its original transmission.

S-NPP is capable of broadcasting observation data in real-time continuously around the globe. The observation data are transmitted via a 15 Mbps X-band link, also known as High Rate Data (HRD). Properly equipped, users on the ground who are within the view of satellite can receive and process the observation data for their local applications. The JPSS Ground System provides these Field Terminal customers with data processing algorithms and software, as well as operational support such as distribution of orbital elements, mission status and notices.

Nominally all mission operations are conducted at the Mission Management Center (MMC) located at the NSOF. However, as an operational mission, the continuity of operations is critical to the S-NPP mission success. A limited alternate mission operation facility (Stop-Gap Mission Management Center—SGMMC) is available in Aurora, CO to support basic T&C operations and will be superseded by a full mission backup center in Fairmont, WV to support T&C and essential mission data processing operations. In the event the MMC at NSOF is unavailable, S-NPP operations can be transferred to an alternate facility within hours to minimize operational impacts.

During the S-NPP prime mission life (five years), the JPSS Program will perform system sustainment for both flight and ground assets in coordination with spacecraft, instrument and ground factories. The flight software, including calibration tables, and spacecraft database will be upgraded as needed. Ground hardware and software, including algorithms, will also go through upgrades to enhance security, reliability, functionality and performance. The JPSS Ground System is designed with redundant strings so that minimum downtime is required for major hardware and software upgrades.

At the end of the S-NPP mission, the JPSS Ground System will support generation and execution of the S-NPP de-orbit plan for its orderly disposal.

1.4.9 JPSS-1/2

The JPSS Program is responsible for the development and operation of two polar-orbiting Earth observing satellites, JPSS-1 and JPSS-2. JPSS-1 is very similar to S-NPP, carrying nearly the same complement of instruments and operating in the same polar orbit. Built by Ball Aerospace and Technologies Corporation (BATC), it is scheduled for launch in FY2017 to provide operational continuity with the S-NPP mission. JPSS-2, scheduled for launch in FY2022, will continue the legacy of S-NPP and JPSS-1 with some minor adjustment to its instrument

manifest. Although the details of its design are still evolving, its mission operations would be similar to JPSS-1 with some significant performance enhancement.

Figure: 1-13 JPSS-1 Satellite

The JPSS Ground System provides the full suite of services to the JPSS-1 mission from its development to its disposal. This encompasses all aspects of operations necessary to support satellite integration and test (I&T), pre-launch checkout, and launch and early orbit operations, to support instrument activation and commissioning, to keep JPSS-1 spacecraft and payload safe, healthy and functional; and to maintain smooth ground operations to acquire, route, process mission data for JPSS data products (xDRs) generation and delivery within specifications.

During the satellite development, the JPSS Ground System supports satellite I&T through a series of compatibility tests, checking out interfaces and the commanding of spacecraft. When the satellite is transported to the launch site, the JPSS Ground System supports pre-launch integration and testing, and participates in the final-countdown. During the launch and early orbit, the JPSS Ground System will track the spacecraft, establish T&C contacts, activate the spacecraft and check out its health and functionality. Once the spacecraft is deemed operational, the instrument activation will begin, leading to a set of commissioning activities. Following the commissioning intensive instrument and data calibration and validation continues until all data products are certified to be operational.

The JPSS Ground System plans mission activities and schedules based on spacecraft and payload housekeeping needs, science observation tasks and ground resource availabilities. It generates command loads based on the mission plan and verifies the load on FVTS. Similar to S-NPP,

JPSS-1 uses the Svalbard ground station as its primary ground station for T&C operations with contact on every revolution. During a pass, command loads are routinely uplinked and telemetry downlinked via S-band links. The telemetry is analyzed and trended by the MOT for health and safety. The T&C operation is available through NASA's SN when contacts are needed outside of the nominal polar contact schedule, as well as for contingency operations. If the Svalbard ground station is not available for an extended period, NOAA's FCDAS ground station can be used as an alternate site for the T&C operations as well.

Mission orbital maintenance and analysis is carried out by the MOT. Orbit maneuvers and attitude calibration are performed when needed to maintain the desired orbit position and satellite orientations. CA analysis is conducted in conjunction with NASA's CARA on a daily basis. CA maneuvers are planned and performed when necessary to avoid collision with other space objects.

Unlike S-NPP, JPSS-1 uses the JPSS Ka-band receptors at Svalbard, Fairbanks, McMurdo Station, and Troll for its mission data acquisition. The Troll Satellite Station (TrollSat) operated by KSAT is located at Jutulsessen, Antarctica. These four locations for receptors provide opportunities for two SMD contacts during each orbit, significantly reducing data latency to less than 80 minutes compared to less than 140 minutes for S-NPP. During each contact, the SMD is down linked via a 300 Mbps Ka-band link and acquired by a JPSS Ka-band receptor. The SMD is preprocessed into VCDUs and routed to the Data Processing Nodes at the NSOF and CBU, where it is fully processed into JPSS data products (xDRs) for delivery to the ESPC and to the archival storage at the Comprehensive Large Array-Data Stewardship System (CLASS). The JPSS mission data (Application Packets) are also made available to FNMOC and Naval Oceanographic Office (NAVOCEANO) from the JPSS primary and backup operations centers for their data processing. The data product quality is monitored continuously in near real-time and trended over long period. Sensor calibration and product validation are performed routinely to ensure the data quality is within specifications.

In addition to using the SMD receiving sites at Svalbard, Fairbanks, Troll and McMurdo, JPSS-1 also utilizes the NASA SN as a backup for transmitting SMD to the JPSS Ground System. Utilizing TDRS multiple times per orbit for data acquisition maintains data product latency performance in case of polar ground station or satellite nadir Ka antenna failure.

The JPSS Ground System provides full data accounting capability for tracking data latency and data availability for the JPSS-1 mission. In the event a data loss is detected, retransmission can be initiated to recover the data from upstream data storage on the ground, most likely at the ground receiving sites since there are two copies of data, one at each site. In a rare case when the data never reaches the ground, retransmission from the JPSS-1 SSR can be commanded by the MOT. The JPSS-1 SSR can store at least six orbits of data so that the data can be retransmitted within the next five orbits after its original transmission.

The JPSS-1 is capable of broadcasting observation data in real-time continuously around the globe. The observation data are transmitted via a 15 Mbps X-band link, also known as HRD. Properly equipped, users on the ground within the view of satellite can receive and process the observation data for their local applications. The JPSS Ground System provides these Field Terminal customers with data processing algorithms and software, as well as operational support such as distribution of orbital elements, mission status and notices.

Nominally all mission management operations operate out of the MMC located at NOAA NSOF. However as an operational mission, the continuity of operations is critical to JPSS-1 mission success. Therefore an alternate mission operations facility is in Fairmont, WV to support T&C as well as essential mission data processing operations. In case the MMC at NSOF is unavailable, the JPSS-1 operations can be transferred to the alternate facility within hours to minimize operational impacts.

During the JPSS-1 mission life, the JPSS Ground System will perform system sustainment for both flight and ground assets in coordination with spacecraft, instrument and ground factories. The flight software, including calibration tables, and spacecraft database will be upgraded as needed. Ground hardware and software, including algorithms, will also go through upgrades to enhance security, reliability, functionality and performance. The JPSS Ground System is designed with redundant strings so that minimum downtime is required for major hardware and software upgrades.

JPSS-1 satellite handover from NASA (MOST) to NOAA (OSPO) occurs at launch plus 90 days following the successful completion of an Operational Acceptance Review (OAR) to be held at the NSOF around launch plus 85 days. This review will demonstrate compliance of the satellite (spacecraft, instruments, and flight software) to requirements and demonstrate readiness to proceed with transfer of satellite operations from NASA to NOAA. Once this transition is completed, OSPO will provide 24-hour/7-day mission operations and anomaly support for the flight and data processing for the JPSS-1 satellite. The JPSS Ground System will be formally transitioned to NOAA at JPSS-1 launch plus one year, at which point OSPO will assume responsibility for operations and maintenance and the Office of Satellite Ground Services (OSGS) will assume responsibility for sustainment and configuration control of the JPSS Ground System. When JPSS-1 reaches the end of its mission life, the JPSS Ground System will support the generation and execution of the JPSS-1 de-orbit plan for its orderly disposal.

1.4.10 DoD Weather Satellite Follow-on Program

The DoD Weather Satellite Follow-on (WSF) program is planned to complement the JPSS in the early morning orbit and replace DMSP. The expected need date for the new DoD system remains TBD. Further details of the projected follow-on system are under development. The JPSS Ground System will remain a viable option/alternative for any future DoD WSF program, but its exact roles and responsibilities remain TBD until the DoD finalizes a Material Development Decision.

1.5 Ground System Architecture

The JPSS Ground System architecture provides a high-level view of how the Concept of Operations (ConOps) and requirements are met, organized and related. The Figure *JPSS Ground System Architecture* illustrates a conceptual view of the JPSS Ground System functional capabilities and interconnectivity organized in Nodes. A Node is a collection of functions to achieve specific goals.

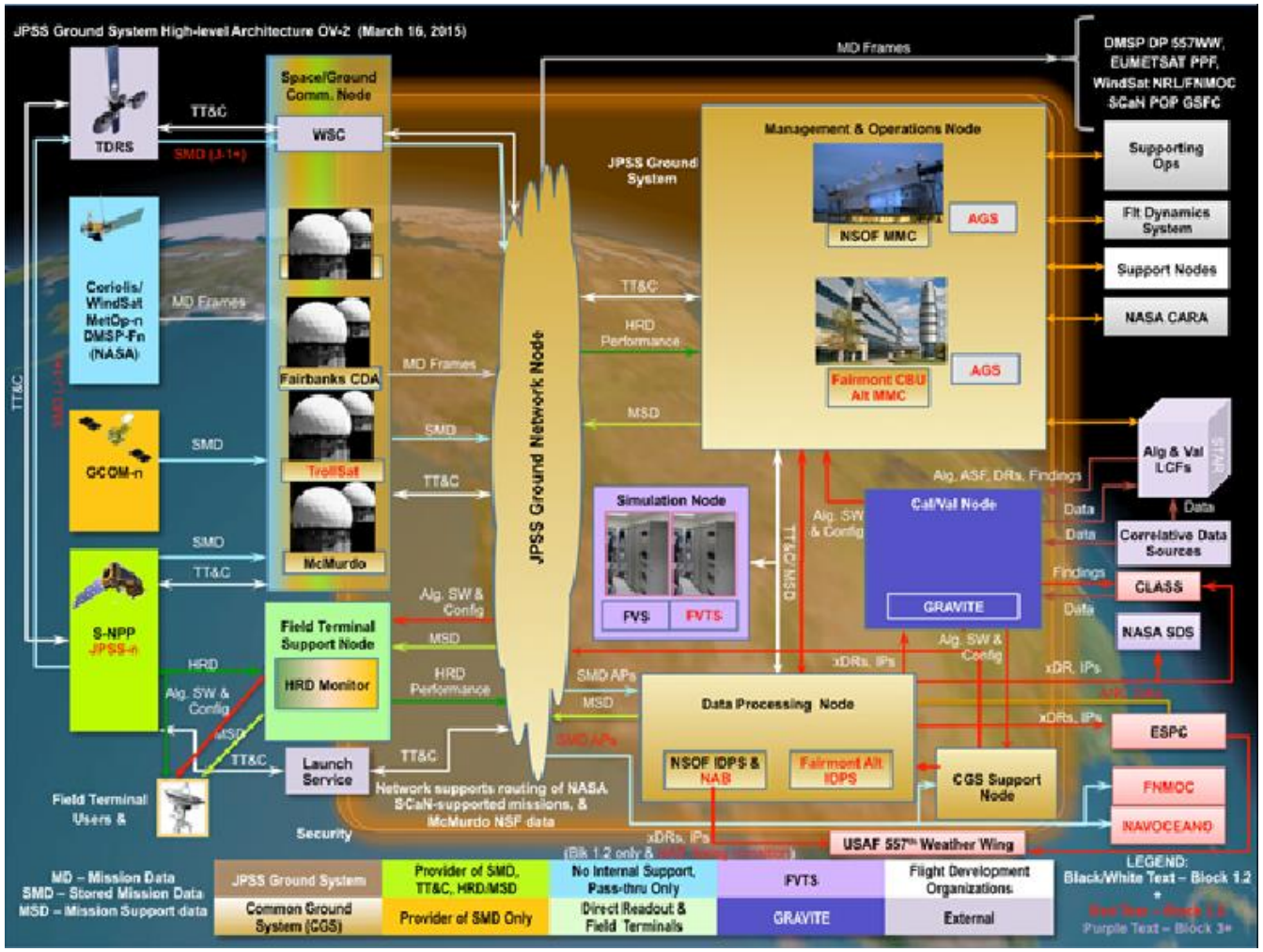

Figure: 1-14 JPSS Ground System Architecture

1.5.1 JPSS Ground System

The JPSS Ground System is composed of eight functional nodes: the Space/Ground Communications Node, the Ground Network Node, the Management and Operations Node, the Data Processing Node, the Common Ground System (CGS) Support Node, the Simulation Node, the Calibration/Validation Node, and the Field Terminal Support Node.

The CGS consists of the Space/Ground Communications Node, the Ground Network Node, the Management and Operations Node, the Data Processing Node, and the CGS Support Node.

These Nodes are described in the following sections.

1.5.2 Space/Ground Communications Node

The Space/Ground Communications Node (SGCN) is distributed around the globe. The Node provides the Radio Frequency (RF) uplink and downlink communications between the ground and spacecraft to support telemetry and commanding operations as well as mission data operations. Some of the assets used to provide Space/Ground Communications are owned and dedicated to the JPSS Program, while others are provided by other Government agencies or commercial entities.

The primary communications are provided by Kongsberg Satellite Services (KSAT) Svalbard Satellite Station (SvalSat) located in Svalbard, Norway, and the McMurdo Station S/Ka-band receptor site in Antarctica. Alternate communications are provided via the NOAA Fairbanks Command and Data Acquisition Station (FCDAS) in Fairbanks, Alaska, and KSAT Troll Satellite Station (TrollSat) located in Jutulsessen, Antarctica. The JPSS Ground System also leverages ground station assets in McMurdo Station, Antarctica to support Data Acquisition and Data Routing services to missions such as Metop, DMSP and NASA missions supported by SCaN.

Additionally, the SvalSat location provides monitoring capability for the Direct Broadcast capabilities of the S-NPP and JPSS satellites. In Block 2.0, only X-band HRD broadcast will be supported.

The White Sands Complex (WSC) is used to provide access to the Tracking and Data Relay Satellite System (TDRSS) for T&C communications when Svalbard and Fairbanks are not available or in view. For JPSS-1, and likely JPSS-2, WSC/TDRSS can also be used to provide backup for Stored Mission Data (SMD) downlink.

1.5.3 Ground Network Node

The JPSS Ground Network Node (GNN) is used to support communications among all ground system entities, including the Space/Ground Communications Node, the Management and Operations Node, the Data Processing Node, and the CGS Support Node. It consists of distributed Local Area Networks (LANs) connected together via the AT&T Multi- Protocol Label Switching (MPLS) Wide-Area Network (WAN). For some missions, such as DMSP, Metop, SCaN-supported missions, and Coriolis/WindSat, the Ground Network Node provides data routing from the Space/Ground Communications Node to the non-JPSS Data Processing Node at their respective destinations.

The GNN acquires, manages, and distributes the mission data and the mission support data for the JPSS Ground System. The GNN carries command and telemetry data between the ground

stations and mission management centers, and stored mission data from ground stations to data processing centers, including NESDIS, FNMOC and NAVOCEANO. The mission support data service includes acquisition of ancillary data used for data processing and orbit operations, as well as distributing ancillary and auxiliary data to authorized users throughout the JPSS Ground System and external-interfacing partners.

1.5.4 Management and Operations Node

The Management and Operations Node (MON) commands the spacecraft and ensures proper operation of the JPSS spacecraft and ground assets. The MON provides the mission planning and scheduling, flight operations, telemetry and commanding, orbit and attitude management, ground operations, alarms, warnings and events processing, and trending and analysis. The MON also provides the infrastructure for enterprise management as well as monitoring for the security events within the system.

The MON functionality is provided by the MMC. The primary MMC is located in Suitland, MD at the NSOF. The alternate MMC is located at the NOAA Fairmont, WV Consolidated Backup (CBU) facility. A Stop-Gap MMC is provided at the CGS vendor location in Aurora, CO for S-NPP prior to the deployment of the alternate MMC. The primary purpose of this Stop-Gap MMC is to maintain the health and safety of the satellite.

1.5.5 Data Processing Node

The Data Processing Node (DPN) processes mission data into raw, sensor and environmental data products. Currently NOAA has JPSS-provided DPN implementations to minimize WAN communications utilization. The Fleet Numerical Meteorology and Oceanography Center (FNMOC) and Naval Oceanographic Office (NAVOCEANO) will receive technical support to implement their own DPNs. The NOAA DPN distributes data products to the ESPC, the Comprehensive Large Array-Data Stewardship System (CLASS), the Government Resource for Algorithm Verification, Independent Testing, and Evaluation (GRAVITE), and the Science Data Segment (SDS).

The primary NOAA DPN is located in Suitland, MD at the NSOF. The alternate NOAA DPN is located at the NOAA Fairmont, WV CBU facility. The alternate NOAA DPN is only responsible for data flows to ESPC and CLASS.

1.5.6 Common Ground System Support Node

The JPSS Ground System is an evolving capability that will be in multiple concurrent lifecycles for the various missions being supported. As such, the ground system needs to be capable of developing capabilities for new missions and capabilities, while integrating, testing and validating releases to support launches and updates to existing missions; all the while supporting mission operations for the on-orbit satellites. The Common Ground System Support Node provides the functionality needed to support these activities.

1.5.7 Simulation Node

The JPSS Ground System's Simulation Node provides satellite and ground system simulators to support mission operations as well as integration, test and verification of new capabilities to be fielded.

The Flight Vehicle Test Suite (FVTS) and Flight Vehicle Simulator (FVS)/S-NPP Spacecraft Command and Telemetry Simulator (CTSIM) (for S-NPP only) perform the functions of the

Simulation Node in support of S-NPP, JPSS-1, and beyond. The FVTS system consists of Engineering Development Unit (EDU) and software-based simulators to support operations as well as test and verification for the JPSS Ground System.

1.5.8 Calibration/Validation Node

The JPSS Ground System's Calibration/Validation Node maintains the existing science algorithms, maintains the algorithm calibration and develops new algorithms as needed for the science mission.

The Calibration/Validation Node relies on the GRAVITE system for the JPSS Ground System-embedded computing resources and also on external Local Computing Facilities (LCF) to support the science maintenance role.

1.5.9 Field Terminal Support Node

The S-NPP and JPSS satellites include a High-Rate Data (HRD) antenna that continuously downlinks sensed data as the data are collected. Such a downlink is often referred to as a Direct Broadcast (DB). The JPSS Ground Project has defined, specific support for end user (Direct Broadcast Community) processing of DB data from the JPSS-managed satellites. The Field Terminal Support (FTS) node will support the DB community by providing software, documentation, and periodic updates using a web portal. The FTS web portal will also provide the necessary hardware and software specifications, ancillary and auxiliary data needed for processing the broadcasts, as well as making orbital data available to assist the DB community in locating the satellites of interest. With their own equipment and the above-provided information, the DB community can capture and process the HRD content and generate data products, such as RDRs, SDRs, and a subset of EDRs. In addition, the JPSS Ground System will provide equipment at the Svalbard Ground Station, which will monitor the quality of the direct broadcast link and make the HRD Monitoring report available on the web portal.

1.5.10 Continuity of Operations

With the launch of JPSS-1, the JPSS Ground System will be compliant with U.S. government continuity of operations policy, providing diversely located backup capabilities to deal with long-term outages of facilities and equipment. The current plan is to provide backup capabilities to critical Management and Operations Node functions as well as Data Processing Node functions. There will be backup Simulation Node capabilities to support the critical Management and Operations Node functions.

1.5.11 Security

The Federal Information Security Management Act (FISMA) of 2002 mandates that federal information processing systems maintain a security program and control guidelines that are commensurate with the level of risk of which the information system operates. As such, the JPSS Ground System employs a security program aimed at mitigating the risks to which the JPSS Ground System is exposed. In addition, the JPSS Ground System must meet the NOAA Level 1 requirements that the JPSS Ground System will also develop and maintain, to the fullest extent, the controls of the National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53, Recommended Security Controls for Federal Information Systems and Organizations. The JPSS Ground System Security Requirements Document (GSSRD) derives its requirements from the NIST SP 800-53; and enhances the requirements based on Department of Commerce IT SPP, NOAA IT Security Policies, and National Environmental Satellite, Data, and

Information Service (NESDIS) policies. The objective of the ground security is to be fully compliant with FISMA 2002 and NOAA IT Security Policies prior to launch of JPSS-1.

1.5.12 Support Nodes Managed by Flight Project

To support JPSS-managed missions such as S-NPP and JPSS-1, there are two support nodes that are managed under the JPSS Flight Project: the Instrument Support Node (ISN) and Spacecraft Support Node (SSN). These support nodes are outside of the JPSS Ground System but interact with the Ground System nodes under various scenarios.

The Instrument Support Node includes the infrastructure utilized by the Instrument Science Team (IST) to perform their tasks. The ISN also includes the Instrument Vendors, the Flight Project Instrument Manager, the Instrument Science Lead as well as relevant system and discipline engineers from the Flight project. The ISN maintains and updates the instrument flight software as needed, as well as managing some of the flight instrument tables. It also provides anomaly investigation support, as needed.

Similarly the Spacecraft Support Node includes the infrastructure to support spacecraft sustainment operations. SSN includes the Flight Project Observatory Manager, spacecraft vendors, as well as relevant system and discipline engineers from the Flight project. The SSN maintains and updates the spacecraft flight software and tables. It also provides anomaly investigation support, as needed.

1.6 Mission and Project Objectives

Polar-orbiting satellites meet many current and near-term national operational environmental sensing requirements for continuous observation of Earth's environment by performing four major functions:

- Provide environmental sensing from polar sun-synchronous orbit
- Provide Data Collection Service capability
- Broadcast environmental data to distributed users
- Relay distress signals from aircraft or marine vessels to search and rescue ground stations

Subsequently, the objective of JPSS Ground System is to manage a fleet of polar-orbiting environment sensing satellites and to acquire, route, process and distribute operational weather and climate data collected from polar-orbiting sensors to meet the needs of NASA, NOAA, DoD, EUMETSAT, JAXA, and FT users.

1.7 Document Organization

Section 1	provides information regarding the scope, purpose, background and organization of this document.
Section 2	lists parent, applicable, and information documents that were used as sources of information for this document or that provide additional background information to aid understanding of the requirements.
Section 3	provides the JPSS Ground System Requirements
Appendix A	contains the Requirements Attributes table
Appendix B	JPSS-1 Mission Requirements

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.

Document Number	Title
JPSS-REQ-1001	Joint Polar Satellite System (JPSS) Program Level 1 Requirements Document
JPSS-REQ-1002	Joint Polar Satellite System (JPSS) Program Level 1 Requirements Supplement

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.

Document Number	Title
470-00094	Joint Polar Satellite System (JPSS) Ground System Security Requirements Document (GSSRD)
470-00019	Joint Polar Satellite System (JPSS)-1 Mission System Specification
470-00067-02	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD) Volume 2 - Science Products Specification
474-00200	Joint Polar Satellite System (JPSS) Common Ground System (CGS) to Government Resource for Algorithm Verification, Independent Testing, and Evaluation (GRAVITE) Interface Requirements Document (IRD)
474-00300	Joint Polar Satellite System (JPSS) Ground System (GS) to Conjunction Assessment Interface Requirements Document (IRD)
474-00990	Government Resource for Algorithm Verification, Integration, Test and Evaluation (GRAVITE) to STAR Central Data Repository (SCDR) Interface Requirement Document (IRD)
474-REF-00401	Meteorological Operational Satellite (MetOp) Network Requirements Document
474-REF-00803	JPSS-1 Network Requirements Document
474-REF-00663	EUMETSAT EPS - NOAA ADA Operations Interface Control Document
474-REF-00651	Space Network (SN) to JPSS C3S ICD
LSP-PLN-333.01-JPSS-1-LSSP	JPSS-1 Launch Site Support Plan
474-00109	Joint Polar Satellite System (JPSS) Ground System (GS) to Kongsberg Satellite Services KSAT) Interface Requirements Document (IRD)

Document Number	Title
474-00302	Joint Polar Satellite System (JPSS) Ground System (GS) to Comprehensive Large Array-Data Stewardship System (CLASS) Interface Requirements Document (IRD)
474-00303	Joint Polar Satellite System (JPSS) Ground System (GS) to National Environmental Satellite, Data, and Information Service (NESDIS) Environmental Satellite Processing Center (ESPC) Interface Requirements Document (IRD)
474-00306	Joint Polar Satellite System (JPSS) Ground System (GS) to NOAA Space Operations Facility (NSOF) Facilities Interface Requirements Document (IRD)
474-00304	Joint Polar Satellite System (JPSS) Ground System (GS) to National Aeronautics and Space Administration (NASA) Science Data Segment (SDS) Interface Requirements Document (IRD)
470-00021	Joint Polar Satellite System (JPSS) Program Threat Assessment
470-00022	Joint Polar Satellite System (JPSS)-1 Space Asset Protection Plan
474-00315	Joint Polar Satellite System (JPSS) Ground System (GS) to NAVOCEANO Interface Requirements Document (IRD)
474-00314	Joint Polar Satellite System (JPSS) Ground System (GS) to FNMOC Interface Requirements Document (IRD)
470-00028	Joint Polar Satellite System (JPSS) Spacecraft Ka-band Stored Mission Data (SMD) Interface Requirements Document (IRD) to the Distributed Receptor Network (DRN)
NIST-800-53 Rev 3	National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53 Rev 3
	Federal Information Security Management Act (FISMA) of 2002
474-00102	Command, Control, and Communications Segment (C3S) Interface Control Document (ICD) With Svalbard Site
429-11-02-156	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Conjunction Assessment Technical Description Document
474-00115	Joint Polar Satellite System (JPSS) Flight Vehicle Simulator (FVS) to Command, Control, and Communications Segment (C3S) Interface Control Document (ICD)
429-03-02-25	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Spacecraft S-Band Radio Frequency Interface Control Document (ICD) to the Norway Ground Station
429-04-02-27	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) S-Band Data Format Interface Control Document (ICD)
429-03-02-26	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Spacecraft Stored Mission Data (SMD) Interface Control Document (ICD) to the Norway Ground Station
429-03-02-24	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Spacecraft High Rate Data RF Interface Control Document (ICD) to the Direct-Broadcast Stations
474-00098	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) Flight Software and Table Update Delivery Process

Document Number	Title
429-04-02-28	National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) X-Band Data Format Interface Control Document (ICD)
TBD	Consultative Committee for Space Data Systems (CCSDS) AOS Spec (TBD)
474-REF-00651	Joint Polar Satellite System (JPSS) Command, Control, and Communications Segment (C3S) Interface Control Document (ICD)
474-REF-00390	NPP Network Requirements Document
474-REF-00803	JPSS-1 Network Requirements Document
474-REF-00401	Meteorological Operational Satellite (MetOp) Network Requirements Document (NRD)
470-REF-00033	Memorandum of Understanding (MOU) Between National Oceanic and Atmospheric Administration (NOAA) and Japanese Aerospace Exploration Agency (JAXA) in Relation to the Cooperation for the GCOM-W1
602-04-1AC02	Agreement Between National Oceanic and Atmospheric Administration (NOAA) and European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) for Joint Transition Activities (JTA)
	Agreement Between The United States National Oceanic And Atmospheric Administration and the European Organization For the Exploitation of Meteorological Satellites on a Joint Polar System
	Memorandum of Agreement Between the Department of the Navy and the National Polar-Orbiting Operations Environmental Satellite System (NPOESS) Integrated Program Office (IPO) for the Development, Launch, Operation and Technology Transfer of WindSat
	Agreement Between National Oceanic And Atmospheric Administration (NOAA) and NSC on Cooperation (11/28/08 & 4/2/02)
	Polar-orbiting Operational Environmental Satellite (POES)/Kongsberg Satellite Services (KSAT) Service Level Agreement (SLA)
	Concept of Operations (ConOps) for Defense Meteorological Satellite Program (DMSP) Operations
	Memorandum of Understanding (MOU) Between SCaN and National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite, Data, and Information Service (NESDIS)
	Memorandum of Agreement (MOA) Between National Polar-Orbiting Operational Environmental Satellite System (NPOESS) and National Science Foundation (NSF) Regarding use of McMurdo
	Memorandum of Understanding between the Space Communications and Navigation (SCaN) Office of the Human Exploration and Operations Mission Directorate of the National Aeronautics and Space Administration (NASA) and the JPSS Program Office of the NOAA regarding Polar Telecommunications Services
	Memorandum of Agreement between: Headquarters Air Force Space Command (AFSPC) the National Oceanic and Atmospheric Administration (NOAA)
GPD 7120.1	Goddard Space Flight Center (GSFC) Space Asset Protection Policy
NPD 7120.4	NASA Engineering and Program/Project Management Policy
NPR 8705.4	Risk Classification for National Aeronautics and Space Administration (NASA) Payloads
NPR 8715.6A	National Aeronautics and Space Administration (NASA) Procedural

Document Number	Title
	Requirements for Limiting Orbital Debris
NASA-STD-8719.14	National Aeronautics and Space Administration (NASA) Process for Limiting Orbital Debris
NIMA TR-8350.2	Department of Defense (DoD) World Geodesic System 1984 Technical Report
IETF RFC-2460	Internet Protocol
474-00305	Joint Polar Satellite System (JPSS) Ground System (GS) to National Environmental Satellite, Data, and Information Service (NESDIS)/Fairbanks Command and Data Acquisition Station (FCDAS) Interface Requirements Document (IRD)
	McMurdo Station Antarctica Data Communications Services PSLA
IS-DMSP-853A	Interface Specification Space Segment to Ground System of the Defense Meteorological Satellite Program (DMSP)
474-00308	Joint Polar Satellite System (JPSS) Ground System (GS) to Defense Meteorological Satellite Program (DMSP) Interface Requirements Document (IRD)
474-00310	Joint Polar Satellite System (JPSS) Ground System (GS) to National Environmental Satellite, Data, and Information Service (NESDIS) Consolidated Backup (CBU) Facilities Interface Requirements Document (IRD)
474-00311	Joint Polar Satellite System (JPSS) Ground System (GS) to National Science Foundation (NSF) Interface Requirements Document (IRD)
474-00313	Joint Polar Satellite System (JPSS) Ground System (GS) to Coriolis/WindSat Interface Requirements Document (IRD)
474-00223	Joint Polar Satellite System (JPSS) Ground Project (GP) to the JPSS Flight Project (FP) Interface Requirements Document (IRD)
474-00306	Joint Polar Satellite System (JPSS) Ground System (GS) to NSOF Facilities Interface Requirements Document (IRD)
474-00222	Joint Polar Satellite System (JPSS) Common Ground System (CGS) to Flight Vehicle Test Suite (FVTS) Interface Requirements Document (IRD)
474-00316	Joint Polar Satellite System (JPSS) Common Ground System (CGS) to Attitude Ground System (AGS) Interface Requirements Document (IRD)
474-00307	Joint Polar Satellite System (JPSS) Ground System (GS) to National Aeronautics and Space Administration (NASA) Space Communications and Navigation (SCaN) Interface Requirements Document (IRD)
474-00309	Joint Polar Satellite System (JPSS) Ground System (GS) to European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Interface Requirements Document (IRD)
474-00367	Suomi-National Polar-orbiting Partnership (S-NPP/Flight Vehicle Simulation (FVS) to Joint Polar Satellite System (JPSS) Common Ground System (CGS) Interface Control Document (ICD)
472-00160	Joint Polar Satellite System (JPSS)-1 Spacecraft Telemetry Tracking & Command to Ground Segment Radio Frequency Interface Control Document (ICD)
472-00162	Joint Polar Satellite System (JPSS)-1 Spacecraft Stored Mission Data (SMD) to Ground Segment Radio Frequency Interface Control Document (ICD)
472-00164	Radio Frequency Interface Control Document (RFICD) Joint Polar Satellite System-1 (JPSS-1) Spacecraft and the Space Network (SN) and the Near Earth Network (NEN) (ICD)

Document Number	Title
472-00165	JPSS-1 Spacecraft High Rate Date (HRD) to Direct Broadcast Stations (DBS) Radio Frequency (RF) Interface Control Document (ICD)
450-PSLA-NPP	NISN Mission Operations Memorandum of Agreement (MOA) between National Aeronautics and Space Administration (NASA)/NISN and NOAA/NESDIS for the Management and Operations of a Custom Mission Service and NISN Point of Presence Router supporting NPP and the Project Service Level Agreement
450-PSLA-JPSS	NISN Mission Operations MOA between NASA/NISN and NOAA/NESDIS for the Management and Operations of a Custom Mission Service and NISN Point of Presence Router supporting NPP and the JPSS-1 Project Service Level Agreement
NOAA5042	Joint Polar Satellite System (JPSS) Contingency Plan (CP)
472-00251	Mission Data Format Control Book Joint Polar Satellite System-1 (JPSS-1) (MDFCB)
429-05-02-42	Mission Data Format Control Book National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) MDFCB)
474-00448-02-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Common Algorithms
474-00448-02-02	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the ATMS RDR/TDR/SDR
474-00448-02-03	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the CrIS RDR/SDR
474-00448-02-04	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the OMPS TC RDR/SDR
474-00448-02-05	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the OMPS NP RDR/SDR
474-00448-02-06	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the VIIRS RDR/SDR
474-00448-02-07	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Ancillary Data Handling
474-00448-02-08	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Geolocation and Spacecraft Orientation
474-00448-02-09	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the CERES RDR
474-00448-02-10	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Active Fires
474-00448-02-11	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Cloud Mask
474-00448-02-12	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Aerosol Products
474-00448-02-14	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Cloud Optical Properties Products
474-00448-02-15	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Surface Reflectance
474-00448-02-16	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Cloud Physical Properties
474-00448-02-17	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data

Document Number	Title
	Dictionary for the Cryosphere Products
474-00448-02-18	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Vegetation Index
474-00448-02-19	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Surface Type
474-00448-02-20	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Surface Albedo
474-00448-02-21	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Surface Temperature
474-00448-02-22	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Ozone Nadir Profile EDR
474-00448-02-23	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Ozone Total Column EDR
474-00448-02-24	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Ocean Color and Chlorophyll
474-00448-02-25	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the SST
474-00448-02-26	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the VIIRS Imagery
474-00448-02-28	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the OMPS Limb RDR
474-00448-02-29	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the Snow Cover
474-00448-02-30	Joint Polar Satellite System (JPSS) Algorithm Specification Volume II: Data Dictionary for the AMSR-2 RDR
NIST FIPS PUB 140-2	National Institute of Standards and Technology Federal Information Processing Standards Security Requirements for Cryptographic Modules
ITU-R TF.460-6	International Telecommunications Union-Radio Communication Sector (ITU-R), Standard-frequency and time-signal emissions, 02/02
472-00173	Joint Polar Satellite System (JPSS) Interface Requirements Document (IRD) for RF Interfaces To and From the JPSS-1 Satellite
474-REF-00145	GCOM-W1 Mission Operations Interface Specification (MOIS) Rev. 10
	JPSS-1 Launch Site Support Plan
	JPSS-2 Launch Site Support Plan

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.

Document Number	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 (ConOps)
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon
CCSDS 131.0-B-1	Recommendation for Space Data Systems Standards. TM Synchronization and Channel Coding. Blue Book Issue 1

Document Number	Title
CCSDS 132.0-B-1	Recommendation for Space Data Systems Standards. TM Space Data Link Protocol. Blue Book. Issue 1.
CCSDS 133.0-B-1	Recommendation for Space Data Systems Standards. Space Packet Protocol. Blue Book. Issue 1.
CCSDS 231.0-B-1	Recommendation for Space Data Systems Standards. TC Synchronization and Channel Coding. Blue Book. Issue 1
CCSDS 232.0-B-1	Recommendation for Space Data Systems Standards. TC Synchronization and Channel Coding. Blue Book. Issue 1.
CCSDS 232.1-B-1	Recommendation for Space Data Systems Standards. Communications Operations Procedure-1. Blue Book Issue 1
CCSDS 401.0-B	Recommendation for Space Data Systems Standards. Radio Frequency and Modulation Systems. Blue Book Issue 17
CCSDS 727.0-B-4	Recommendation for Space Data Systems Standards. CCSDS File Delivery Protocol (CFDP). Blue Book Issue 4
CCSDS 911.1-B-2	Consultative Committee for Space Data Systems (CCSDS) Space Link Extension (SLE) – Return All Frames Service Specification
CCSDS 911.1-B-3	Consultative Committee for Space Data Systems (CCSDS) Space Link Extension (SLE) – Return All Frames Service Specification
CCSDS 911.2-B-2	Consultative Committee for Space Data Systems (CCSDS) Space Link Extension (SLE) – Return Channel Frames Service Specification
CCSDS 912.1-B-2	Consultative Committee for Space Data Systems (CCSDS) Space Link Extension (SLE) – Forward Communications Link Transmission Unit (CLTU) Service Specification
	MOA between the Department of the Navy and the NPOESS IPO for the Development, Launch, Operation and Technology Transfer of WindSat.
	MOU: The Space Communications and Navigation Office of the Human Exploration and Operations Mission Directorate of the NASA and the JPSS Program Office of the NOAA regarding Polar Telecommunications Services

3 REQUIREMENTS

The requirements in the following sections are grouped by functional node of the JPSS Ground System. Inside each functional node section, the requirements are further organized and mapped to Level 2 Operational Activities.

Functional nodes support unique Level 2 Operations Activities. Each Level 2 Operations Activity in turn is decomposed into Level 3 Operations Activities, which are then used to develop the L3 Concept of Operations threads defined in document 474-00XXX.

The following sections bin the requirements by L2 Operations Activity, which form the subsections of the node specific requirements sections.

Section 3.1 covers general requirements common across nodes.

Section 3.2 covers JPSS Ground System external and internal interface definitions

Section 3.3 covers the Space/Ground Communications Node requirements, by L2 Operations Activity

Section 3.4 covers the Ground Networks Node requirements, by L2 Operations Activity

Section 3.5 covers the Management and Operations Node requirements, by L2 Operations Activity

Section 3.6 covers the Data Processing Node requirements, by L2 Operations Activity

Section 3.7 covers the Simulation Node requirements, by L2 Operations Activity

Section 3.8 covers the Calibration/Validation Node requirements, by L2 Operations Activity

Section 3.9 covers the Field Terminal Support Node requirements, by L2 Operations Activity

Section 3.10 covers the Continuity of Operations requirements, by L2 Operations Activity

Section 3.11 covers the Ground System Security Node requirements, by L2 Operations Activity

Table 3-1 provides a mapping of JPSS Ground System Nodes to L2 and L3 Operations activities. Appendix TBD provides a matrix of L2 requirements to L3 Concept of Operation Threads. It is this mapping of L3 Threads to L2 requirements which will form the basis of the L2 Verification Approach.

Table: 3-1 JPSS Ground System Node Mapping to L2 and L3 Operations Activities

Node	L2 Super Activity	L3 Activities
Space/Ground Communications Node	Uplink Processing	Transmit Space/Ground Communications
	Downlink Processing	Preprocess Downlink Data
		Receive Space/Ground Communications
	Direct Broadcast Monitoring	HRD Monitoring
	Manage Ground Station	Configure Ground Station
		Manage Space/Gnd Comm Node State of Health
Ground Network	Manage Ground Networks	Configure Network Routing

Node	L2 Super Activity	L3 Activities
Node		
		Manage Ground Network State of Health
	Provide Distributed Communications	Route uplink/downlink data (Route Downlink Data)
		Provide Voice & Video Communications
		Maintain Mission Support Data
		Collect Mission Support Data
		Distribute Mission Support Data
Management & Operations Node	Fleet/Ground Operations	Manage Fleet/Ground Operations
		Determine Ground System Impacts
	Flight Operations	Execute Satellite Commands & Loads
		Validate FSW & Table Loads
		Generate & Validate Satellite CMD
		Monitor Spacecraft Contacts
		Schedule non-JPSS Space/Ground Communications
		Acquire Orbit Maneuver Support
		Check RT-TLM Limits
		Determine Satellite State for Simulator Configuration
		Manage Flight SW Versions
		Manage SSR
		Process & Extract Telemetry
		Ingest Telemetry
		Manage TLM Data
		Manage Satellite State of Health
	Orbital/Attitude Management	Acquire Orbit Support Data
		Monitor/Calibrate Orbit
		Plan Maneuvers
		Check Orbit Control Limit
		Predict Orbit Events
		Distribute Orbit Products
		Monitor/Validate Attitude Control
		De-orbit spacecraft
	Analysis and Trending	Trend Flight System State of Health
		Trend Ground System State of Health
		Verify Post-update Operation
	Ground Operations	Execute Ground Commands
		Generate & Validate Ground Equipment Commands
		Monitor Direct Broadcast Performance
		Verify Ground Configuration

Node	L2 Super Activity	L3 Activities
		Track Mission Data Flow
		Recover Mission Data
		Manage S/C CMD Keys
		Manage Mission Support Data
		Configure Test String for Simulation Support
		Maintain Ground System
		Manage GSystem State of Health
		Manage GSystem Services
	Mission Planning	Process Mission Activity & Task Requests
		Deconflict Master Schedule
		Generate Implementation Plans
		Collect External Contact Plans
		Determine View Period
	Manage M&O Node	Manage M&O Node State of Health
GENERAL (M&O)	Training	Support Operations Training
		Support Maintenance Training
	Upgrade System	Evaluate MON, GNN & S/GCN Update
		Transition MON, GNN & S/GCN Update to Operations
		Monitor MON, GNN & S/GCN SW Installation
Continuity of Operations	Provide Continuity of Operations	Synchronize Data between MON & AltMON
Data Processing Node	Collect Data Product Inputs	Ingest Mission Data
	Produce Data Products	Produce Data Products
	Distribute Data Products	Distribute Data Products
	Manage Data Processing	Manage Product Generation & Distribution
		Manage Data Processing Node State of Health
	Data Assurance	Evaluate Product Quality
		Check Internal Consistency of Data
		Analyze Data Processing Metrics
		Notify Users
		Receive Monitoring Requests
		Modify Local Thresholds
GENERAL (DP Node)	Upgrade System	Transition Update to Operations
		Evaluate DPN Update
Continuity of Operations	Provide Continuity of Operations	Synchronize Data between Primary and Backup DPN

Node	L2 Super Activity	L3 Activities
Simulation Node	Simulate Flight Operations	Simulate Flight Vehicle
		Check Calculated Maneuver Parameters
		Change HiFi Sim Active CMD Key
	Manage Simulators	Manage & Configure Simulators
Calibration/Validation Node	Acquire Cal/Val Data	Request Data for Cal/Val
		Receive Notices for Cal/Val
		Ingest Data
	Maintain & Calibrate Algorithms	Verify Algorithm Updates
		Track Discrepancy Reports
		Schedule Cal/Val Product Generation Executives
		Generate Cal/Val Products
		Evaluate Instrument Data
		Maintain Algorithms
		Request Monitoring Changes
		Forward Recommended Updates
		Evaluate Calibration System
		Evaluate & Improve Geolocation Accuracy
		Evaluate & Improve Instrument/Algorithm Performance
		Trend Product Performance and Telemetry
	Manage Cal/Val Node	Manage Cal/Val Infrastructure
		Manage Cal/Val Products
		Distribute Cal/Val Products & Findings
		Generate / Maintain Cal/Val Tools
Field Terminal Support	Support FT Operations	Distribute HRD Reports
		Distribute FTS Support Products
		Acquire FT Support Data
		Modify & Distribute Monitoring Thresholds
		Receive Configuration Data
	Support FT Software	Modify and Distribute to FT Users
		Receive Software Updates
		Develop Science Processing Algorithm from ADL
CGS Support Node	L3 Node	Manage Baseline Data Quality Threshold
		Factory Verify Software Updates
		Distribute SW Updates
		Track Issues/Process PCRs

Node	L2 Super Activity	L3 Activities
		Develop SW
		Plan HW updates
		Develop & Execute Factory Tests
		Pre-launch testing / check-out
		Manage S/C CMD Keys
		Analyze Simulation Data

3.1 General Requirements

3.1.1 JPSS Missions

GSR-795 The JPSS Ground System shall provide concurrency of operations.

Rationale: The Ground System must support multiple missions concurrently which include: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, and NSF. FVTS, FTS, AGS and GRAVITE are only required to support S-NPP, JPSS-1 and JPSS-2.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.1.2 Fleet Ground Management

GSR-71 The JPSS Ground System shall manage JPSS satellites as an integrated fleet.

Rationale: The JPSS Ground System must be designed to efficiently schedule, configure, monitor and assess JPSS-managed satellites from an integrated and adaptable ground system architecture. Console positions and operator activities must be seamlessly configurable in order to focus in on any one satellite.

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

GSR-302 The JPSS Ground System shall generate State of Health (SOH) data for all JPSS Ground System functional nodes.

Rationale: All functions of the JPSS Ground System must provide real-time monitoring of the State of Health. After collecting status information, it must be compared with associated limits to generate state of health indications for each asset to ensure optimal performance. Ground operations will perform necessary functions on this data. FTS provides the HRD monitor which must generate SOH information.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-395 The JPSS Ground System shall ensure operations have complete and timely reporting on scheduled activity preparation, execution and performance.

Rationale: This is State of Services. JPSS operations are performed by way of scheduled mission specific and general JPSS operations activities deployed to JPSS locations and resources. A key aspect of situational awareness is confirming the activities and related resource configurations are prepared in advance, execute the activity as planned, and report on the general performance of the activity. Timeliness will be defined in the level 3 requirements.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-396 The JPSS Ground System shall ensure operations have complete and timely reporting on faults within the JPSS-managed flight/ground resources.

Rationale: Operations must be notified of faults occurring anywhere within JPSS-managed resources to support operational availability.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-397 The JPSS Ground System shall ensure operations have complete and timely reporting on JPSS-managed Flight/Ground resources experiencing degraded capacity.

Rationale: In order to ensure JPSS operational availability, data availability and data quality operations must be notified of reduced capacity from nominal levels occurring anywhere within JPSS-managed resources. This includes maintenance, environmental, and upgrade activities.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-126 The JPSS Ground System shall provide JPSS operators with an integrated set of displays that provide global situational awareness for all JPSS-managed flight/ground assets.

Rationale: Integrated operational global situational awareness for space and ground JPSS-managed resources is imperative. The separation of space and ground asset status has been a cause of problems in the past.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-107 The JPSS Ground System shall provide automated control of JPSS operational resources.

Rationale: Automated control can occur when the response time for the expected scheduled service traffic cannot be reliably supported by manual operations. In addition, automated control may occur to allow for execution of sequences when violations of thresholds occur. Any automated control capability must have a manual override. Automated control is necessary for all resources involved with data production, from downlink to final products. However, automated control is not required for test and training.

Mission Effectivity: S-NPP, DMSP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-108 The JPSS Ground System shall provide manual control of JPSS operational resources.

Rationale: Although automated processes can improve efficiency and reliability of execution, when automated systems fail the operators must have the ability to reconfigure components to establish service even if those methods are not preferred for normal operations. This includes manual control for both space and ground components.

Mission Effectivity: S-NPP, DMSP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

3.1.3 Space Asset Protection

GSR-63 For nominal operations, the JPSS Ground System shall encrypt commands to the S-NPP satellite using Caribou encryption.

Rationale: The JPSS Ground System must comply with GPD 7120.1A, GSFC Space Asset Protection Policy, for the protection of GSFC-managed space missions. Caribou encryption is used on S-NPP.

Mission Effectivity: S-NPP

GSR-1558 For nominal operations, the JPSS Ground System shall encrypt the commands to the JPSS-managed satellites using a NIST FIPS 140-2 certified AES algorithm uplink security system that uses 256 bit keys.

Rationale: GPD 7120.1A (GSFC Space Asset Protection Policy) establishes the policy for the protection of GSFC-managed space missions. The command link design should not be susceptible to contact from sources other than the JPSS mission operations control centers.

Mission Effectivity: JPSS-1, JPSS-2

GSR-252 The JPSS Ground System shall ensure all flight commands for JPSS-managed satellites have been authenticated prior to execution.

Rationale: GPD 7120.1A (GSFC Space Asset Protection Policy) establishes the policy for the protection of GSFC-managed space missions.

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

3.1.4 JPSS Ground System Design

GSR-466 The JPSS Ground System shall have an operational life through at least FY 2025.

Rationale: The overall design and architecture must support periodic technical refreshes and upgrades to ensure an operational life through at least FY 2025 can be met.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.1.5 Independent Development and Test Capability

GSR-830 The JPSS Ground System shall control data flows between the operational environment and other environments.

Rationale: There may be times when data must be transferred from the operational environment to another environment (e.g., training) or from another environment to the operational environment (e.g., software patch). The controls for allowing those transfers must be both physical and procedural.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, NSF

GSR-831 The JPSS Ground System shall provide the functionality to perform simulations, integration and testing without impact to operations.

Rationale: The JPSS Ground System is required to operate for 12 years. Development and integration and test activities cannot interrupt operations. Consequently those activities, which are required for system evolution and maintenance, must be performed during non-operational periods or on independent functional capabilities isolated from the operational systems. This also applies to algorithm development and maintenance.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, NSF

3.1.6 Units, Formats and Standards

GSR-3260 The JPSS Ground System shall utilize a reliable transmission protocol.

Rationale: The system must use a reliable protocol to ensure SMD delivery. Not applicable to space/ground link where the transmission protocols are controlled by the flight project.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-149 The JPSS Ground System shall use WGS 84 as the geodetic system in accordance with the Department of Defense World Geodetic System 1984 Technical Report, (NIMA TR-8350.2).

Rationale: WGS-84 has been designated the geodetic reference system for the JPSS Ground System.

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

GSR-292 The JPSS Ground System shall employ a system time convention based on the US Naval Observatory (USNO) definition of Coordinated Universal Time [UTC (USNO)] in accordance with the ITU-R TF.460-6, Standard-frequency and time-signal emissions including the leap second convention.

Rationale: UTC is the time format distributed and utilized worldwide and can be readily obtained from the Global Positioning Satellites (GPS).

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-293 The JPSS Ground System on-orbit coordinate system shall use a right-hand, orthogonal, body-fixed XYZ coordinate system as follows: the +Z axis is downward towards nadir, the Y-axis is along the orbit normal plane (+Y is opposite the orbital angular momentum), and the X-axis is along the spacecraft velocity vector (+X toward the direction of spacecraft travel).

Rationale: A common reference frame is necessary to ensure compatibility with heritage coordinate systems (e.g. S-NPP) for Earth-observing spacecraft.

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

GSR-294 The JPSS Ground System shall be IPV6 capable.

Rationale: IPV6 is the current standard for Internet Protocols and the ground system must be current with accepted industry practices when possible. Standards for Internet Protocol routing are defined in accordance with IETF RFC 2460 - Internet Protocol. IPv6 compatibility is required in accordance with US Executive Order 893, effective June 2010. Applies to everything that does not go through the NOAA Trusted Internet Connection (TIC).

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-295 The JPSS Ground System shall use the Earth-centered J2000 inertial coordinate system for attitude knowledge and orbit reference.

Rationale: Reference frame knowledge is required for accurate data location and processing.

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

GSR-296 The JPSS ground system shall exclusively use lossless data compression techniques when data must be compressed.

Rationale: The resolution of data must not be degraded from the resolution it is acquired from a spacecraft. If compression is used, it must be a lossless process; i.e. RLL encoding is acceptable for images while JPEG compression is not acceptable. This does not include the use of imaging or video compression for higher level weather and climate data products.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-3213 The JPSS Ground System shall implement the CCSDS Space Link Extension in accordance with the following CCSDS SLE Return Service and Forward Service Specifications:

A. Return All Frames Service Specification

B. Return Channel Frames Service Specification

C. Forward CLTU Service Specification

Rationale: Use of the CCSDS standards ensures uniformity at the numerous ground stations and precludes the need to provide mission-specific hardware at each ground station location.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1692 The JPSS Ground System shall use the metric system of measurement as required by NPD 7120.4D, NASA Engineering and Program/Project Management Policy.

Rationale: NASA policy mandates the use of the metric system. Waivers may be required for heritage systems.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.1.7 Ground System Performance

GSR-3307 The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to FNMOC Point of Presence measured over a 30-day period.

Rationale: Raw Data Availability (RDA) is defined as the number of Application Packets (APs) provided to FNMOC versus the number of expected APs minus exceptions. The number of expected APs is what stored on the SSR. The exceptions include APs not requested by FNMOC or not delivered due to interface outages for which FNMOC is responsible.

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

GSR-3308 The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to NAVOCEANO Point of Presence measured over a 30-day period.

Rationale: Raw Data Availability (RDA) is defined as the number of Application Packets (APs) provided to NAVOCEANO versus the number of expected APs minus exceptions. The number of expected APs is what stored on the SSR. The exceptions include APs not requested by NAVOCEANO or not delivered due to interface outages for which NAVOCEANO is responsible.

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

GSR-3369 For GCOM-W1, the JPSS Ground System shall make at least 99.9% of the SMD captured at the ground RF receiving point available to the FNMOC Point of Presence measured over a 30-day period.

Rationale: Raw Data Availability (RDA) is defined as the number of Application Packets (APs) made available to FNMOC versus the number of expected APs minus exceptions. The number of expected APs is what captured at the ground RF receiving point. The exceptions include APs not requested by FNMOC or not delivered due to interface outages for which FNMOC is responsible.

Mission Effectivity: GCOM-W1

GSR-3370 For GCOM-W1, the JPSS Ground System shall make at least 99.9% of the SMD captured at the ground RF receiving available to the NAVOCEANO Point of Presence measured over a 30-day period.

Rationale: Raw Data Availability (RDA) is defined as the number of Application Packets (APs) made available to NAVOCEANO versus the number of expected APs minus exceptions. The number of expected APs is what captured at the ground RF receiving point. The exceptions include APs not requested by NAVOCEANO or not delivered due to interface outages for which NAVOCEANO is responsible.

Mission Effectivity: GCOM-W1

GSR-1246 The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to the Comprehensive Large Array-data Stewardship System (CLASS) measured over a 30-day period.

Rationale: Raw Data Availability (RDA) is defined as the number of Application Packets (APs) contained in the RDRs provided to CLASS versus the number of expected APs minus

exceptions. The number of expected APs is what stored on the SSR for the RDR production. The exceptions include APs not requested by CLASS or not delivered due to interface outages for which CLASS is responsible.

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

GSR-3383 The JPSS Ground System shall provide at least 99% of all deliverable products to the Comprehensive Large Array-data Stewardship System (CLASS) measured over a 30-day period.

Rationale: Product Data Availability (APD) is defined as the number of data products provided to CLASS versus the number of expected deliverable products minus exceptions. The expected products include granule-based xDRs that should be generated from the APs stored on the SSR, deliverable IPs, ancillary and auxiliary data. The exceptions include products not requested by CLASS or not provided due to interface outages for which CLASS is responsible.

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

GSR-3384 The JPSS Ground System shall provide at least 99% of all deliverable products to ESPC measured over a 30-day period.

Rationale: Product Data Availability (APD) is defined as the number of data products provided to ESPC versus the number of expected products minus exceptions. The expected products include granule-based xDRs that should be generated from the APs stored on the SSR, deliverable IPs, ancillary and auxiliary data. The exceptions include products not requested by ESPC or not provided due to interface outages for which ESPC is responsible.

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

GSR-3385 The JPSS Ground System shall provide at least 99% of all deliverable products to SDS measured over a 30-day period.

Rationale: Product Data Availability (APD) is defined as the number of data products provided to SDS versus the number of expected products minus exceptions. The expected products include granule-based xDRs that should be generated from the APs stored on the SSR, deliverable IPs, ancillary and auxiliary data. The exceptions include products not requested by SDS or not provided due to interface outages for which SDS is responsible.

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

GSR-3309 The JPSS Ground System shall make APs from S-NPP available to the user's Point of Presence (PoP) within 120 minutes of the observation time for at least 95% of the APs intended for that user measured over a 30-day period.

Rationale: Latency is measured from the observation time of the packet to the timestamp of the acknowledgement of successful delivery of the packet to the user's landing zone. Assumes that AP deliveries are file-based and not filtered. Note that user's PoP is local at NSOF and CBU and JPSS does not provide the network. The S-NPP AP users include FNMOC and NAVOCEANO.

The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The

exceptions include repaired APs provided on late requests and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: S-NPP

GSR-3310 The JPSS Ground System shall make APs from JPSS-1/JPSS-2 available to the user's Point of Presence within 70 minutes of the observation time for at least 95% of the APs intended for that user measured over a 30-day period.

Rationale: Latency is measured from the observation time of the packet to the timestamp of the acknowledgement of successful delivery of the packet to user's landing zone. Assumes that AP deliveries are file-based and not filtered. Note that user's PoP is local at NSOF and CBU and JPSS does not provide the network. The JPSS AP users include FNMOC and NAVOCEANO.

The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired APs provided on late requests and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: JPSS-1, JPSS-2

GSR-1422 The JPSS Ground System shall make JPSS EDRs available at the JPSS GS interface for each official external mission data consumer within 80 minutes of the observation time for at least 95% of the EDRs generated over a 30-day period.

Rationale: Latency is measured from the observation time of the latest sensor data used in the creation of the EDR to the timestamp of the acknowledgement of successful delivery of the EDR to the user's landing zone. The 95% is an aggregate of all EDRs defined as the primary operational set of data products. Products are defined in the GSRD Volume 2.

Official external mission data consumers (users) include the NESDIS ESPC, CLASS, SDS, and GRAVITE.

The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay.

The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: JPSS-1, JPSS-2

GSR-3391 The JPSS Ground System shall provide at least 99% of all requested deliverable products to GRAVITE measured over a 30-day period.

Rationale: Product Data Availability is defined as the number of data products provided to GRAVITE vs. the number of expected deliverable products minus exceptions. The expected

products include MSD produced by or made available to CGS, deliverable IPs, and granule-based xDRs that should be generated from the APs stored on the SSR. The exceptions include products not requested by GRAVITE or not provided due to interface outages for which GRAVITE is responsible. This requirement is applicable per the following deliverable product categories: RDR, SDR, TDR, EDR, IP, and MSD.

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

GSR-1696 The JPSS Ground System shall provide at least 99.9% of the GCOM-W1 SMD captured at the ground RF receiving point to CLASS measured over a 30-day period.

Rationale: Raw Data Availability (ARD) is defined as the number of Application Packets (APs) contained in the RDRs provided to CLASS versus the number of expected APs minus exceptions. The number of expected APs is what received at the ground RF receiving point for the RDR production. The exceptions include APs not requested by CLASS or not delivered due to interface outages for which CLASS is responsible.

Mission Effectivity: GCOM-W1

GSR-1243 The JPSS Ground System shall meet an operational availability (Ao) of 99% measured over a 30-day period.

Rationale: 99% is the operational availability requirement for the JPSS Ground System. Each node of the ground system is allocated an individual Ao reflecting the total number of missions being supported.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

Note: We aggregated the Ao's for each node in the general section to assist in reviewing the GSRD. May move these requirements to the node sections in a future release.

GSR-1554 The JPSS Ground System Space/Ground Communications Node shall have an operational availability (Ao) of 99.5% measured over a 30-day period.

Rationale: This node is required continuously (i.e., 24/7) to support operations. The aggregate Ao is 99.5% based on MMSC requirements.

Availability of the node encompasses availability of interfaces associated with this node.

Mission Effectivity: DMSP

GSR-1306 The JPSS Ground System's Ground Network Node shall provide WAN services with a 99.9% Ao measured over a 30-day period.

Rationale: This node is required continuously (i.e., 24/7) to support operations. Availability of the node encompasses availability of interfaces associated with this node.

Mission Effectivity: S-NPP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-3352 The JPSS Ground System Ground Network Node shall have an operational availability from McMurdo for each effective mission of at least a 99.5% Ao measured over a 30-day period.

Rationale: Ao only applies to equipment or services that is owned or managed by the JPSS Ground System. Ao is defined as the availability needed to maintain satellite safety and to provide products and services for the JPSS missions. The products are to be provided within the required data latency. An outage (planned and unplanned) does not count against the Ao as long as the satellite safety and timely product delivery and services are not affected. This includes routing data through alternate/backup paths to restore mission operations. Specific service segments are:

- NSF: McMurdo to Centennial
- METOP: McMurdo to Darmstadt
- DMSP: McMurdo to AFWA
- SCaN: McMurdo to GSFC

Mission Effectivity: DMSP, Metop, SCaN, NSF

GSR-1307 The JPSS Ground System Management and Operations Node shall have an operational availability (Ao) of 99.9% measured over a 30-day period.

Rationale: This node is required continuously (i.e., 24/7) to support operations. Availability of the node encompasses availability of interfaces associated with this node.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, NSF

GSR-1308 The JPSS Ground System Data Processing Node shall have an operational availability (Ao) of 99.9% measured over a 30-day period.

Rationale: This node is required continuously (i.e., 24/7) to support operations. Availability of the node encompasses availability of interfaces associated with this node.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1309 The JPSS Ground System Simulation Node shall have an operational availability (Ao) of 95% measured over a 30-day period.

Rationale: This node is utilized periodically during operations and is not required 24/7, therefore, the availability threshold has been reduced to 95% measured over a 30-day period. Availability of the node encompasses availability of interfaces associated with this node.

Mission Effectivity: JPSS-1, JPSS-2

GSR-1310 The JPSS Ground System Calibration/Validation Node shall have an operational availability (Ao) of 95% measured over a 30-day period.

Rationale: This node is utilized periodically during operations and is not required 24/7, therefore, the availability threshold has been reduced to 95% measured over a 30-day period. Availability of the node encompasses availability of interfaces associated with this node.

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

GSR-1311 The JPSS Ground System Field Terminal Support Node shall have an operational availability (Ao) of 95% measured over a 30-day period.

Rationale: The Field Terminal Support Node provides User Support, Software and Algorithm Support, and Direct Broadcast Quality Monitoring. Key to the support provided is a Web Portal which is where all data and products such as Software and Algorithm updates, Broadcast Data Quality Monitoring Reports, Mission Notices, Mission Schedules, etc., are placed for the Field Terminal Users to retrieve. Since those users can be scattered around the world, the Web Portal must be available 24.x7. Ao only applies to the Web Portal function.

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

GSR-1238 The JPSS Ground System shall incorporate 99.9% of the RDRs meeting processing thresholds in the production of SDRs, TDRs, and EDRs at the NESDIS Data Processing Node measured over a 30-day period.

Rationale: The JPSS Ground System must ensure the completeness of the data products that are produced and subsequently archived. Does not include RDRs that are under the data processing thresholds (due to fill data, etc.) and are not used for downstream processing.

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

GSR-1239 The JPSS Ground System shall generate RDRs from all non-fill Application Packets.

Rationale: The JPSS Ground System must ensure that all non-fill APs are processed to RDRs and provided to CLASS for archival storage.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1697 For GCOM-W1, the JPSS Ground System shall provide at least 99.9% of all deliverable products based on the SMD captured at the ground RF receiving point to ESPC measured over a 30-day period.

Rationale: Product Data Availability (APD) is defined as the number of data products provided to ESPC versus the number of expected products minus exceptions. The expected products include granule-based RDRs that should be generated from the APs received at the ground RF receiving point for the RDR production, deliverable ancillary and auxiliary data. The exceptions include products not requested by ESPC or not provided due to interface outages for which ESPC is responsible.

Mission Effectivity: GCOM-W1

GSR-1421 The JPSS Ground System shall make S-NPP EDRs available at the JPSS GS interface for each official external mission data consumer within 140 minutes of the observation time for at least 95% of the EDRs generated over a 30-day period.

Rationale: The JPSS Common Ground System shall measure end-to-end data latency as the time between the sensor observation and the time the EDR is available at the JPSS CGS interface for the official external mission data consumer. End-to-end data latency will include the lag between the sensor observation and the satellite downlink plus associated subscription delay. EDR latency exceptions include: Net Heat Flux (VIIRS-NHF-EDR), Sea Ice Characterization (VIIRS-SIC-EDR), and Surface Albedo (VIIRS-SA-EDR). Official external mission data consumers include NESDIS ESPC, CLASS, and SDS.

Mission Effectivity: S-NPP

GSR-3377 The JPSS Ground System shall produce S-NPP RDRs within 120 minutes of observation time of the latest sensor data used in the creation of an RDR for at least 95% of the RDRs generated over a 30-day period.

Rationale: Latency is measured from the observation time of the latest sensor data used in the creation of the RDR to the timestamp of the acknowledgement of successful delivery of the RDR to the user's landing zone. The 95% is an aggregate of all RDRs. Products are defined in GSRD Volume 2. The users for S-NPP RDRs include ESPC, CLASS, SDS, and GRAVITE.

The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay.

The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: S-NPP

GSR-3378 The JPSS Ground System shall produce SDRs using S-NPP data within 140 minutes of the observation time of the latest sensor data used in the creation of an SDR for at least 95% of the SDRs generated over a 30-day period.

Rationale: Not all users will get EDRs, therefore there is a need for latency for SDRs. Latency is measured from the observation time of the latest sensor data used in the creation of the SDR to the timestamp of the acknowledgement of successful delivery of the SDR to the user's landing zone. The 95% is an aggregate of all SDRs defined as the primary operational set of data products. Data products may contain data from S-NPP and other JPSS-managed satellites. In those cases, any product containing S-NPP data will comply with the S-NPP latency requirement. Products are defined in the GSRD Volume 2.

Mission Effectivity: S-NPP

GSR-3379 The JPSS Ground System shall produce TDRs using S-NPP data within 140 minutes of the observation time of the latest sensor data used in the creation of a TDR for at least 95% of the TDRs generated over a 30-day period.

Rationale: Not all users will get EDRs, therefore there is a need for latency for TDRs. Latency is measured from the observation time of the latest sensor data used in the creation of the TDR to the timestamp of the acknowledgement of successful delivery of the TDR to the user's landing zone. The 95% is an aggregate of all TDRs defined as the primary operational set of data products. Data products may contain data from both S-NPP and other JPSS-managed satellites. In those cases, any product containing S-NPP data will comply with the S-NPP latency requirement. Products are defined in the GSRD Volume 2.

Mission Effectivity: S-NPP

GSR-1562 The JPSS Ground System shall make GCOM-W1 RDRs available to the NESDIS ESPC in less than 12 minutes of the ground receiving time of the latest Application Packet in each RDR for at least 95% of the RDRs measured over a 30-day period.

Rationale: The ground data latency is measured from the time the JPSS GS receives the last packet in a RDR at the ground RF receiving point to the time that RDR is available to NESIDS ESPC. The latencies for the delivery requests that are aggregated are calculated from the last packet in the last RDR contained within the aggregated set. The latency does not include the associated subscription delay.

The percentage should be calculated as the number of products provided within the required time versus the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the NESDIS ESPC is responsible.

Mission Effectivity: GCOM-W1

GSR-3314 The JPSS Ground System shall make APs from GCOM-W1 available to the user's Point of Presence within 12 minutes of the ground receiving time for at least 95% of the APs intended for that user measured over a 30-day period.

Rationale: The ground data latency is measured from the time the JPSS CGS receives a packet at the ground RF receiving point to the time that packet is made available to the user. Assumes that AP deliveries are file-based and not filtered. Note that the user PoP is local at NSOF and CBU and JPSS does not provide the network. The GCOM-W1 AP users include FNMOC and NAVOCEANO.

The percentage should be calculated as the number of products provided within the required time versus the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired APs provided on late requests and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: GCOM-W1

GSR-3371 The JPSS Ground System shall produce SDRs within 80 minutes of the observation time of the latest sensor data used in the creation of an SDR for at least 95% of the SDRs generated over a 30-day period.

Rationale: Not all users will get EDRs, therefore there is a need for latency for SDRs. Latency is measured from the observation time of the latest sensor data used in the creation of the SDR to the timestamp of the acknowledgement of successful delivery of the SDR to the user's landing zone. The 95% is an aggregate of all SDRs defined as the primary operational set of data products. Products are defined in the GSRD Volume 2. The users for JPSS SDRs include ESPC, CLASS, SDS, and GRAVITE.

The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay.

The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: JPSS-1, JPSS-2

GSR-3372 The JPSS Ground System shall produce TDRs within 80 minutes of the observation time of the latest sensor data used in the creation of a TDR for at least 95% of the TDRs generated over a 30-day period.

Rationale: Not all users will get EDRs, therefore there is a need for latency for TDRs. Latency is measured from the observation time of the latest sensor data used in the creation of the TDR to the timestamp of the acknowledgement of successful delivery to the user's landing zone. The 95% is an aggregate of all TDRs defined as the primary operational set of data products. Products are defined in GSRD Volume 2. The users for JPSS TDRs include ESPC, CLASS, SDS, and GRAVITE.

The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay.

The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the user is responsible.

Mission Effectivity: JPSS-1, JPSS-2

GSR-3373 The JPSS Ground System shall produce JPSS RDRs within 70 minutes of observation time of the latest sensor data used in the creation of an RDR for at least 95% of the RDRs generated over a 30-day period.

Rationale: This requirement is derived as a sub-allocation of EDR latency. Latency is measured from the observation time of the latest sensor data used in the creation of the RDR to the timestamp of the acknowledgement of successful delivery of the RDR to the user's landing zone. The 95% is an aggregate of all RDRs.

Mission Effectivity: JPSS-1, JPSS-2

GSR-1663 The JPSS Ground System shall provide data communications service between the JPSS interface at the Svalbard Ground Station and the JPSS interface in the Continental U.S. (CONUS) that has an availability of no less than 99.95% averaged over a 30-day period.

Rationale: Establishes the uptime for data communication services.

Mission Effectivity: S-NPP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN

3.1.8 Ground System Capacity and Scalability

GSR-311 The JPSS Ground System shall include data processing capacity to process retransmitted data concurrently while processing current operational data.

Rationale: In the event of a communications outage, the Ground System must have margin to continue current operations while processing retransmitted data. Recovery processing of up to 24 hours of missed data must be completed within 5 days after retrieval.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-312 The JPSS Ground System shall include data communication capacity to retransmit data concurrently with transmission of current operational data.

Rationale: In the event of a communications outage, the Ground System must have communications channel capacity to continue current operations while retransmitting data delayed due to a communications outage. The time to retransmit data should not exceed the duration of the communications outage; i.e., if a ground station link is inoperative for 24 hours, any delayed data should be retransmitted within 24 hours while continuing normal operations.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-164 The JPSS Ground System shall include resources to perform maintenance without impact to operational services.

Rationale: The JPSS Ground System must include facilities for hardware and software maintenance, for use during nominal operations. This would allow configuration, analysis, testing and deployment of hardware and software, upgrades and new capabilities without impact to ongoing operations.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-168 The JPSS Ground System shall include resources to conduct training activities without impact to operational services.

Rationale: All ancillary operations of the JPSS Ground System must be conducted without impact to normal operations. Training includes operator training, user training and training for maintenance personnel.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-309 The JPSS Ground System shall have sufficient resources to perform commissioning of one JPSS-managed spacecraft while not impacting the simultaneous performance of ongoing operations.

Rationale: The JPSS Ground System must include resources, facilities, and capacity to complete on orbit checkout without impact to ongoing operations.

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

GSR-310 The JPSS Ground System shall have capacity to complete on-orbit calibration and validation of satellite following launch without impact to ongoing operations.

Rationale: Level-1 program requirements specify the time frame for calibration/validation hence the Ground System must include capacity to perform this function without impact to ongoing operations.

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

GSR-3211 The JPSS Ground System shall be scalable such that the services being provided can be extended to include up to seven JPSS-managed missions, five Data Processing Services missions and seven Data Acquisition and Routing missions.

Rationale: The JPSS Ground System needs to concurrently support existing operational missions while being scalable to support additional missions with different service needs.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-3229 The JPSS Ground System shall provide a minimum operational margin of 50% for the Data Processing Node throughout.

Rationale: Operational margin describes deployed capacity for limited growth during operations.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3230 The JPSS Ground System shall provide a minimum operational margin of 25% for the Space/Ground Communications Node, Management and Operations Node, and Data Processing Node storage.

Rationale: Operational margin describes deployed capacity for limited growth during operations.

Mission Effectivity: S-NPP, DMSP, GCOM-W1, JPSS-1, JPSS-2

GSR-3231 The JPSS Ground System shall provide a minimum operational margin of 20% for Management and Operations Node peak total CPU capacity.

Rationale: Operational margin describes deployed capacity for limited growth during operations.

Mission Effectivity: S-NPP, DMSP, GCOM-W1, JPSS-1, JPSS-2

GSR-3232 The JPSS Ground System shall provide a minimum operational margin of 20% for Management and Operations Node peak total memory capacity.

Rationale: Operational margin describes deployed capacity for limited growth during operations.

Mission Effectivity: S-NPP, DMSP, GCOM-W1, JPSS-1, JPSS-2

GSR-2309 The JPSS Ground System shall provide sufficient receptors at the McMurdo Ground Station (MGS) to support mission data acquisition for up to two DMSP satellites.

Rationale: DMSP ConOps [Draft v2]: "The automated JPSS Ground Receptors (T-Site & Fines Site) will be utilized to receive all DMSP mission data down-linked at McMurdo Station, Antarctica. The McMurdo Multi-Mission Communications System (MMCS) being developed by the JPSS contractor and DMSP mission unique equipment being developed by the DMSP contractor will allow the use of JPSS receptors and communications links to allow data flow to AFWA." and "The McMurdo station support is limited to two DMSP spacecraft. These two spacecraft will be the DMSP satellites that have been designated as the primary DMSP (also known as SPRINT birds)." While the service is provided to a maximum of two DMSP satellites, only one DMSP pass is supported at any given time.

Mission Effectivity: DMSP

3.1.9 Training Support

GSR-162 The JPSS Ground System shall provide a training environment that mimics the operational environment.

Rationale: The JPSS Ground System must include an environment for training operators which provide comprehensive operator training. Training must cover nominal and emergency situations including failover to backup systems. Training capabilities need to be capable of 'test-like-you-fly" fidelity, and represent real-life operational situations.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-200 The JPSS Ground System training environment shall be configurable without software releases or code changes (i.e., data driven).

Rationale: The training environment should be completely data/script driven, and only requiring a major upgrade with the addition of a new service, mission or major resource (new facility, etc.).

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.1.10 Maintenance

GSR-196 When transitioning JPSS Ground System resources to a new release for operations, the JPSS Ground System shall revert to the prior operational configuration within five minutes of being commanded in case of anomalies with the new capabilities.

Rationale: All transitions of operation from a current set of resources to a new set (e.g., new software, new hardware, new strings of equipment, additional resources to extend capacity, etc.) should be performed in a manner that allows for rapid fall back to the previous operational state in the event an anomaly with the new resources is encountered.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-3375 The JPSS Ground System shall transition operations between the primary operating environment and the secondary operating environment within five minutes of initiation.

Rationale: This will limit the time the JPSS Ground System will be in a transient state and minimize impacts to the operational robustness, availability, fault tolerance or performance of the JPSS Ground System. Either the primary or secondary system environment may be designated as the operational system for a period of time. This requirement can apply to the MON only, the DPN only, or both the MON and DPN.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-1712 The JPSS Ground System shall provide a library of configuration-managed artifacts for the operational JPSS System.

Rationale: The configuration-managed artifacts include documentation, baseline algorithm code, processing coefficient tables, and look-up tables.

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

3.2 JPSS Ground System Interfaces

3.2.1 Interfaces

GSR-3564 The JPSS Ground System shall comply with the Joint Polar Satellite System (JPSS) Government Resource for Algorithm Verification, Integration, Test and Evaluation (GRAVITE) to STAR Central Data Repository (SCDR) Interface Requirement Document (IRD) (474-00990).

Rationale: GRAVITE must interface to the STAR system for the exchange of data.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3214 The JPSS Ground System shall interface with the Attitude Ground System in accordance with the JPSS CGS to AGS IRD (474-00316).

Rationale: Defines the Interface requirements supporting the ground based assessment of satellite attitude and derivation of attitude sensor coefficients.

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

GSR-2 The JPSS Ground System shall interface with the NESDIS ESPC in accordance with the JPSS GS to NESDIS ESPC IRD (474-00303).

Rationale: The NESDIS ESPC is a primary customer for JPSS Ground System generated observational products and associated by-products (e.g., metadata, intermediary products, mission alerts, etc.). NESDIS is responsible for the collection, archiving, and dissemination of the environmental data collected by a variety of in situ and remote sensing observing systems operated by NOAA.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-2326 The JPSS Ground System shall interface with SCaN-managed missions in accordance with the JPSS GS to NASA SCaN IRD (474-00307).

Rationale: The JPSS Ground System must interface with SCaN-managed missions.

Mission Effectivity: SCaN

GSR-3 The JPSS Ground System shall interface with CLASS in accordance with the JPSS GS to CLASS IRD (474-00302).

Rationale: JPSS observational data, products, by-products, installed code and configuration data are to be sent to CLASS (as opposed to developing a separate repository) for archival storage. The CLASS is NOAA's enterprise-wide information technology system designed to support long-term, secure preservation and standards-based access to environmental data collections and information.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-10 The JPSS Ground System shall interface with the NASA SDS in accordance with the JPSS GS to NASA SDS IRD (474-00304).

Rationale: The SDS provides the capabilities to assess and verify the climate quality of observational products. The SDS receives data from several external systems including JPSS CGS, NOAA's Comprehensive Large Array-data Stewardship System (CLASS), and Casa NOAA Observing System Architecture (CasaNOSA), in order to evaluate data with respect to climate research.

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

GSR-203 The JPSS Ground System shall interface with the Naval Oceanographic Office in accordance with the JPSS GS to NAVOCEANO IRD (474-00315).

Rationale: Naval Oceanographic Office (NAVOCEANO) acquires and analyzes global ocean and littoral data to provide specialized, operationally significant products and services for war fighters and civilian, national and international customers. These products and services support virtually every type of Fleet operation by providing mission essential information to the war fighter 24 hours a day, seven days a week.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-204 The JPSS Ground System shall interface with the Fleet Numerical Meteorology and Oceanography Center (FNMOC) as defined in the JPSS GS to FNMOC IRD (474-00314).

Rationale: Fleet Numerical Meteorology and Oceanography Center (FNMOC) is the Department of Defense's (DoD) primary central production site for worldwide computer-generated operational meteorological and oceanographic analysis and forecast products. Fleet Numerical Meteorology and Oceanography Center (FNMOC) is one of a half dozen internationally recognized operational weather centers and the world's leader in global oceanographic and coupled air-ocean forecasting.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-221 The JPSS Ground System shall interface with the NOAA/NESDIS FCDAS for JPSS-managed satellites in accordance with the JPSS GS to NESDIS FCDAS IRD (474-00305).

Rationale: FCDAS is the backup Ground Station for the S-NPP TT&C and SMD RF link services. JPSS must maintain interfaces to the S-NPP satellite until S-NPP is decommissioned.

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

GSR-224 The JPSS Ground System shall interface with the DMSP in accordance with the JPSS GS to DMSP IRD (474-00308).

Rationale: The JPSS Ground System is providing dual S-band terminal at McMurdo to support DMSP data acquisition and routing in accordance with ConOps for DMSP Operations Annex-N.

Mission Effectivity: DMSP

GSR-225 The JPSS Ground System shall interface with the MetOp Mission in accordance with the JPSS GS to EUMETSAT IRD (474-00309), the Meteorological Operational Satellite (MetOp) Network Requirements Document (NRD) (474-REF-00401), and the EUMETSAT EPS-NOAA ADA Operations ICD (474-REF-00663).

Rationale: The JPSS Ground System is providing routing services for Metop SMD data acquired at McMurdo Ground Station (MGS) in accordance with Memorandum of Agreement between NOAA and EUMETSAT for Joint Transition Activities (JTA).

Mission Effectivity: Metop

GSR-228 The JPSS Ground System shall interface with the Coriolis/WindSat Mission in accordance with the JPSS GS to Coriolis/WindSat IRD (474-00313).

Rationale: The JPSS Ground System shall be capable of receiving mission data for Coriolis at the Svalbard Ground Station. The JPSS Ground System is providing data acquisition and routing services at Svalbard ground system for Coriolis data.

Mission Effectivity: Coriolis/WindSat

GSR-2322 The JPSS Ground System shall comply with the JPSS CGS to FVTS IRD (474-00222).

Rationale: The JPSS Ground System must have a simulation node. The CGS must interface to the Simulation node.

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

GSR-2323 The JPSS Ground System shall comply with the JPSS CGS to GRAVITE IRD (474-00200).

Rationale: The CGS must interface to the Cal/VAL node for calibration, validation and algorithms.

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

3.2.2 RF Link Interfaces

GSR-208 The JPSS Ground System shall interface with the S-NPP Satellite TT&C S-band RF links in accordance with the S-NPP Spacecraft S-Band Radio Frequency

Interface Control Document (ICD) to the Norway Ground Station (429-03-02-25).

Rationale: This document specifies the TT&C interface between the space segment and the Ground System for S-NPP.

Mission Effectivity: S-NPP

GSR-1559 The JPSS Ground System shall interface with the JPSS Satellite TT&C S-band RF links in accordance with the IRD for RF Interfaces To and From JPSS Satellites (472-00173).

Rationale: This document specifies the TT&C interface between the space segment and the Ground System for JPSS.

Mission Effectivity: JPSS-1

GSR-3264 The JPSS Ground System shall interface with the JPSS Satellite Stored Mission Data (SMD) Ka-band RF link in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).

Rationale: This document specifies the SMD interface between the space segment and the Ground System for JPSS.

Mission Effectivity: JPSS-1

GSR-209 The JPSS Ground System shall interface with the S-NPP Satellite TT&C S-band RF links in accordance with the NPP S-Band Data Format ICD (429-04-02-27).

Rationale: This document specifies the TT&C interface between the space segment and the Ground System for S-NPP.

Mission Effectivity: S-NPP

GSR-210 The JPSS Ground System shall interface with the S-NPP Stored Mission Data (SMD) RF link in accordance with the NPP Spacecraft SMD ICD to the Norway Ground Station (429-03-02-26).

Rationale: JPSS must maintain interfaces to the S-NPP satellite until S-NPP is decommissioned.

Mission Effectivity: S-NPP

GSR-211 The JPSS Ground System shall interface with the S-NPP High Rate Data (HRD) RF link in accordance with the NPP Spacecraft High Rate Data RF ICD to the Direct-Broadcast Stations (429-03-02-24).

Rationale: JPSS must maintain interfaces to the S-NPP satellite until S-NPP is decommissioned.

Mission Effectivity: S-NPP

GSR-212 The JPSS Ground System shall interface with the S-NPP Stored Mission Data (SMD) and High Rate Data (HRD) RF links in accordance with the NPP X-Band Data Format Interface Control Document (ICD) (429-04-02-28).

Rationale: JPSS must maintain interfaces to the S-NPP satellite until S-NPP is decommissioned.

Mission Effectivity: S-NPP

GSR-233 The JPSS Ground System shall interface with White Sands in accordance with the Network Requirements Document for JPSS-1 (474-REF-00803) and the SN to JPSS C3S ICD (474-REF-00651).

Rationale: The Space Network provides full orbit coverage to JPSS-1 and will be relied upon during the initial phases of launch and orbital insertion. The SN will also provide back-up TT&C capabilities for mission critical events (e.g., on-orbit activation, orbit maintenance maneuvers) and contingency events (e.g., lost connections to ground stations). SN will also provide a backup SMD capability for JPSS-1.

Mission Effectivity: JPSS-1

3.2.3 Space to Ground Communication Services

GSR-220 The JPSS Ground System shall interface with Kongsberg Satellite Services (KSAT) for TT&C and SMD in accordance with the JPSS GS to KSAT IRD (474-00109).

Rationale: This IRD will include all support from KSAT to JPSS Ground Project. Svalbard will be a primary Ground Station site for the TT&C and SMD. GCOM-W1 support is limited to SMD support only.

Mission Effectivity: S-NPP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-226 The JPSS Ground System shall interface with the McMurdo NSF in accordance with the JPSS GS to NSF IRD (474-00311).

Rationale: The JPSS Ground System is providing data acquisition and routing services at McMurdo NSF facilities.

Mission Effectivity: NSF

3.2.4 Operations Support Interfaces

GSR-232 The JPSS Ground System shall interface to the NASA Space Network for S-band TT&C services as defined in the Joint Polar Satellite System (JPSS) Command, Control, and Communications Segment (C3S) Interface Control Document (ICD) (474-REF-00651).

Rationale: JPSS must maintain interfaces to the S-NPP satellite until S-NPP is decommissioned. The Space Network provides full orbit coverage to S-NPP. The SBN will provide back-up TT&C capabilities for mission critical events (e.g., orbit maintenance maneuvers) and contingency events (e.g., lost connections to ground stations).

Mission Effectivity: S-NPP

GSR-234 The JPSS Ground System shall interface to the NASA Flight Dynamics Facility as defined in the NRD for JPSS-1 (450-NRD-JPSS1).

Rationale: The Flight Dynamics Facility provides definitive post-maneuver orbital data.

Mission Effectivity: JPSS-1

GSR-238 The JPSS Ground System shall interface with the JPSS Flight Project spacecraft and instrument support nodes for full life cycle support in accordance with the JPSS Ground Project to Flight Project IRD (474-00223).

Rationale: The JPSS Ground System requires sustainment support for the Instrument and Spacecraft Support Nodes.

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

GSR-1220 The JPSS Ground System shall interface with NASA's Conjunction Assessment Risk Analysis (CARA) for conjunction assessment services directly in accordance with the JPSS GS CA IRD (474-00300).

Rationale: JPSS must maintain interfaces to the S-NPP and JPSS satellites. NASA's CARA provides conjunction analysis and collision avoidance maneuver verification support to JPSS operations. These interfaces are critical to maintaining safe operations of JPSS/NOAA-managed space assets.

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

3.2.5 Launch Support Segment Interfaces

GSR-250 The JPSS Ground System shall interface to the JPSS-1 Launch Facility in accordance with the JPSS-1 Launch Site Support Plan (LSP-PLN-333.01-JPSS-1-LSSP).

Rationale: The JPSS-1 mission requires the capability for satellite testing while at the launch site, as well as final ground/flight configuration synchronization prior to the launch of JPSS-1.

Mission Effectivity: JPSS-1

GSR-3315 The JPSS Ground System shall interface to the JPSS-2 Launch Facility in accordance with the JPSS-2 Launch Site Support Plan (TBR).

Rationale: The JPSS-2 mission requires the capability for satellite testing while at the launch site, as well as final ground/flight configuration synchronization prior to the launch of JPSS-2.

Mission Effectivity: JPSS-2

3.2.6 Facility Interfaces

GSR-822 The JPSS Ground System shall interface with the NOAA NSOF facility in accordance with the JPSS GS to NSOF Facilities IRD (474-00306).

Rationale: Facility level requirements to support JPSS systems at the NSOF will be captured in a stand-alone IRD/ICD suite of documents. Mission Effectivity applies to the missions supported from the facility, not data routing.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-823 The JPSS Ground System shall interface with the NESDIS CBU facility in accordance with the JPSS GS to NESDIS CBU Facilities IRD (474-00310).

Rationale: Facility level requirements to support JPSS systems at the NSOF COOP Facility will be captured in a stand-alone IRD/ICD suite of documents. Mission Effectivity applies to the missions supported from the facility, not data routing

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.3 Space/Ground Communications Node

3.3.1 Uplink Processing

GSR-1177 The JPSS Ground System shall uplink data to JPSS-managed satellites.

Rationale: The ground system must be capable of transmitting commands, table updates, and flight software loads to S-NPP, JPSS-1, and JPSS-2.

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

GSR-1182 The JPSS Ground System shall store uplink data at KSAT transmitting ground stations in accordance with the implementing agreement between NOAA and NSC on Cooperation (11/28/08 & 4/2/02).

Rationale: This is to cover the unique requirement for the Svalbard site and is not applicable for any other ground station. The data that will be stored includes uplink and antenna tracking data.

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

3.3.2 Downlink Processing

GSR-1178 The JPSS Ground System shall provide telemetry downlink processing.

Rationale: The ground system must be capable of receiving telemetry from the spacecraft at the ground stations storing it at the receive location (per GSR-100), and delivering it for processing. The referenced documents provide information about the telemetry data structure and content and the radio frequency of the downlink.

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

GSR-1179 The JPSS Ground System shall acquire downlinks to receive telemetry from JPSS missions.

Rationale: The Ground System is responsible for establishing the communications link between the satellite and ground. That link is the mechanism for receiving telemetry data.

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

GSR-100 The JPSS Ground System shall retain all received satellite downlink data at the receiving ground station for a minimum of seven days.

Rationale: The JPSS Ground System must retain data at ground stations for a sufficient period to allow recovery from communications network outages.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1183 The JPSS Ground System shall acquire SMD from the JPSS-managed satellites.

Rationale: The JPSS Ground System must perform SMD acquisition for JPSS-managed satellites.

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

GSR-3233 The JPSS Ground System shall acquire HRD from the JPSS satellite in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).

Rationale: The JPSS Ground System performs HRD acquisition for JPSS satellites via the X-band link. The IRD provides the necessary information for usage of that link.

Mission Effectivity: JPSS-1

3.3.3 Manage Ground Station

GSR-253 The JPSS Ground System shall be capable of supporting operations over the TT&C S-Band forward and return links, while acquiring SMD return links and monitoring direct broadcast links simultaneously for any JPSS-managed satellite.

Rationale: All TT&C operations, SMD acquisition and direct broadcast monitoring must be performed in parallel given the limited pass time for any given ground site.

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

GSR-481 The JPSS Ground System shall manage all Space/Ground Communication Node resources.

Rationale: The JPSS Ground System links and their associated equipment must be available when required to communicate with the satellites. Ensuring that availability is the responsibility of the Ground System.

Mission Effectivity: S-NPP, DMSP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

3.4 Ground Network Node

3.4.1 Manage Ground Networks

GSR-622 The JPSS Ground System shall manage all Ground Network Node resources.

Rationale: The JPSS Ground Networks typically operate in a long term configuration. However, the Ground Networks will require updating, enhancement, expansion and reconfiguring over the life of the Ground System. This function provides those capabilities across the Ground Network Node. This function would also provide the capability to allocate bandwidth for data transferred between Svalbard and CONUS among missions.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.4.2 Provide Distributed Communication Services

GSR-337 The JPSS Ground System shall provide network communications between the internal elements of the ground system.

Rationale: The JPSS Ground System includes ground stations, data processing sites, mission management sites, and connectivity to archiving, flight dynamics, launch facilities, spacecraft

and instrument developers, the ground system developer and other sites. The JPSS Ground System must provide WAN connectivity between the sites internal to the JPSS ground system.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-492 The JPSS Ground System shall provide voice communications circuits among JPSS facilities.

Rationale: The JPSS Ground System includes ground stations, data processing sites, mission management sites, and connectivity to archiving, flight dynamics, launch facilities, spacecraft and instrument developers, the ground system developer and other sites. The JPSS Ground System must provide WAN connectivity between the sites internal to the JPSS ground system.

Mission Effectivity: JPSS-1, JPSS-2

GSR-2318 The JPSS Ground System shall make any MSD (e.g., satellite ephemeris, ancillary data) needed to produce xDRs available to the user community.

Rationale: Field Terminal Users require MSD in order to produce data products.

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

GSR-338 The JPSS Ground System shall provide network communications to external elements for the exchange of mission data.

Rationale: The JPSS Ground System includes ground stations, data processing sites, mission management sites, and connectivity to archiving, flight dynamics, launch facilities, spacecraft and instrument developers, the ground system developer and other sites. The JPSS Ground System must provide WAN connectivity between the sites external to the JPSS ground system in accordance with ICDs which state the agreed demarcation points and data formats.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-284 The JPSS Ground System shall utilize Wide Area Network (WAN) services that only employ lossless compression techniques when compression is needed.

Rationale: The ground system must not employ data compression or other techniques which reduce the resolution of data as provided by spacecraft. This applies to data processing as well as data communications.

Mission Effectivity: S-NPP, DMSP, GCOM-W1, JPSS-1, JPSS-2

GSR-1666 The JPSS Ground System shall collect DMSP data at McMurdo and relay to the DMSP Service Delivery Point.

Rationale: The JPSS Ground system must acquire DMSP data and route it to its destination.

Mission Effectivity: DMSP

GSR-1668 The JPSS Ground System shall provide Data Routing services.

Rationale: A high availability WAN will allow critical mission data (e.g., SMD) to flow from the acquisition GSNs to the DPNs at a rate sufficient to meet JPSS product latency and data

availability requirements. This requirement does not preclude the use of optimizing proxy protocols over segments of the network that experience high latency and/or high packet loss that degrade the performance of TCP/IP. The use of optimizing protocols should be transparent to the end systems (applications) implementing TCP/IP based interfaces. Third party applications may be implemented to achieve efficient transfer of large data volumes over high bandwidth WAN links if normal protocols do not support the parameters of delivery (high efficiency and guaranteed delivery) over low latency/low loss links. A highly efficient wide area network provides the cost benefit of not having to procure extra bandwidth to accommodate degraded throughput to meet system latency and capacity requirements.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-2331 The JPSS Ground System shall make GCOM-W1 mission data available to JAXA.

Rationale: The JPSS Ground Project is responsible to make available GCOM W-1 mission data to JAXA. This is accomplished via SFTP (or the like) from JAXA over the open internet per JPSS Ground Project SOW for NSC contract for GCOM-1 Support Services.

Mission Effectivity: GCOM-W1

GSR-3316 The JPSS Ground System shall make 99% of GCOM-W1 mission support data available to JAXA, measured monthly.

Rationale: The JPSS Ground Project is responsible to make available GCOM W-1 mission support data to JAXA. This is accomplished via SFTP (or the like) from JAXA over the open internet per JPSS Ground Project SOW for NSC contract for GCOM-1 Support Services. For example: Post-Pass Reports, Schedule & Coordination …"

Reference: GCOM-W1 Mission Operations Interface Specification (MOIS) Rev. 10 (474-REF-00145).

Mission Effectivity: GCOM-W1

GSR-3208 The JPSS Ground System shall store Mission Support Data (MSD) files for a minimum of seven days at the Data Processing Nodes.

Rationale: The MSD files must be stored to support MSD processing and product generation timelines.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3261 The JPSS Ground System shall provide Network Communication Services that meet a minimum throughput efficiency of 90%.

Rationale: The flow of mission data throughput must be at a rate sufficient to meet JPSS product latency and data availability requirements.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

3.4.3 Reliable SMD Transfer

GSR-3282 The JPSS Ground System shall perform multimission SMD CCSDS SLE and CCSDS AOS processing (VCDU with header extensions and APID extraction) on SMD acquired by the JPSS Space Ground Communications Node at a central location.

Rationale: For reliable SMD transfer, a centralized location allows for universal data accounting of received data as well as supporting cost-effective connection-oriented data transfers. The centralized location will also have a backup for COOP purposes. The planned centralized locations are the NSOF and CBU locations.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3317 The JPSS Ground System shall remove duplicative data from the SMD acquired at the SMD Hub location.

Rationale: The SMD Hub tracks the completeness of data and can identify and remove duplicate data.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3283 The JPSS Ground System shall extract application packet identifiers (APIDs) from VCDUs in accordance with the CCSDS AOS Spec.

Rationale: The SMD Hub identifies the APIDs and Virtual Channels associated with each satellite.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3364 The JPSS Ground System at the Space/Ground Communications Node shall annotate all Virtual Channel Data Units (VCDUs) with ground receipt information.

Rationale: SMD will utilize CCSDS SLE services for transmission to the JPSS SMD Hub (JSH).

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3286 The JPSS Ground System shall forward configurable sets of SMD application packets to configured destinations.

Rationale: The SMD Hub is configurable as to which APIDs are sent to which destination. Furthermore, configurable destinations include the DPN, alternate DPN, FNMOC, NAVOCEANO, MON Payload Store (replacement for PST).

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1674 The JPSS Ground System shall store non-duplicate SMD from JPSS-managed satellites for at least seven days.

Rationale: SMD includes science APs, S-TLM and any unidentified APs from the spacecraft. This store allows for the retransmission of received data without burdening the JPSS network with having to pull data from the remote ground stations.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3319 Upon request from authorized Hub users, the JPSS Ground System shall retransmit stored SMD.

Rationale: The SMD Hub can retransmit received data to resolve back-end communications issues with its configurable destinations.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3320 The JPSS Ground System SMD Hub shall notify operations regarding missing data from JPSS-managed satellites.

Rationale: The SMD Hub is responsible for tracking the completeness of data received at the various JPSS ground stations. This notification allows for the scheduling of retransmissions from the appropriate satellite.

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

3.5 Management & Operations Node

3.5.1 Flight Operations

GSR-404 The JPSS Ground System shall allow only a single command source at any given time for any JPSS-managed satellite.

Rationale: Commanding of JPSS-managed satellites must be constrained to a single command source within the JPSS Management & Operations node. In combination with operational availability, this requirement implies the ability to hand over the command source role quickly in event of anomalies with the HW or SW at the command source.

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

GSR-394 The JPSS Ground System shall ensure operations have complete and timely situational awareness of all JPSS Flight System resources.

Rationale: Situational Awareness includes state of health, performance statistics, capacities, margins, security status etc., of JPSS HW and SW. It is collected and logged at each JPSS resource location, with summary reporting, heart-beat and AWE reporting back to operations on a selectable cycles and conditions.

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

GSR-89 The JPSS Ground System shall perform command and control of JPSS-managed satellites.

Rationale: The primary function of the JPSS Ground System is to provide flight operations capabilities for managing JPSS-managed flight resources.

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

GSR-154 The JPSS Ground System shall validate all flight system commands, table loads and flight software prior to upload to the satellites.

Rationale: When uploads are to be made to JPSS-managed satellites, the system must assess upload constraints against the current state of the system to ensure proper and successful execution of the upload. Validation is focused on format, range, data typing, structure, and a pre-defined subset of preconditions.

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

GSR-91 The JPSS Ground System shall manage the on-orbit configuration of all JPSS-managed satellites.

Rationale: The JPSS Ground System must maintain the on-orbit configuration of satellite hardware, software and tables. It also must be able to update the on-board configuration to ensure JPSS-managed satellites continue to meet their Ao requirements.

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

GSR-90 The JPSS Ground System shall assess all flight activities for JPSS-managed satellites.

Rationale: JPSS Ground system must assess and report all on-orbit operations. This includes assessment against planned activities.

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

GSR-259 The JPSS Ground System shall configure the content of the TT&C downlinks for JPSS-managed satellites.

Rationale: The content of the TT&C downlink (real-time and stored) is managed by the JPSS Ground System in order to adjust satellite state of health reporting as needed.

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

GSR-260 The JPSS Ground System shall configure the content of the direct broadcast downlinks for JPSS-managed satellites.

Rationale: The JPSS Ground System must configure, monitor and manage the direct broadcast links to ensure proper operation.

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

GSR-261 The JPSS Ground System shall configure the content of the SMD downlinks for JPSS-managed satellites.

Rationale: The content of the SMD downlink is managed by the JPSS Ground System in order to adjust satellite state of health reporting as needed.

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

GSR-262 The JPSS Ground System shall maintain operational and residual satellites relative phasing.

Rationale: Ground contact conflicts can impact sensor data acquisition, thus impacting latency and completeness. Planning and scheduling needs to ensure optimal use of ground station assets.

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

GSR-256 The JPSS Ground System shall manage all ground and flight system calibration products in order to meet data product quality requirements, as specified in the GSRD Volume 2.

Rationale: Up to date Flight System calibration data is required in order to achieve the required weather product quality and precision. Management includes monitoring, verifying, updating and distributing the calibration data as needed to meet L1 performance metrics.

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

GSR-92 The JPSS Ground System shall manage the operational databases.

Rationale: Each of these databases is the definitive source of definitions for the functions it supports. They are developed and maintained from mission-specific source documents. The databases include command and telemetry; memory structure/table formats; and data product generation.

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

GSR-159 The JPSS Ground System shall utilize NASA's Space Network to provide concurrent full-orbit TT&C coverage for critical operations.

Rationale: The NASA Space Network provides full orbit communications in order to support mission critical operations which fall outside or extend beyond the periods of ground station contacts. All mission critical activities (e.g., launch, on-orbit checkout, orbit maintenance maneuvers) require real-time communications coverage to reduce risk to the overall mission. Concurrent coverage implies the JPSS Ground Station can be communicating with a JPSS-managed satellite via SN and a Ground Station simultaneously, with only one path acting as the active command link.

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

GSR-153 The JPSS Ground System shall manage end-of-life satellite disposal in accordance with the NASA Procedural Requirements for Limiting Orbital Debris, (NPR 8715.6A) and the Process for Limiting Orbital Debris (NASA-STD-8719.14).

Rationale: Spacecraft must not be allowed to deorbit in an uncontrolled manner to prevent the possibility of personal injury, property damage or damage to other spacecraft.

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

GSR-3234 The JPSS Ground System shall process S-band telemetry from JPSS-managed satellites.

Rationale: Telemetry information must be made available in near real-time after receipt to ensure that the latest information about spacecraft and sensor performance and state of health are known. Processing includes the ingest.

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

GSR-3356 The JPSS Ground System shall process S-NPP X-band telemetry.

Rationale: Telemetry information must be made available in near real-time after receipt to ensure that the latest information about spacecraft and sensor performance and state of health are known. Processing includes the ingest.

Mission Effectivity: S-NPP

GSR-3357 The JPSS Ground System shall perform Ka-band AOS CCSDS preprocessing for the JPSS missions in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173) at each JPSS Ground Station.

Rationale: Telemetry information must be made available in near real-time after receipt to ensure that the latest information about spacecraft and sensor performance and state of health are known. Processing includes the ingest.

Mission Effectivity: JPSS-1, JPSS-2

GSR-3366 The JPSS Ground System shall acquire Telemetry at the JPSS CGS Ground Stations to enable extraction of the bit stream in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).

Rationale: Ground Station performs tracking, down conversion to IF, demodulation and decoding of the CCSDS Telemetry Channel Coding applied by the satellite prior to baseband preprocessing function.

Mission Effectivity: JPSS-1, JPSS-2

3.5.2 Orbit/Attitude Management

GSR-146 The JPSS Ground System shall predict orbital events for all JPSS-managed satellites.

Rationale: Prediction of orbital events such as occultation, terminator crossings, and geometric events is necessary for spacecraft management. Spacecraft management also includes planning maneuvers to avoid orbital debris that pose a credible threat to mission success.

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

GSR-140 The JPSS Ground System shall perform orbit determination for all JPSS-managed satellites.

Rationale: The ground system will capable of performing orbit determination solutions independent of the flight system. Orbit and attitude knowledge is integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing orbit determination.

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

GSR-142 The JPSS Ground System shall verify the spacecraft on-board attitude determination solution for JPSS-managed satellites.

Rationale: Spacecraft use attitude data for antenna pointing, thermal management, and other uses. Orbit and attitude knowledge is also integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing attitude determination.

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

GSR-34 The JPSS Ground System shall maintain the JPSS-managed satellites in the designated orbits as specified in the JPSS Program Level 1 Requirements Document (JPSS-REQ-1001).

Rationale: In order to operate the S-NPP and JPSS satellites in their proper orbits, the JPSS Ground System must perform orbital maintenance. S-NPP requirement is derived from the JPSS requirement, as it is not included in the L1RD.

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

GSR-152 The JPSS Ground System shall generate spacecraft maneuver commands for all mission phases.

Rationale: The JPSS Ground System must perform all calculations and generate commands to adjust orbits and perform attitude maneuvers of JPSS-managed satellites. Orbits are adjusted to maintain design orbits, perform collision avoidance maneuvers, execute end-of-life disposal and perform calibration maneuvers.

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

GSR-155 The JPSS Ground System shall utilize NASA CARA for collision avoidance alerts, planning and execution.

Rationale: Collision avoidance planning is necessary to minimize the risk of JPSS-managed spacecraft damage or damage to other spacecraft. GSFC-managed missions are required to have this capability, as per GPD 7120.1A, "GSFC Space Asset Protection Policy and the Process for Limiting Orbital Debris (NASA-STD-8719.14)".

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

GSR-3402 The JPSS Ground System shall provide a time-tagged orbital position estimate accurate to 75/75/75 meters, 3 sigma for radial/in-track/cross-track components.

Rationale: The ground system will be capable of generating orbit determination solutions independent of the flight system. Orbit and attitude knowledge is integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing orbit determination.

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

GSR-3403 The JPSS Ground System shall provide a time-tagged attitude estimate accurate to 90 arcsec, 3 sigma per axis.

Rationale: The ground system will be capable of performing ground-based attitude determination independent of the flight system. Orbit and attitude knowledge is integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing attitude determination.

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

3.5.3 Analysis and Trending

GSR-268 The JPSS Ground System shall provide the capability to perform trending on all aspects of JPSS-managed satellites.

Rationale: Long term trending includes processing all stored health and safety telemetry from the spacecraft and sensors.

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

GSR-114 The JPSS Ground System shall perform trending on the Ground System Status.

Rationale: Trending and analysis of system performance relies on a comprehensive archive of data and events. System model development to support system evolution can be validated against this archive. All status data reported by components in the JPSS, both fleet and ground, are monitored and logged with time tags to be accessible for analysis subsequent to the time it was logged. Status includes state of health and state of service.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-119 The JPSS Ground System shall allow operators to retrieve archived data based on user-defined search parameters.

Rationale: Operators are required to retrieve data based on various parameter searches for real-time and long-term analysis.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-121 The JPSS Ground System shall provide analysis functions and tools for trend analysis over any user-defined time period from one orbit to one year.

Rationale: Operators must have the ability to examine trends over a wide variety of time periods to assess the health of the system and aid in fault diagnosis. This should be done using a set of analysis and engineering tools which reduces the need to develop custom tools for operators.

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

3.5.4 Ground Operations

GSR-1700 The JPSS Ground System shall control ground system resources to ensure their availability when required for JPSS-managed and supported missions.

Rationale: Control of ground system resources involves monitoring and changing configurations as required by the various JPSS-supported missions. It also involves scheduling downtime for maintenance and equipment change outs so as not to adversely impact support to the missions.

Mission Effectivity: S-NPP, DMSP, GCOM-W1, JPSS-1, JPSS-2

GSR-393 The JPSS Ground System shall ensure operations have complete and timely situational awareness of all JPSS Ground System resources.

Rationale: Situational Awareness includes state of health, performance statistics, capacities, margins, security stats etc., of JPSS HW and SW. It is collected and logged at each JPSS resource location, with summary.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-1699 The JPSS Ground System shall validate ground commands prior to their execution.

Rationale: The JPSS Ground System must validate ground control commands against pre-defined command limits prior to executing the implementation plan.

Mission Effectivity: S-NPP, DMSP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-134 The JPSS Ground System shall display system status to operators in near real-time.

Rationale: It is essential to provide situational awareness to operators on a real-time or near real-time basis.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-303 The JPSS Ground System shall generate data metrics for all data processed.

Rationale: The Ground System must provide real-time monitoring of the data processing for the support of missions.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-304 The JPSS Ground System shall generate data accounting metrics for all received data.

Rationale: The Ground System must provide real-time monitoring of the accounting of data within the ground system.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-305 The JPSS Ground System shall generate data accounting metrics for all delivered data.

Rationale: To ensure accurate delivery of data, the Ground System must continuously monitor the delivery of data so it can be corrected in case of data loss or errors. GCOM-W1 effectivity is limited to RDR product generated.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1731 The JPSS Ground System shall be capable of transmitting data via the SN/WSC to the JPSS satellites.

Rationale: The JPSS Ground System utilizes SCaN, SN, services for S-Band command of JPSS-managed missions.

CGS is responsible for getting command data at WSC. SCaN is responsible for uplink of command via TDRSS to JPSS-managed satellites.

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

GSR-3265 The JPSS Ground System shall be capable of receiving data from the JPSS satellites via SN/WSC.

Rationale: The JPSS Ground System utilizes SCaN, SN, services for S-Band and Ka-Band return link data for JPSS-managed satellites.

CGS is responsible for getting data from WSC. SCaN is responsible for return link data via JPSS-managed satellites via TDRSS.

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

GSR-306 The JPSS Ground System shall monitor communications network operation.

Rationale: The JPSS Ground System must maintain awareness of the availability of primary and backup communications channels to ensure communications reliability. Includes whether network is up or down and heavily it is being utilized or planned to be utilized.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-133 The JPSS Ground System shall monitor services provided by external entities.

Rationale: The primary function of the control center is to monitor and control JPSS resources and activities. Insight must be provided into services provided by external entities such as the NASA Space Network, Ground Network, commercial ground stations, WAN providers, and other entities outside the actual JPSS Ground System.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-73 The JPSS Ground System shall manage Mission Support Data.

Rationale: Mission Support Data is utilized across the JPSS Ground System and by external users and has to be collected, maintained, kept current, and distributed to various functions and operational processes.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-139 The JPSS Ground System shall log operations activities for each service provided including scheduled activity preparation, execution and performance.

Rationale: The JPSS Ground System requires that a record of the actual services provided and the associated performance measures are recorded and maintained.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-1710 The JPSS Ground System shall predict Radio Frequency Interference (RFI) events between JPSS-managed satellites and known other satellite systems.

Rationale: Prediction of RFI events is necessary to ensure communications integrity and non-interference by JPSS with other satellites or by other satellites with JPSS.

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

3.5.5 Mission Planning

GSR-81 The JPSS Ground System shall perform Mission Planning and Scheduling for the JPSS Program.

Rationale: A core requirement of the JPSS Ground System is to plan and schedule the resources necessary to operate the system and provide data to end users. Note that some assets are not under the direct control of the JPSS Ground System and coordination must be done to ensure the availability of data and resources.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-644 The JPSS Ground System shall schedule sensor Calibration/Validation activities.

Rationale: In order to consistently meet quality and precision requirements the JPSS Ground System must be able to schedule required updates to flight system Calibration/Validation operations to assess flight system performance.

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

GSR-83 The JPSS Ground System shall coordinate with external programs to perform the Mission Planning and Scheduling of JPSS resources.

Rationale: Some assets are not under the direct control of the JPSS Ground System and coordination must be done to ensure the availability of data and resources.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-88 The JPSS Ground System shall maintain a JPSS master schedule.

Rationale: The master schedule should include all scheduled activities and services both within the ground system and those scheduled with external entities. The master schedule is a critical aspect of ground system operations.

Mission Effectivity: S-NPP, DMSP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

GSR-137 The JPSS Ground System shall generate schedules detailing the configuration of assets necessary to provide services.

Rationale: Schedules should provide sufficient detail to identify the equipment, resources and staff necessary to achieve each scheduled item.

Mission Effectivity: S-NPP, DMSP, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2

3.5.6 Manage M&O Node

GSR-102 The JPSS Ground System shall store all data transmitted to JPSS-managed satellites for the life of the program.

Rationale: The JPSS Ground System must retain all transmitted data for the life of the program. A record of all commands, command loads and table loads must be maintained for each JPSS satellite, along with any responses or assessments on the success of the action from the flight

system or ground control systems. This data is important for auditing activities and to aid in fault diagnosis.

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

GSR-112 The JPSS Ground System shall centrally archive all operations data for the life of the program.

Rationale: Data must be retained in on-line storage to facilitate retrieval for normal operations and be archived to allow retrieval of historical data. CLASS is the central system for providing archival storage of observational products. On-line data is defined here as SMD, stored telemetry, MSD, and SMD products that are available in short term storage areas of CGS whereas archival storage is all data that is stored at CLASS.

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.6 Data Processing Node

3.6.1 Collect Data Product Input

GSR-49 The JPSS Ground System shall ingest stored mission data from JPSS SMD Hub.

Rationale: JPSS must deliver a complete set of data products from the S-NPP and JPSS Satellites. JPSS must generate RDRs for the GCOM-W1 satellite.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3398 The JPSS Ground System shall support instruments with configurable data rates as defined in the JPSS-1 MDFCB (472-00251).

Rationale: JPSS GS must provide a configurable ingest process to handle changes in instrument data rates should Flight choose to change those onboard data rates.

Mission Effectivity: JPSS-1

GSR-3399 The JPSS Ground System shall support instruments with configurable data rates defined in the NPP MDFCB (429-05-02-42).

Rationale: JPSS GS must provide a configurable ingest process to handle changes in instrument data rates should Flight choose to change those onboard data rates.

Mission Effectivity: S-NPP

GSR-3400 The JPSS Ground System shall implement decompression for all compressed instrument data received from the satellite.

Rationale: JPSS GS must decompress any compressed instrument data prior to the generation of higher-order data products.

Mission Effectivity: S-NPP, JPSS-1

GSR-3401 The JPSS Ground System shall support multiple APIDs from a given instrument in support of lossless data compression or uncompressed data coming from a given instrument.

Rationale: JPSS GS must be able to handle the use of separate APIDs for compressed or uncompressed data coming from a given vehicle instrument. The exception to this case is NPP VIIRS which is using a single APID with a bit set in the secondary header to indicate compression.

Mission Effectivity: S-NPP, JPSS-1

3.6.2 Produce Data Products

GSR-2320 The JPSS Ground System shall produce an EDR from the available data.

Rationale: The EDR may be degraded. However, delivery of the degraded product is still required along with a flag indicating the degraded quality.

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

GSR-3354 The JPSS Ground System shall be configurable to select either official or alternate ancillary data for the generation of data products.

Rationale: DPN can utilize alternate ancillary data instead of the official ancillary data when those are not available or lesser quality. The resulting alternate products are in lieu of the official products and do not impact the DPN processing and storage usage. They are not required to meet all quality or performance requirements. They must be identified as alternate on the product name and metadata.

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

GSR-113 The JPSS Ground System shall provide capacity for on-line storage of all science product related data storage for a minimum of seven days.

Rationale: The JPSS Ground System must have sufficient storage capacity to allow normal operations while archiving data. Frequently accessed data must remain in on-line storage until transferred to the central archive.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-335 The JPSS Ground System shall format data products in accordance with the JPSS Algorithm Specification Volume II: Data Dictionary (474-00448-02-01 through 474-00448-02-30).

Rationale: The relevant Algorithm Specification, Volume II Data Dictionary determines what artifacts are needed on a per-product basis.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1197 The JPSS Ground System shall produce RDRs for GCOM W-1 in accordance with the GSRD Volume 2.

Rationale: Reference the NOAA Guidance Letter 2/16/2012 requires RDRs only from JPSS Ground System.

Mission Effectivity: GCOM-W1

GSR-3156 In support of graceful degradation, the JPSS Ground System shall be capable of generating data products that may not meet specified algorithm performance requirements.

Rationale: When primary inputs are not available for data product processing, products need to be generated using secondary or tertiary inputs as specified in the EDR IR. These degraded products are not required to meet the algorithm performance requirements.

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

GSR-19 The JPSS Ground System shall produce data products for S-NPP in accordance with the GSRD Volume 2.

Rationale: The specific data records are detailed in the GSRD Volume 2.

Mission Effectivity: S-NPP

GSR-3236 The JPSS Ground System shall produce data products for JPSS satellites in accordance with the GSRD Volume 2.

Rationale: The specific data records are detailed in the GSRD Volume 2.

Mission Effectivity: JPSS-1, JPSS-2

GSR-3209 JPSS Ground System shall produce data products per GSRD Volume 2 from all secondary operational sensors on JPSS-managed satellites concurrently.

Rationale: The Ground System must produce products from the operational sensors on two different satellites concurrently during the Calibration/Validation period which may last up to one year. It is possible that the primary operational sensors could be divided between two satellites, e.g., a VIIRS, CrIS and ATMS on JPSS-1 and an OMPS on S-NPP. If this situation exists when JPSS-2 is launched, a VIIRS could be still be an operational secondary sensor on S-NPP, which would require processing VIIRS from 3 satellites until the J-2 Calibration/Validation period is over and a decision is (or is not) made to turn VIIRS off on S-NPP.

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

GSR-1737 The JPSS Ground System shall ensure that the recovery of missed data shall not impact the delivery of data that can still meet EDR latency requirements.

Rationale: The JPSS Ground System must continue to deliver data and meet latency while concurrently recovering and processing damaged or missed data.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1747 The JPSS Ground System shall produce a quality flag to indicate the application and identity of a degradation condition to a retrieved value in a data record.

Rationale: The JPSS Ground System must indicate when a degradation condition has occurred.

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

GSR-1750 The JPSS Ground System shall produce a quality flag to indicate the application and identity of an exclusion condition to a retrieved value in a data record.

Rationale: The JPSS Ground System must indicate when an exclusion condition has occurred.

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

GSR-1736 In a missed pass scenario, the JPSS Ground System shall recover data on subsequent passes.

Rationale: The JPSS Ground System must continue to deliver data and meet latency while concurrently recovering and processing damaged or missed data.

Mission Effectivity: S-NPP, JPSS-1

3.6.3 Distribute Data Products

GSR-1240 The JPSS Ground System shall deliver data products including all xDR associated descriptive information (e.g., metadata) to CLASS for long term storage.

Rationale: CLASS is a designated storage for JPSS observational data and supporting data.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3200 The JPSS Ground System shall deliver RDRs and Metadata to the Science Data Segment (SDS).

Rationale: SDS requires JPSS data products and supporting data.

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

GSR-3170 The JPSS Ground System shall deliver data products to the NESDIS ESPC.

Rationale: NESDIS ESPC requires JPSS data products and supporting data.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3172 The JPSS Ground System shall make available SMD APs to the FNMOC.

Rationale: FNMOC requires JPSS observational data in order to produce EDRs.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3173 The JPSS Ground System shall make available SMD APs to the NAVOCEANO.

Rationale: NAVOCEANO requires JPSS data in order to produce EDRs.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

3.6.4 Manage Product Generation and Distribution

GSR-3239 The JPSS Ground System shall be configurable to make data products available to authorized users.

Rationale: The Ground System need to be able to restrict the availability of certain products (e.g., GCOM-W1 RDR) to certain recipients, or classes of recipients. Authorized recipients will be as directed by the JPSS Ground Project.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

3.6.5 Manage Data Processing

Please see GSRD Volume 2 Section 3.9 - Environmental Processing Group.

3.6.6 Data Assurance

GSR-673 The JPSS Ground System shall provide a process for recovery of damaged or missing SMD data from JPSS-managed assets.

Rationale: To ensure the integrity of data products it will be necessary to attempt to recover missing or damaged data. For GCOM-W1, only retransmitted internal to the ground system.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1654 The JPSS Ground System shall provide data quality monitoring capability at the NSOF.

Rationale: The data quality threshold files produced are used during the production of data products to support data product quality analysis.

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

3.7 Simulation Node

3.7.1 Simulate Flight Operations

GSR-828 The JPSS Ground System shall develop and maintain a simulation capability consisting of a high fidelity authentic simulation of the spacecraft, instruments, and ground system.

Rationale: The JPSS Ground System must include a high fidelity simulation capability that is similar in form, fit, function, and timing to the actual spacecraft and instruments.

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

GSR-1605 The JPSS Ground System shall be capable of simulating command and control of three satellites simultaneously.

Rationale: Simulation of the operational constellation is required to support studies, assess changes in capabilities, and to assist in anomaly resolutions. Multiple simulators may be needed in order to meet this requirement.

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

GSR-1199 The JPSS Ground System simulation capability shall support validation of the Flight Products.

Rationale: The simulation capability has to support validation of the JPSS-managed flight products.

Mission Effectivity: JPSS-1, JPSS-2

GSR-1200 The JPSS Ground System simulation capability shall support verification and validation of the JPSS Ground System.

Rationale: The simulation capability has to support ground system evolution through testing.

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

GSR-1201 The JPSS Ground System simulation capability shall support JPSS pre- and post-launch operations (Launch minus 12 months through decommissioning) and Mission Availability over the mission lifetime.

Rationale: The simulation capability has to support the full life cycle development and operations.

Mission Effectivity: JPSS-1, JPSS-2

GSR-1202 The JPSS Ground System simulation capability shall execute the Flight Software (Spacecraft and Instruments) and the Ground Software.

Rationale: The simulation capability must provide a realistic environment for replicating system behavior (functional). FVS can partially do this. Runs the S/C FSW and the VIIRS FSW.

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

GSR-1203 The JPSS Ground System simulation capability shall exhibit real-time response behavior with respect to operation of the JPSS-managed satellites.

Rationale: The simulation capability must provide a realistic environment for replicating system behavior (timing).

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

GSR-1212 The JPSS Ground System simulation capability shall support operator training and certification.

Rationale: Must provide the capability to train and certify operations personnel.

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

GSR-1213 The JPSS Ground System simulation capability shall support anomaly investigation.

Rationale: Must provide capability to investigate system anomalies.

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

3.7.2 Manage Simulators

GSR-156 The JPSS Ground System shall provide access to spacecraft simulators for all authorized mission users.

Rationale: Access to spacecraft simulators for all controlled spacecraft is necessary to validate commands prior to execution and for fault analysis.

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

GSR-1214 The JPSS Ground System simulation capability shall be configurable by operations personnel.

Rationale: Should be able to switch between modes of operations (e.g., training, anomaly resolution) without software modification.

Mission Effectivity: JPSS-1, JPSS-2

GSR-1215 The JPSS Ground System simulation capability shall be re-configured to a new state within two hours.

Rationale: Need to bound the time required to transition the purpose of the simulator (e.g. training, anomaly resolution)

Mission Effectivity: JPSS-1, JPSS-2

3.8 Calibration/Validation Node

3.8.1 Acquire Cal/Val Data

Note: Requirements for this activity are located in section 3.2.1

3.8.2 Maintain & Calibrate Algorithms

GSR-642 The JPSS Ground System shall monitor and report sensor performance in terms of calibration/validation metrics.

Rationale: The monitoring and reporting of sensor performance is critical to ensuring JPSS observational products consistently meet quality and precision requirements. The operational reporting of sensor performance parameters critical to data product performance is largely accomplished through the use of data product quality flags.

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

GSR-1227 The JPSS Ground System shall validate Algorithm/Table Change Packages for operational algorithms.

Rationale: Throughout the life of JPSS satellites changes to tables and algorithms will be required due to a variety circumstances such as satellite limitations or degraded sensor capabilities. When those changes are necessitated, the Ground System is responsible for generating and testing them and then delivering them into the operational environment.

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

GSR-643 The JPSS Ground System shall monitor data products and reports in accordance with the GSRD Volume 2.

Rationale: Monitoring ground system data products are critical to ensuring JPSS observational products consistently meet quality and precision requirements. The operational reporting of algorithm performance parameters critical to data product performance is largely accomplished through the use of data product quality flags.

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

GSR-645 The JPSS Ground System shall verify algorithm and table updates.

Rationale: In order to consistently meet quality and precision requirements the JPSS Ground System must verify that all algorithm updates meet the specified quality and accuracy requirements.

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

GSR-648 The JPSS Ground System shall produce flight system calibration data updates.

Rationale: The JPSS Ground System will generate flight segment calibration/validation configuration data as needed to consistently meet the specified quality and accuracy requirements.

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

GSR-649 The JPSS Ground System shall produce ground system calibration data updates.

Rationale: The JPSS Ground System will generate ground segment calibration/validation configuration data as needed to consistently meet the specified quality and accuracy requirements.

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

3.8.3 Manage Cal/Val Node

GSR-651 The JPSS Ground System shall generate State of Health data for the Cal/Val node.

Rationale: In order to achieve operational situational awareness the calibration/validation node of the JPSS Ground System must provide regular State of Health information to operations.

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

GSR-652 The JPSS Ground System shall provide the infrastructure necessary to perform calibration and validation.

Rationale: In order to consistently meet quality and precision requirements the JPSS Ground System must provide the environment, tools and services to perform calibration and validation.

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

3.9 Field Terminal Support Node

3.9.1 Support FT Operations

GSR-334 The JPSS Ground System shall provide a library for Field Terminal related specifications for access by Field Terminal Users.

Rationale: The JPSS Ground System must provide the Field Terminal user community specifications for hardware/software, antenna, and storage requirements, needed to receive the direct broadcast data.

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

3.9.2 Support FT Software

GSR-2319 The JPSS Ground System shall make available to the Field Terminal User Community ground processing software and algorithms to enable Field Terminal Users to process direct broadcast data.

Rationale: The JPSS Ground Project will provide the Field Terminal user community processing software/algorithms for processing received direct broadcast data.

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

3.9.3 Direct Broadcast Monitoring

GSR-1175 The JPSS Ground System shall monitor the HRD Direct Broadcast from JPSS-managed satellites for a minimum of 3 times per day per satellite.

Rationale: Monitoring of the HRD is required to ensure that the service is functional and that the data being provided is what the recipients expect with regard to quality and timeliness. The link will be checked 3 times per day.

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

3.10 Continuity of Operations

3.10.1 Provide Continuity of Operations

GSR-3201 The JPSS Ground System shall provide backup ground system capabilities including command, control and data processing in support of Continuity of Operations (COOP) at the Consolidated Backup (CBU) facility in Fairmont, WV.

Rationale: NOAA COOP plans ensure the continuance of mission essential functions at an alternate facility in the event of a COOP incident. Reference: 7/11/12 -Guidance letter and L1RD CRM. This includes simulation capability.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-400 The JPSS Ground System shall maintain an alternate Management and Operations Node that is functionally identical to the primary Management and Operations node as part of the CBU.

Rationale: COOP requires designated national assets to remain operational in the event of regional conditions that can impact primary resources (e.g., natural disasters, infrastructure outages, etc.). The JPSS Ground System performs primary operations out of the NSOF. A complete operational backup for all Management and Operations functions will be established at an alternate site. GRAVITE & SDS support is not provided at CBU, and there may be reduced data production.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-3202 The Alternate Data Processing Node (DPN) of the JPSS Ground System shall deliver data to the CLASS Point of Presence (PoP) at CBU.

Rationale: This requirement addresses interfaces during contingency operations; the CLASS will be served during Contingency.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3203 The Alternate Data Processing Node (DPN) of the JPSS Ground System shall deliver data to the NESDIS ESPC – NDE Point of Presence (PoP) at CBU.

Rationale: This requirement addresses interfaces during contingency operations; the NDE will be served during Contingency.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3205 The JPSS Ground System shall provide SMD APs to FNMOC Point of Presence at the CBU.

Rationale: This requirement addresses interfaces during contingency operations; the FNMOC will be served during Contingency.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-3206 The JPSS Ground System shall provide SMD APs to NAVOCEANO Point of Presence at the CBU.

Rationale: This requirement addresses interfaces during contingency operations; the Naval Oceanographic Office will be served during Contingency.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1221 The JPSS Ground System shall deploy an alternate Data Processing Node (DPN) with the same capabilities as the primary DPN, as part of the CBU capability to fulfill Continuity of Operations (COOP).

Rationale: COOP requires designated national assets to remain operational in the event of regional conditions that can impact primary resources (e.g., natural disasters, infrastructure outages, etc.). The JPSS Ground System performing data processing at the alternate DPN must continue to provide operational data products to CLASS, ESPC (NDE) and DoD as required. The alternate DPN interfaces do not include SDS and GRAVITE.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-402 The JPSS Ground System shall transition full operations between the COOP and primary facilities in less than 12 hours.

Rationale: The system must be able to switch to the COOP location and back to Primary for operations within a maximum time period. This implies the system is fully synchronized prior to the transition between locations.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-1682 The JPSS Ground System shall provide for configurable data synchronization between the primary and alternate locations.

Rationale: The end state environment must have the most current data to perform effectively. Includes alternate MON and DPN. Synchronization may occur nominally on a daily basis.

Mission Effectivity: S-NPP, DMSP, GCOM-W1, JPSS-1, JPSS-2

GSR-1683 The JPSS Ground System alternate Management and Operations Node shall be capable of being remotely configurable from the primary Management and Operations Node.

Rationale: Operators that may be physically located at the primary facility may need to configure the alternate MON or DPN. Therefore the alternate Management and Operations Node must be remotely configurable.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-1684 The JPSS Ground System alternate Data Processing Node shall be capable of being remotely configurable from the primary Data Processing Node.

Rationale: Operators that may be physically located at the primary facility may need to execute operations out of the alternate MON or DPN. Therefore the alternate Data Processing Node must be remotely configurable.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1685 The JPSS Ground System alternate Management and Operations Node shall be capable of being remotely operable from the primary Management and Operations Node.

Rationale: Operators that may be physically located at the primary facility may need to execute operations out of the alternate MON or DPN. Therefore the alternate Management and Operations Node must be remotely configurable.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

GSR-1686 The JPSS Ground System alternate Data Processing Node shall be capable of being remotely-operable from the primary Data Processing Node.

Rationale: Operators that may be physically located at the primary facility may need to execute operations out of the alternate MON or DPN. Therefore the alternate Data Processing Node must be remotely configurable.

Mission Effectivity: S-NPP, GCOM-W1, JPSS-1, JPSS-2

GSR-1687 The JPSS Ground System shall have timely ancillary data at the alternate DPN during COOP conditions.

Rationale: Ancillary data is required at the COOP site just as it is as the primary location.

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

GSR-403 The JPSS Ground System shall support operations out of the COOP facility for at least 30 consecutive days during each COOP event.

Rationale: The 30-day definition of a long term deployment is consistent with National-level guidance requiring a 30-day operational capability at remote backup sites.

Mission Effectivity: S-NPP, DMSP, Metop, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

3.11 Security

GSR-682 The JPSS Ground System shall meet security requirements per NIST 800-53 in accordance with the JPSS Ground System Security Requirements Document (470-00094).

Rationale: The JPSS ground system implements controls compliant to National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53, Recommended Security Controls for Federal Information Systems and Organizations in accordance with JPSS Program L1RD and FISMA 2002 (1).

Mission Effectivity: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, NSF

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, block end, and method(s) for verifying each requirement.

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-795	The JPSS Ground System shall provide concurrency of operations.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE KSAT AGS	2.0.0	5.0.0	Test	NA
GSR-71	The JPSS Ground System shall manage JPSS satellites as an integrated fleet.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	Test
GSR-302	The JPSS Ground System shall generate State of Health (SOH) data for all JPSS Ground System functional nodes.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS GRAVITE AGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-395	The JPSS Ground System shall ensure operations have complete and timely reporting on scheduled activity preparation, execution and performance.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS KSAT AGS	2.0.0	5.0.0	Analysis	Analysis
GSR-396	The JPSS Ground System shall ensure operations have complete and timely reporting on faults within the JPSS-managed flight/ground resources.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE	2.0.0	5.0.0	Test	NA
GSR-397	The JPSS Ground System shall ensure operations have complete and timely reporting on JPSS-managed Flight/Ground resources experiencing degraded capacity.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-126	The JPSS Ground System shall provide JPSS operators with an integrated set of displays that provide global situational awareness for all JPSS-managed flight/ground assets.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS KSAT	2.0.0	5.0.0	Test	Test
GSR-107	The JPSS Ground System shall provide automated control of JPSS operational resources.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration Inspection	NA
GSR-108	The JPSS Ground System shall provide manual control of JPSS operational resources.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration Inspection	NA
GSR-63	For nominal operations, the JPSS Ground System shall encrypt commands to the S-NPP satellite using Caribou encryption.	Functional	S-NPP	CGS	2.0.0	5.0.0	Inspection	NA
GSR-1558	For nominal operations, the JPSS Ground System shall encrypt the commands to the JPSS-managed satellites using a NIST FIPS 140-2 certified AES algorithm uplink security system that uses 256 bit keys.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-252	The JPSS Ground System shall ensure all flight commands for JPSS-managed satellites have been authenticated prior to execution.	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0	Test	NA
GSR-466	The JPSS Ground System shall have an operational life through at least FY 2025.	Non-Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	Ground Project	2.0.0	5.0.0	Analysis	NA
GSR-830	The JPSS Ground System shall control data flows between the operational environment and other environments.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 NSF	CGS FVTS GRAVITE	2.0.0	5.0.0	Demonstration	NA
GSR-831	The JPSS Ground System shall provide the functionality to perform simulations, integration and testing without impact to operations.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 NSF	CGS FVTS GRAVITE	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3260	The JPSS Ground System shall utilize a reliable transmission protocol.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0	Analysis	NA
GSR-149	The JPSS Ground System shall use WGS 84 as the geodetic system in accordance with the Department of Defense World Geodetic System 1984 Technical Report, (NIMA TR-8350.2).	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-292	The JPSS Ground System shall employ a system time convention based on the US Naval Observatory (USNO) definition of Coordinated Universal Time [UTC (USNO)] in accordance with the ITU-R TF.460-6, Standard-frequency and time-signal emissions including the leap second convention.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0	Test	NA
GSR-293	The JPSS Ground System on-orbit coordinate system shall use a right-hand, orthogonal, body-fixed XYZ coordinate system as follows: the +Z axis is downward towards nadir, the Y-axis is along the orbit normal plane (+Y is opposite the orbital angular momentum), and the X-axis is along the spacecraft velocity vector (+X toward the direction of spacecraft travel).	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS GRAVITE	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-294	The JPSS Ground System shall be IPV6 capable.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-295	The JPSS Ground System shall use the Earth-centered J2000 inertial coordinate system for attitude knowledge and orbit reference.	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS GRAVITE AGS	2.0.0	5.0.0	Inspection	NA
GSR-296	The JPSS ground system shall exclusively use lossless data compression techniques when data must be compressed.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3213	The JPSS Ground System shall implement the CCSDS Space Link Extension in accordance with the following CCSDS SLE Return Service and Forward Service Specifications: A. Return All Frames Service Specification B. Return Channel Frames Service Specification C. Forward CLTU Service Specification	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1692	The JPSS Ground System shall use the metric system of measurement as required by NPD 7120.4D, NASA Engineering and Program/Project Management Policy.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS GRAVITE AGS Algorithm Provider	2.0.0	5.0.0	Inspection	NA
GSR-3307	The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to FNMOC Point of Presence measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3308	The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to NAVOCEANO Point of Presence measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3369	For GCOM-W1, the JPSS Ground System shall make at least 99.9% of the SMD captured at the ground RF receiving point available to the FNMOC Point of Presence measured over a 30-day period.	Performance	GCOM-W1	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3370	For GCOM-W1, the JPSS Ground System shall make at least 99.9% of the SMD captured at the ground RF receiving available to the NAVOCEANO Point of Presence measured over a 30-day period.	Performance	GCOM-W1	CGS	2.0.0	5.0.0	Analysis Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1246	The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to the Comprehensive Large Array-data Stewardship System (CLASS) measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3383	The JPSS Ground System shall provide at least 99% of all deliverable products to the Comprehensive Large Array-data Stewardship System (CLASS) measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3384	The JPSS Ground System shall provide at least 99% of all deliverable products to ESPC measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3385	The JPSS Ground System shall provide at least 99% of all deliverable products to SDS measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3309	The JPSS Ground System shall make APs from S-NPP available to the user's Point of Presence (PoP) within 120 minutes of the observation time for at least 95% of the APs intended for that user measured over a 30-day period.	Performance	S-NPP	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3310	The JPSS Ground System shall make APs from JPSS-1/JPSS-2 available to the user's Point of Presence within 70 minutes of the observation time for at least 95% of the APs intended for that user measured over a 30-day period.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1422	The JPSS Ground System shall make JPSS EDRs available at the JPSS GS interface for each official external mission data consumer within 80 minutes of the observation time for at least 95% of the EDRs generated over a 30-day period.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3391	The JPSS Ground System shall provide at least 99% of all requested deliverable products to GRAVITE measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2		2.0.0	3.0.0	Analysis Test	NA
GSR-1696	The JPSS Ground System shall provide at least 99.9% of the GCOM-W1 SMD captured at the ground RF receiving point to CLASS measured over a 30-day period.	Performance	GCOM-W1	CGS KSAT	2.0.0	5.0.0	Analysis Test	NA
GSR-1243	The JPSS Ground System shall meet an operational availability (Ao) of 99% measured over a 30-day period.	Performance	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Analysis	NA
GSR-1554	The JPSS Ground System Space/Ground Communications Node shall have an operational availability (Ao) of 99.5% measured over a 30-day period.	Performance	DMSP	CGS	2.0.0	5.0.0	Analysis	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1306	The JPSS Ground System's Ground Network Node shall provide WAN services with a 99.9% Ao measured over a 30-day period.	Performance	S-NPP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis	NA
GSR-3352	The JPSS Ground System Ground Network Node shall have an operational availability from McMurdo for each effective mission of at least a 99.5% Ao measured over a 30-day period.	Performance	DMSP Metop SCaN NSF	Ground Project	2.0.0	3.0.0	Analysis	NA
GSR-1307	The JPSS Ground System Management and Operations Node shall have an operational availability (Ao) of 99.9% measured over a 30-day period.	Performance	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 NSF	CGS AGS	2.0.0	5.0.0	Analysis	NA
GSR-1308	The JPSS Ground System Data Processing Node shall have an operational availability (Ao) of 99.9% measured over a 30-day period.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS NAB	2.0.0	5.0.0	Analysis	NA
GSR-1309	The JPSS Ground System Simulation Node shall have an operational availability (Ao) of 95% measured over a 30-day period.	Performance	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1310	The JPSS Ground System Calibration/Validation Node shall have an operational availability (Ao) of 95% measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Analysis	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1311	The JPSS Ground System Field Terminal Support Node shall have an operational availability (Ao) of 95% measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	FTS	2.0.0	5.0.0	Analysis	NA
GSR-1238	The JPSS Ground System shall incorporate 99.9% of the RDRs meeting processing thresholds in the production of SDRs, TDRs, and EDRs at the NESDIS Data Processing Node measured over a 30-day period.	Performance	S-NPP JPSS-1 JPSS-2	CGS SPS	2.0.0	5.0.0	Analysis Test	NA
GSR-1239	The JPSS Ground System shall generate RDRs from all non-fill Application Packets.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-1697	For GCOM-W1, the JPSS Ground System shall provide at least 99.9% of all deliverable products based on the SMD captured at the ground RF receiving point to ESPC measured over a 30-day period.	Performance	GCOM-W1	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-1421	The JPSS Ground System shall make S-NPP EDRs available at the JPSS GS interface for each official external mission data consumer within 140 minutes of the observation time for at least 95% of the EDRs generated over a 30-day period.	Performance	S-NPP	CGS NAB	2.0.0	5.0.0	Analysis Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3377	The JPSS Ground System shall produce S-NPP RDRs within 120 minutes of observation time of the latest sensor data used in the creation of an RDR for at least 95% of the RDRs generated over a 30-day period.	Performance	S-NPP	CGS NAB	2.0.0	5.0.0	Analysis Test	NA
GSR-3378	The JPSS Ground System shall produce SDRs using S-NPP data within 140 minutes of the observation time of the latest sensor data used in the creation of an SDR for at least 95% of the SDRs generated over a 30-day period.	Performance	S-NPP	CGS NAB	2.0.0	5.0.0	Analysis Test	NA
GSR-3379	The JPSS Ground System shall produce TDRs using S-NPP data within 140 minutes of the observation time of the latest sensor data used in the creation of a TDR for at least 95% of the TDRs generated over a 30-day period.	Performance	S-NPP	CGS NAB	2.0.0	5.0.0	Analysis Test	NA
GSR-1562	The JPSS Ground System shall make GCOM-W1 RDRs available to the NESDIS ESPC in less than 12 minutes of the ground receiving time of the latest Application Packet in each RDR for at least 95% of the RDRs measured over a 30-day period.	Performance	GCOM-W1	CGS NAB	2.0.0	5.0.0	Analysis Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3314	The JPSS Ground System shall make APs from GCOM-W1 available to the user's Point of Presence within 12 minutes of the ground receiving time for at least 95% of the APs intended for that user measured over a 30-day period.	Performance	GCOM-W1	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3371	The JPSS Ground System shall produce SDRs within 80 minutes of the observation time of the latest sensor data used in the creation of an SDR for at least 95% of the SDRs generated over a 30-day period.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3372	The JPSS Ground System shall produce TDRs within 80 minutes of the observation time of the latest sensor data used in the creation of a TDR for at least 95% of the TDRs generated over a 30-day period.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3373	The JPSS Ground System shall produce JPSS RDRs within 70 minutes of observation time of the latest sensor data used in the creation of an RDR for at least 95% of the RDRs generated over a 30-day period.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1663	The JPSS Ground System shall provide data communications service between the JPSS interface at the Svalbard Ground Station and the JPSS interface in the Continental U.S. (CONUS) that has an availability of no less than 99.95% averaged over a 30-day period.	Performance	S-NPP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN	CGS	2.0.0	5.0.0	Analysis	NA
GSR-311	The JPSS Ground System shall include data processing capacity to process retransmitted data concurrently while processing current operational data.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-312	The JPSS Ground System shall include data communication capacity to retransmit data concurrently with transmission of current operational data.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-164	The JPSS Ground System shall include resources to perform maintenance without impact to operational services.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-168	The JPSS Ground System shall include resources to conduct training activities without impact to operational services.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Inspection	NA
GSR-309	The JPSS Ground System shall have sufficient resources to perform commissioning of one JPSS-managed spacecraft while not impacting the simultaneous performance of ongoing operations.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE AGS	2.0.0	5.0.0	Test	NA
GSR-310	The JPSS Ground System shall have capacity to complete on-orbit calibration and validation of satellite following launch without impact to ongoing operations.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE AGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3211	The JPSS Ground System shall be scalable such that the services being provided can be extended to include up to seven JPSS-managed missions, five Data Processing Services missions and seven Data Acquisition and Routing missions.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0	Analysis	NA
GSR-3229	The JPSS Ground System shall provide a minimum operational margin of 50% for the Data Processing Node throughout.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3230	The JPSS Ground System shall provide a minimum operational margin of 25% for the Space/Ground Communications Node, Management and Operations Node, and Data Processing Node storage.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3231	The JPSS Ground System shall provide a minimum operational margin of 20% for Management and Operations Node peak total CPU capacity.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3232	The JPSS Ground System shall provide a minimum operational margin of 20% for Management and Operations Node peak total memory capacity.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-2309	The JPSS Ground System shall provide sufficient receptors at the McMurdo Ground Station (MGS) to support mission data acquisition for up to two DMSP satellites.	Functional Performance	DMSP	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-162	The JPSS Ground System shall provide a training environment that mimics the operational environment.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-200	The JPSS Ground System training environment shall be configurable without software releases or code changes (i.e., data driven).	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS	2.0.0	5.0.0	Demonstration	NA
GSR-196	When transitioning JPSS Ground System resources to a new release for operations, the JPSS Ground System shall revert to the prior operational configuration within five minutes of being commanded in case of anomalies with the new capabilities.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Test	NA
GSR-3375	The JPSS Ground System shall transition operations between the primary operating environment and the secondary operating environment within five minutes of initiation.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Test	NA
GSR-1712	The JPSS Ground System shall provide a library of configuration-managed artifacts for the operational JPSS System.	Non-Functional	S-NPP JPSS-1 JPSS-2	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3564	The JPSS Ground System shall comply with the Joint Polar Satellite System (JPSS) Government Resource for Algorithm Verification, Integration, Test and Evaluation (GRAVITE) to STAR Central Data Repository (SCDR) Interface Requirement Document (IRD) (474-00990).	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Inspection Test	NA
GSR-3214	The JPSS Ground System shall interface with the Attitude Ground System in accordance with the JPSS CGS to AGS IRD (474-00316).	Interface	S-NPP JPSS-1 JPSS-2	CGS AGS	2.0.0	5.0.0	Inspection Test	NA
GSR-2	The JPSS Ground System shall interface with the NESDIS ESPC in accordance with the JPSS GS to NESDIS ESPC IRD (474-00303).	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS NAB	2.0.0	5.0.0	Inspection Test	Test
GSR-2326	The JPSS Ground System shall interface with SCaN-managed missions in accordance with the JPSS GS to NASA SCaN IRD (474-00307).	Interface	SCaN	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-3	The JPSS Ground System shall interface with CLASS in accordance with the JPSS GS to CLASS IRD (474-00302).	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0	Inspection Test	Test
GSR-10	The JPSS Ground System shall interface with the NASA SDS in accordance with the JPSS GS to NASA SDS IRD (474-00304).	Interface	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection Test	Test

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-203	The JPSS Ground System shall interface with the Naval Oceanographic Office in accordance with the JPSS GS to NAVOCEANO IRD (474-00315).	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-204	The JPSS Ground System shall interface with the Fleet Numerical Meteorology and Oceanography Center (FNMOC) as defined in the JPSS GS to FNMOC IRD (474-00314).	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-221	The JPSS Ground System shall interface with the NOAA/NESDIS FCDAS for JPSS-managed satellites in accordance with the JPSS GS to NESDIS FCDAS IRD (474-00305).	Interface	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-224	The JPSS Ground System shall interface with the DMSP in accordance with the JPSS GS to DMSP IRD (474-00308).	Interface	DMSP	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-225	The JPSS Ground System shall interface with the MetOp Mission in accordance with the JPSS GS to EUMETSAT IRD (474-00309), the Meteorological Operational Satellite (MetOp) Network Requirements Document (NRD) (474-REF-00401), and the EUMETSAT EPS-NOAA ADA Operations ICD (474-REF-00663).	Interface	Metop	CGS	2.0.0	5.0.0	Inspection Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-228	The JPSS Ground System shall interface with the Coriolis/WindSat Mission in accordance with the JPSS GS to Coriolis/WindSat IRD (474-00313).	Interface	Coriolis/WindSat	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-2322	The JPSS Ground System shall comply with the JPSS CGS to FVTS IRD (474-00222).	Interface	S-NPP JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0	Inspection Test	NA
GSR-2323	The JPSS Ground System shall comply with the JPSS CGS to GRAVITE IRD (474-00200).	Interface	S-NPP JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0	Inspection Test	Test
GSR-208	The JPSS Ground System shall interface with the S-NPP Satellite TT&C S-band RF links in accordance with the S-NPP Spacecraft S-Band Radio Frequency Interface Control Document (ICD) to the Norway Ground Station (429-03-02-25).	Interface	S-NPP	CGS KSAT	2.0.0	5.0.0	Test	NA
GSR-1559	The JPSS Ground System shall interface with the JPSS Satellite TT&C S-band RF links in accordance with the IRD for RF Interfaces To and From JPSS Satellites (472-00173).	Interface	JPSS-1	CGS KSAT	2.0.0	5.0.0	Test	NA
GSR-3264	The JPSS Ground System shall interface with the JPSS Satellite Stored Mission Data (SMD) Ka-band RF link in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).	Interface	JPSS-1	CGS KSAT	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-209	The JPSS Ground System shall interface with the S-NPP Satellite TT&C S-band RF links in accordance with the NPP S-Band Data Format ICD (429-04-02-27).	Interface	S-NPP	CGS	2.0.0	5.0.0	Test	NA
GSR-210	The JPSS Ground System shall interface with the S-NPP Stored Mission Data (SMD) RF link in accordance with the NPP Spacecraft SMD ICD to the Norway Ground Station (429-03-02-26).	Interface	S-NPP	CGS	2.0.0	5.0.0	Test	NA
GSR-211	The JPSS Ground System shall interface with the S-NPP High Rate Data (HRD) RF link in accordance with the NPP Spacecraft High Rate Data RF ICD to the Direct-Broadcast Stations (429-03-02-24).	Interface	S-NPP	CGS	2.0.0	5.0.0	Test	NA
GSR-212	The JPSS Ground System shall interface with the S-NPP Stored Mission Data (SMD) and High Rate Data (HRD) RF links in accordance with the NPP X-Band Data Format Interface Control Document (ICD) (429-04-02-28).	Interface	S-NPP	CGS	2.0.0	5.0.0	Test	NA
GSR-233	The JPSS Ground System shall interface with White Sands in accordance with the Network Requirements Document for JPSS-1 (474-REF-00803) and the SN to JPSS C3S ICD (474-REF-00651).	Interface	JPSS-1	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-220	The JPSS Ground System shall interface with Kongsberg Satellite Services (KSAT) for TT&C and SMD in accordance with the JPSS GS to KSAT IRD (474-00109).	Interface	S-NPP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0	Inspection Test	NA
GSR-226	The JPSS Ground System shall interface with the McMurdo NSF in accordance with the JPSS GS to NSF IRD (474-00311).	Interface	NSF	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-232	The JPSS Ground System shall interface to the NASA Space Network for S-band TT&C services as defined in the Joint Polar Satellite System (JPSS) Command, Control, and Communications Segment (C3S) Interface Control Document (ICD) (474-REF-00651).	Interface	S-NPP	CGS	2.0.0	2.0.0	Test	NA
GSR-234	The JPSS Ground System shall interface to the NASA Flight Dynamics Facility as defined in the NRD for JPSS-1 (450-NRD-JPSS1).	Interface	JPSS-1	CGS	2.0.0	5.0.0	Inspection	NA
GSR-238	The JPSS Ground System shall interface with the JPSS Flight Project spacecraft and instrument support nodes for full life cycle support in accordance with the JPSS Ground Project to Flight Project IRD (474-00223).	Interface	S-NPP JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0	Inspection Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1220	The JPSS Ground System shall interface with NASA's Conjunction Assessment Risk Analysis (CARA) for conjunction assessment services directly in accordance with the JPSS GS CA IRD (474-00300).	Interface	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-250	The JPSS Ground System shall interface to the JPSS-1 Launch Facility in accordance with the JPSS-1 Launch Site Support Plan (LSP-PLN-333.01-JPSS-1-LSSP).	Interface	JPSS-1	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3315	The JPSS Ground System shall interface to the JPSS-2 Launch Facility in accordance with the JPSS-2 Launch Site Support Plan (TBR).	Interface	JPSS-2	CGS	3.0.0	5.0.0	NA	NA
GSR-822	The JPSS Ground System shall interface with the NOAA NSOF facility in accordance with the JPSS GS to NSOF Facilities IRD (474-00306).	Interface	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Inspection Test	NA
GSR-823	The JPSS Ground System shall interface with the NESDIS CBU facility in accordance with the JPSS GS to NESDIS CBU Facilities IRD (474-00310).	Interface	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Inspection Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1177	The JPSS Ground System shall uplink data to JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0	Test	NA
GSR-1182	The JPSS Ground System shall store uplink data at KSAT transmitting ground stations in accordance with the implementing agreement between NOAA and NSC on Cooperation (11/28/08 & 4/2/02).	Functional	S-NPP JPSS-1 JPSS-2	KSAT Ground Project	2.0.0	5.0.0	Test	NA
GSR-1178	The JPSS Ground System shall provide telemetry downlink processing.	Functional	S-NPP DMSP JPSS-1 JPSS-2	CGS KSAT Ground Project	2.0.0	5.0.0	Test	NA
GSR-1179	The JPSS Ground System shall acquire downlinks to receive telemetry from JPSS missions.	Functional	S-NPP DMSP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0	Test	NA
GSR-100	The JPSS Ground System shall retain all received satellite downlink data at the receiving ground station for a minimum of seven days.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0	Test	NA
GSR-1183	The JPSS Ground System shall acquire SMD from the JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0	Test	NA
GSR-3233	The JPSS Ground System shall acquire HRD from the JPSS satellite in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).	Functional	JPSS-1	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-253	The JPSS Ground System shall be capable of supporting operations over the TT&C S-Band forward and return links, while acquiring SMD return links and monitoring direct broadcast links simultaneously for any JPSS-managed satellite.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-481	The JPSS Ground System shall manage all Space/Ground Communication Node resources.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-622	The JPSS Ground System shall manage all Ground Network Node resources.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Analysis	NA
GSR-337	The JPSS Ground System shall provide network communications between the internal elements of the ground system.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-492	The JPSS Ground System shall provide voice communications circuits among JPSS facilities.	Functional	JPSS-1 JPSS-2	Ground Project	2.0.0	5.0.0	Demonstration	NA
GSR-2318	The JPSS Ground System shall make any MSD (e.g., satellite ephemeris, ancillary data) needed to produce xDRs available to the user community.	Functional Performance	S-NPP JPSS-1 JPSS-2	CGS FTS	2.0.0	5.0.0	Test	NA
GSR-338	The JPSS Ground System shall provide network communications to external elements for the exchange of mission data.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-284	The JPSS Ground System shall utilize Wide Area Network (WAN) services that only employ lossless compression techniques when compression is needed.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-1666	The JPSS Ground System shall collect DMSP data at McMurdo and relay to the DMSP Service Delivery Point.	Functional	DMSP	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1668	The JPSS Ground System shall provide Data Routing services.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-2331	The JPSS Ground System shall make GCOM-W1 mission data available to JAXA.	Functional	GCOM-W1	KSAT Ground Project	2.0.0	5.0.0	Test	NA
GSR-3316	The JPSS Ground System shall make 99% of GCOM-W1 mission support data available to JAXA, measured monthly.	Functional	GCOM-W1	KSAT Ground Project	2.0.0	5.0.0	Test	NA
GSR-3208	The JPSS Ground System shall store Mission Support Data (MSD) files for a minimum of seven days at the Data Processing Nodes.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3261	The JPSS Ground System shall provide Network Communication Services that meet a minimum throughput efficiency of 90%.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Analysis Test	NA
GSR-3282	The JPSS Ground System shall perform multimission SMD CCSDS SLE and CCSDS AOS processing (VCDU with header extensions and APID extraction) on SMD acquired by the JPSS Space Ground Communications Node at a central location.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3317	The JPSS Ground System shall remove duplicative data from the SMD acquired at the SMD Hub location.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3283	The JPSS Ground System shall extract application packet identifiers (APIDs) from VCDUs in accordance with the CCSDS AOS Spec.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3364	The JPSS Ground System at the Space/Ground Communications Node shall annotate all Virtual Channel Data Units (VCDUs) with ground receipt information.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3286	The JPSS Ground System shall forward configurable sets of SMD application packets to configured destinations.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-1674	The JPSS Ground System shall store non-duplicate SMD from JPSS-managed satellites for at least seven days.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3319	Upon request from authorized Hub users, the JPSS Ground System shall retransmit stored SMD.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3320	The JPSS Ground System SMD Hub shall notify operations regarding missing data from JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-404	The JPSS Ground System shall allow only a single command source at any given time for any JPSS-managed satellite.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-394	The JPSS Ground System shall ensure operations have complete and timely situational awareness of all JPSS Flight System resources.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-89	The JPSS Ground System shall perform command and control of JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	Test
GSR-154	The JPSS Ground System shall validate all flight system commands, table loads and flight software prior to upload to the satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-91	The JPSS Ground System shall manage the on-orbit configuration of all JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	Test
GSR-90	The JPSS Ground System shall assess all flight activities for JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-259	The JPSS Ground System shall configure the content of the TT&C downlinks for JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-260	The JPSS Ground System shall configure the content of the direct broadcast downlinks for JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-261	The JPSS Ground System shall configure the content of the SMD downlinks for JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-262	The JPSS Ground System shall maintain operational and residual satellites relative phasing.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-256	The JPSS Ground System shall manage all ground and flight system calibration products in order to meet data product quality requirements, as specified in the GSRD Volume 2.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Demonstration Inspection	NA
GSR-92	The JPSS Ground System shall manage the operational databases.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	Inspection
GSR-159	The JPSS Ground System shall utilize NASA's Space Network to provide concurrent full-orbit TT&C coverage for critical operations.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-153	The JPSS Ground System shall manage end-of-life satellite disposal in accordance with the NASA Procedural Requirements for Limiting Orbital Debris, (NPR 8715.6A) and the Process for Limiting Orbital Debris (NASA-STD-8719.14).	Functional	S-NPP JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0	Demonstration	NA
GSR-3234	The JPSS Ground System shall process S-band telemetry from JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3356	The JPSS Ground System shall process S-NPP X-band telemetry.	Functional	S-NPP	CGS	2.0.0	5.0.0	Test	NA
GSR-3357	The JPSS Ground System shall perform Ka-band AOS CCSDS preprocessing for the JPSS missions in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173) at each JPSS Ground Station.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3366	The JPSS Ground System shall acquire Telemetry at the JPSS CGS Ground Stations to enable extraction of the bit stream in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-146	The JPSS Ground System shall predict orbital events for all JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-140	The JPSS Ground System shall perform orbit determination for all JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-142	The JPSS Ground System shall verify the spacecraft on-board attitude determination solution for JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	AGS	2.0.0	5.0.0	Inspection	NA
GSR-34	The JPSS Ground System shall maintain the JPSS-managed satellites in the designated orbits as specified in the JPSS Program Level 1 Requirements Document (JPSS-REQ-1001).	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-152	The JPSS Ground System shall generate spacecraft maneuver commands for all mission phases.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-155	The JPSS Ground System shall utilize NASA CARA for collision avoidance alerts, planning and execution.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3402	The JPSS Ground System shall provide a time-tagged orbital position estimate accurate to 75/75/75 meters, 3 sigma for radial/in-track/cross-track components.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-3403	The JPSS Ground System shall provide a time-tagged attitude estimate accurate to 90 arcsec, 3 sigma per axis.	Functional	S-NPP JPSS-1 JPSS-2	AGS	2.0.0	5.0.0	Analysis Demonstration	NA
GSR-268	The JPSS Ground System shall provide the capability to perform trending on all aspects of JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS AGS	2.0.0	5.0.0	Demonstration	NA
GSR-114	The JPSS Ground System shall perform trending on the Ground System Status.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	Test
GSR-119	The JPSS Ground System shall allow operators to retrieve archived data based on user-defined search parameters.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-121	The JPSS Ground System shall provide analysis functions and tools for trend analysis over any user-defined time period from one orbit to one year.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1700	The JPSS Ground System shall control ground system resources to ensure their availability when required for JPSS-managed and supported missions.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-393	The JPSS Ground System shall ensure operations have complete and timely situational awareness of all JPSS Ground System resources.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-1699	The JPSS Ground System shall validate ground commands prior to their execution.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-134	The JPSS Ground System shall display system status to operators in near real-time.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-303	The JPSS Ground System shall generate data metrics for all data processed.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-304	The JPSS Ground System shall generate data accounting metrics for all received data.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-305	The JPSS Ground System shall generate data accounting metrics for all delivered data.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-1731	The JPSS Ground System shall be capable of transmitting data via the SN/WSC to the JPSS satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0	Test	NA
GSR-3265	The JPSS Ground System shall be capable of receiving data from the JPSS satellites via SN/WSC.	Functional	S-NPP JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0	Test	NA
GSR-306	The JPSS Ground System shall monitor communications network operation.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-133	The JPSS Ground System shall monitor services provided by external entities.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-73	The JPSS Ground System shall manage Mission Support Data.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS GRAVITE	2.0.0	5.0.0	Test	NA
GSR-139	The JPSS Ground System shall log operations activities for each service provided including scheduled activity preparation, execution and performance.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Test	NA
GSR-1710	The JPSS Ground System shall predict Radio Frequency Interference (RFI) events between JPSS-managed satellites and known other satellite systems.	Functional	S-NPP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0	Demonstration	NA
GSR-81	The JPSS Ground System shall perform Mission Planning and Scheduling for the JPSS Program.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	Test
GSR-644	The JPSS Ground System shall schedule sensor Calibration/Validation activities.	Functional	S-NPP JPSS-1 JPSS-2	CGS Algorithm Provider	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-83	The JPSS Ground System shall coordinate with external programs to perform the Mission Planning and Scheduling of JPSS resources.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS KSAT Ground Project	2.0.0	5.0.0	Demonstration	NA
GSR-88	The JPSS Ground System shall maintain a JPSS master schedule.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-137	The JPSS Ground System shall generate schedules detailing the configuration of assets necessary to provide services.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-102	The JPSS Ground System shall store all data transmitted to JPSS-managed satellites for the life of the program.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-112	The JPSS Ground System shall centrally archive all operations data for the life of the program.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-49	The JPSS Ground System shall ingest stored mission data from JPSS SMD Hub.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3398	The JPSS Ground System shall support instruments with configurable data rates as defined in the JPSS-1 MDFCB (472-00251).	Functional	JPSS-1	FVTS Algorithm Provider	2.0.0	5.0.0	Test	NA
GSR-3399	The JPSS Ground System shall support instruments with configurable data rates defined in the NPP MDFCB (429-05-02-42).	Functional	S-NPP	Algorithm Provider	2.0.0	5.0.0	Test	NA
GSR-3400	The JPSS Ground System shall implement decompression for all compressed instrument data received from the satellite.	Functional	S-NPP JPSS-1	CGS	2.0.0	5.0.0	Test	NA
GSR-3401	The JPSS Ground System shall support multiple APIDs from a given instrument in support of lossless data compression or uncompressed data coming from a given instrument.	Functional	S-NPP JPSS-1	CGS FVTS	2.0.0	5.0.0	Test	NA
GSR-2320	The JPSS Ground System shall produce an EDR from the available data.	Functional Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3354	The JPSS Ground System shall be configurable to select either official or alternate ancillary data for the generation of data products.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-113	The JPSS Ground System shall provide capacity for on-line storage of all science product related data storage for a minimum of seven days.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-335	The JPSS Ground System shall format data products in accordance with the JPSS Algorithm Specification Volume II: Data Dictionary (474-00448-02-01 through 474-00448-02-30).	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-1197	The JPSS Ground System shall produce RDRs for GCOM W-1 in accordance with the GSRD Volume 2.	Functional	GCOM-W1	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3156	In support of graceful degradation, the JPSS Ground System shall be capable of generating data products that may not meet specified algorithm performance requirements.	Functional	S-NPP JPSS-1 JPSS-2	CGS Algorithm Provider	2.0.0	5.0.0	Inspection	NA
GSR-19	The JPSS Ground System shall produce data products for S-NPP in accordance with the GSRD Volume 2.	Functional	S-NPP	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3236	The JPSS Ground System shall produce data products for JPSS satellites in accordance with the GSRD Volume 2.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA
GSR-3209	JPSS Ground System shall produce data products per GSRD Volume 2 from all secondary operational sensors on JPSS-managed satellites concurrently.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1737	The JPSS Ground System shall ensure that the recovery of missed data shall not impact the delivery of data that can still meet EDR latency requirements.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-1747	The JPSS Ground System shall produce a quality flag to indicate the application and identity of a degradation condition to a retrieved value in a data record.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-1750	The JPSS Ground System shall produce a quality flag to indicate the application and identity of an exclusion condition to a retrieved value in a data record.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-1736	In a missed pass scenario, the JPSS Ground System shall recover data on subsequent passes.	Functional	S-NPP JPSS-1	CGS	2.0.0	5.0.0	Test	NA
GSR-1240	The JPSS Ground System shall deliver data products including all xDR associated descriptive information (e.g., metadata) to CLASS for long term storage.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-3200	The JPSS Ground System shall deliver RDRs and Metadata to the Science Data Segment (SDS).	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3170	The JPSS Ground System shall deliver data products to the NESDIS ESPC.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3172	The JPSS Ground System shall make available SMD APs to the FNMOC.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3173	The JPSS Ground System shall make available SMD APs to the NAVOCEANO.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-3239	The JPSS Ground System shall be configurable to make data products available to authorized users.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-673	The JPSS Ground System shall provide a process for recovery of damaged or missing SMD data from JPSS-managed assets.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-1654	The JPSS Ground System shall provide data quality monitoring capability at the NSOF.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE SPS	2.0.0	5.0.0	Inspection	NA
GSR-828	The JPSS Ground System shall develop and maintain a simulation capability consisting of a high fidelity authentic simulation of the spacecraft, instruments, and ground system.	Functional	S-NPP JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1605	The JPSS Ground System shall be capable of simulating command and control of three satellites simultaneously.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Demonstration	NA
GSR-1199	The JPSS Ground System simulation capability shall support validation of the Flight Products.	Functional	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1200	The JPSS Ground System simulation capability shall support verification and validation of the JPSS Ground System.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1201	The JPSS Ground System simulation capability shall support JPSS pre- and post-launch operations (Launch minus 12 months through decommissioning) and Mission Availability over the mission lifetime.	Functional	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1202	The JPSS Ground System simulation capability shall execute the Flight Software (Spacecraft and Instruments) and the Ground Software.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1203	The JPSS Ground System simulation capability shall exhibit real-time response behavior with respect to operation of the JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1212	The JPSS Ground System simulation capability shall support operator training and certification.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1213	The JPSS Ground System simulation capability shall support anomaly investigation.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Inspection	NA
GSR-156	The JPSS Ground System shall provide access to spacecraft simulators for all authorized mission users.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0	Inspection	NA
GSR-1214	The JPSS Ground System simulation capability shall be configurable by operations personnel.	Functional	JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1215	The JPSS Ground System simulation capability shall be re-configured to a new state within two hours.	Functional	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0	Inspection	NA
GSR-642	The JPSS Ground System shall monitor and report sensor performance in terms of calibration/validation metrics.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-1227	The JPSS Ground System shall validate Algorithm/Table Change Packages for operational algorithms.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-643	The JPSS Ground System shall monitor data products and reports in accordance with the GSRD Volume 2.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-645	The JPSS Ground System shall verify algorithm and table updates.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE SPS	2.0.0	5.0.0	Inspection	NA
GSR-648	The JPSS Ground System shall produce flight system calibration data updates.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-649	The JPSS Ground System shall produce ground system calibration data updates.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Inspection	NA
GSR-651	The JPSS Ground System shall generate State of Health data for the Cal/Val node.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Demonstration	NA
GSR-652	The JPSS Ground System shall provide the infrastructure necessary to perform calibration and validation.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-334	The JPSS Ground System shall provide a library for Field Terminal related specifications for access by Field Terminal Users.	Functional	S-NPP JPSS-1 JPSS-2	FTS	2.0.0	5.0.0	Inspection	NA
GSR-2319	The JPSS Ground System shall make available to the Field Terminal User Community ground processing software and algorithms to enable Field Terminal Users to process direct broadcast data.	Functional	S-NPP JPSS-1 JPSS-2	FTS	2.0.0	5.0.0	Inspection	NA
GSR-1175	The JPSS Ground System shall monitor the HRD Direct Broadcast from JPSS-managed satellites for a minimum of 3 times per day per satellite.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-3201	The JPSS Ground System shall provide backup ground system capabilities including command, control and data processing in support of Continuity of Operations (COOP) at the Consolidated Backup (CBU) facility in Fairmont, WV.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS AGS	2.0.0	5.0.0	Test	NA
GSR-400	The JPSS Ground System shall maintain an alternate Management and Operations Node that is functionally identical to the primary Management and Operations node as part of the CBU.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS AGS	2.0.0	5.0.0	Demonstration	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-3202	The Alternate Data Processing Node (DPN) of the JPSS Ground System shall deliver data to the CLASS Point of Presence (PoP) at CBU.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3203	The Alternate Data Processing Node (DPN) of the JPSS Ground System shall deliver data to the NESDIS ESPC – NDE Point of Presence (PoP) at CBU.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3205	The JPSS Ground System shall provide SMD APs to FNMOC Point of Presence at the CBU.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-3206	The JPSS Ground System shall provide SMD APs to NAVOCEANO Point of Presence at the CBU.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-1221	The JPSS Ground System shall deploy an alternate Data Processing Node (DPN) with the same capabilities as the primary DPN, as part of the CBU capability to fulfill Continuity of Operations (COOP).	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Demonstration	NA
GSR-402	The JPSS Ground System shall transition full operations between the COOP and primary facilities in less than 12 hours.	Performance	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS AGS	2.0.0	5.0.0	Inspection	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1682	The JPSS Ground System shall provide for configurable data synchronization between the primary and alternate locations.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS AGS	2.0.0	5.0.0	Test	NA
GSR-1683	The JPSS Ground System alternate Management and Operations Node shall be capable of being remotely configurable from the primary Management and Operations Node.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Test	NA
GSR-1684	The JPSS Ground System alternate Data Processing Node shall be capable of being remotely configurable from the primary Data Processing Node.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-1685	The JPSS Ground System alternate Management and Operations Node shall be capable of being remotely operable from the primary Management and Operations Node.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Test	NA
GSR-1686	The JPSS Ground System alternate Data Processing Node shall be capable of being remotely-operable from the primary Data Processing Node.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA

Req ID	Requirement Text	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM
GSR-1687	The JPSS Ground System shall have timely ancillary data at the alternate DPN during COOP conditions.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0	Test	NA
GSR-403	The JPSS Ground System shall support operations out of the COOP facility for at least 30 consecutive days during each COOP event.	Functional Performance	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0	Analysis Demonstration	NA
GSR-682	The JPSS Ground System shall meet security requirements per NIST 800-53 in accordance with the JPSS Ground System Security Requirements Document (470-00094).	Security	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0	Analysis Inspection	NA

Appendix B. JPSS-1 Mission Requirements

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-795	JPSS Missions	The JPSS Ground System shall provide concurrency of operations.	The Ground System must support multiple missions concurrently which include: S-NPP, DMSP, Metop, Coriolis/WindSat, GCOM-W1, JPSS-1, JPSS-2, SCaN, and NSF. FVTS, FTS, AGS and GRAVITE are only required to support S-NPP, JPSS-1 and JPSS-2.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE KSAT AGS	2.0.0	5.0.0
GSR-71	Fleet Ground Management	The JPSS Ground System shall manage JPSS satellites as an integrated fleet.	The JPSS Ground System must be designed to efficiently schedule, configure, monitor and assess JPSS-managed satellites from an integrated and adaptable ground system architecture. Console positions and operator activities must be seamlessly configurable in order to focus in on any one satellite.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-302	Fleet Ground Management	The JPSS Ground System shall generate State of Health (SOH) data for all JPSS Ground System functional nodes.	All functions of the JPSS Ground System must provide real-time monitoring of the State of Health. After collecting status information, it must be compared with associated limits to generate state of health indications for each asset to ensure optimal performance. Ground operations will perform necessary functions on this data. FTS provides the HRD monitor which must generate SOH information.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS GRAVITE AGS	2.0.0	5.0.0
GSR-395	Fleet Ground Management	The JPSS Ground System shall ensure operations have complete and timely reporting on scheduled activity preparation, execution and performance.	This is State of Services. JPSS operations are performed by way of scheduled mission specific and general JPSS operations activities deployed to JPSS locations and resources. A key aspect of situational awareness is confirming the activities and related resource configurations are prepared in advance, execute the activity as planned, and report on the general performance of the activity. Timeliness will be defined in the level 3 requirements.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS KSAT AGS	2.0.0	5.0.0

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GSR-396	Fleet Ground Management	The JPSS Ground System shall ensure operations have complete and timely reporting on faults within the JPSS-managed flight/ground resources.	Operations must be notified of faults occurring anywhere within JPSS-managed resources to support operational availability.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE	2.0.0	5.0.0
GSR-397	Fleet Ground Management	The JPSS Ground System shall ensure operations have complete and timely reporting on JPSS-managed Flight/Ground resources experiencing degraded capacity.	In order to ensure JPSS operational availability, data availability and data quality operations must be notified of reduced capacity from nominal levels occurring anywhere within JPSS-managed resources. This includes maintenance, environmental, and upgrade activities.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE	2.0.0	5.0.0
GSR-126	Fleet Ground Management	The JPSS Ground System shall provide JPSS operators with an integrated set of displays that provide global situational awareness for all JPSS-managed flight/ground assets.	Integrated operational global situational awareness for space and ground JPSS-managed resources is imperative. The separation of space and ground asset status has been a cause of problems in the past.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS KSAT	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-107	Fleet Ground Management	The JPSS Ground System shall provide automated control of JPSS operational resources.	Automated control can occur when the response time for the expected scheduled service traffic cannot be reliably supported by manual operations. In addition, automated control may occur to allow for execution of sequences when violations of thresholds occur. Any automated control capability must have a manual override. Automated control is necessary for all resources involved with data production, from downlink to final products. However, automated control is not required for test and training.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-108	Fleet Ground Management	The JPSS Ground System shall provide manual control of JPSS operational resources.	Although automated processes can improve efficiency and reliability of execution, when automated systems fail the operators must have the ability to reconfigure components to establish service even if those methods are not preferred for normal operations. This includes manual control for both space and ground components.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-1558	Space Asset Protection	For nominal operations, the JPSS Ground System shall encrypt the commands to the JPSS-managed satellites using a NIST FIPS 140-2 certified AES algorithm uplink security system that uses 256 bit keys.	GPD 7120.1A (GSFC Space Asset Protection Policy) establishes the policy for the protection of GSFC-managed space missions. The command link design should not be susceptible to contact from sources other than the JPSS mission operations control centers.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-252	Space Asset Protection	The JPSS Ground System shall ensure all flight commands for JPSS-managed satellites have been authenticated prior to execution.	GPD 7120.1A (GSFC Space Asset Protection Policy) establishes the policy for the protection of GSFC-managed space missions.	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0
GSR-466	JPSS Ground System Design	The JPSS Ground System shall have an operational life through at least FY 2025.	The overall design and architecture must support periodic technical refreshes and upgrades to ensure an operational life through at least FY 2025 can be met.	Non-Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	Ground Project	2.0.0	5.0.0
GSR-830	Independent Development and Test Capability	The JPSS Ground System shall control data flows between the operational environment and other environments.	There may be times when data must be transferred from the operational environment to another environment (e.g., training) or from another environment to the operational environment (e.g., software patch). The controls for allowing those transfers must be both physical and procedural.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 NSF	CGS FVTS GRAVITE	2.0.0	5.0.0

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GSR-831	Independent Development and Test Capability	The JPSS Ground System shall provide the functionality to perform simulations, integration and testing without impact to operations.	The JPSS Ground System is required to operate for 12 years. Development and integration and test activities cannot interrupt operations. Consequently those activities, which are required for system evolution and maintenance, must be performed during non-operational periods or on independent functional capabilities isolated from the operational systems. This also applies to algorithm development and maintenance.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 NSF	CGS FVTS GRAVITE	2.0.0	5.0.0
GSR-3260	Units, Formats and Standards	The JPSS Ground System shall utilize a reliable transmission protocol.	The system must use a reliable protocol to ensure SMD delivery. Not applicable to space/ground link where the transmission protocols are controlled by the flight project.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0
GSR-149	Units, Formats and Standards	The JPSS Ground System shall use WGS 84 as the geodetic system in accordance with the Department of Defense World Geodetic System 1984 Technical Report, (NIMA TR-8350.2).	WGS-84 has been designated the geodetic reference system for the JPSS Ground System.	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS GRAVITE	2.0.0	5.0.0

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GSR-292	Units, Formats and Standards	The JPSS Ground System shall employ a system time convention based on the US Naval Observatory (USNO) definition of Coordinated Universal Time [UTC (USNO)] in accordance with the ITU-R TF.460-6, Standard-frequency and time-signal emissions including the leap second convention.	UTC is the time format distributed and utilized worldwide and can be readily obtained from the Global Positioning Satellites (GPS).	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0
GSR-293	Units, Formats and Standards	The JPSS Ground System on-orbit coordinate system shall use a right-hand, orthogonal, body-fixed XYZ coordinate system as follows: the +Z axis is downward towards nadir, the Y-axis is along the orbit normal plane (+Y is opposite the orbital angular momentum), and the X-axis is along the spacecraft velocity vector (+X toward the direction of spacecraft travel).	A common reference frame is necessary to ensure compatibility with heritage coordinate systems (e.g. S-NPP) for Earth-observing spacecraft.	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS GRAVITE	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-294	Units, Formats and Standards	The JPSS Ground System shall be IPV6 capable.	IPV6 is the current standard for Internet Protocols and the ground system must be current with accepted industry practices when possible. Standards for Internet Protocol routing are defined in accordance with IETF RFC 2460 - Internet Protocol. IPv6 compatibility is required in accordance with US Executive Order 893, effective June 2010. Applies to everything that does not go through the NOAA Trusted Internet Connection (TIC).	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE	2.0.0	5.0.0
GSR-295	Units, Formats and Standards	The JPSS Ground System shall use the Earth-centered J2000 inertial coordinate system for attitude knowledge and orbit reference.	Reference frame knowledge is required for accurate data location and processing.	Functional	S-NPP JPSS-1 JPSS-2	CGS FVTS GRAVITE AGS	2.0.0	5.0.0

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GSR-296	Units, Formats and Standards	The JPSS ground system shall exclusively use lossless data compression techniques when data must be compressed.	The resolution of data must not be degraded from the resolution it is acquired from a spacecraft. If compression is used, it must be a lossless process; i.e. RLL encoding is acceptable for images while JPEG compression is not acceptable. This does not include the use of imaging or video compression for higher level weather and climate data products.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-3213	Units, Formats and Standards	The JPSS Ground System shall implement the CCSDS Space Link Extension in accordance with the following CCSDS SLE Return Service and Forward Service Specifications: A. Return All Frames Service Specification B. Return Channel Frames Service Specification C. Forward CLTU Service Specification	Use of the CCSDS standards ensures uniformity at the numerous ground stations and precludes the need to provide mission-specific hardware at each ground station location.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0
GSR-1692	Units, Formats and Standards	The JPSS Ground System shall use the metric system of measurement as required by NPD 7120.4D, NASA Engineering and Program/Project Management Policy.	NASA policy mandates the use of the metric system. Waivers may be required for heritage systems.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS GRAVITE AGS Algorithm Provider	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3307	Ground System Performance	The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to FNMOC Point of Presence measured over a 30-day period.	Raw Data Availability (RDA) is defined as the number of Application Packets (APs) provided to FNMOC versus the number of expected APs minus exceptions. The number of expected APs is what stored on the SSR. The exceptions include APs not requested by FNMOC or not delivered due to interface outages for which FNMOC is responsible.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3308	Ground System Performance	The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to NAVOCEANO Point of Presence measured over a 30-day period.	Raw Data Availability (RDA) is defined as the number of Application Packets (APs) provided to NAVOCEANO versus the number of expected APs minus exceptions. The number of expected APs is what stored on the SSR. The exceptions include APs not requested by NAVOCEANO or not delivered due to interface outages for which NAVOCEANO is responsible.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-1246	Ground System Performance	The JPSS Ground System shall provide at least 99% of the SMD captured on the SSR to the Comprehensive Large Array-data Stewardship System (CLASS) measured over a 30-day period.	Raw Data Availability (RDA) is defined as the number of Application Packets (APs) contained in the RDRs provided to CLASS versus the number of expected APs minus exceptions. The number of expected APs is what stored on the SSR for the RDR production. The exceptions include APs not requested by CLASS or not delivered due to interface outages for which CLASS is responsible.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3383	Ground System Performance	The JPSS Ground System shall provide at least 99% of all deliverable products to the Comprehensive Large Array-data Stewardship System (CLASS) measured over a 30-day period.	Product Data Availability (APD) is defined as the number of data products provided to CLASS versus the number of expected deliverable products minus exceptions. The expected products include granule-based xDRs that should be generated from the APs stored on the SSR, deliverable IPs, ancillary and auxiliary data. The exceptions include products not requested by CLASS or not provided due to interface outages for which CLASS is responsible.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3384	Ground System Performance	The JPSS Ground System shall provide at least 99% of all deliverable products to ESPC measured over a 30-day period.	Product Data Availability (APD) is defined as the number of data products provided to ESPC versus the number of expected products minus exceptions. The expected products include granule-based xDRs that should be generated from the APs stored on the SSR, deliverable IPs, ancillary and auxiliary data. The exceptions include products not requested by ESPC or not provided due to interface outages for which ESPC is responsible.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3385	Ground System Performance	The JPSS Ground System shall provide at least 99% of all deliverable products to SDS measured over a 30-day period.	Product Data Availability (APD) is defined as the number of data products provided to SDS versus the number of expected products minus exceptions. The expected products include granule-based xDRs that should be generated from the APs stored on the SSR, deliverable IPs, ancillary and auxiliary data. The exceptions include products not requested by SDS or not provided due to interface outages for which SDS is responsible.	Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3310	Ground System Performance	The JPSS Ground System shall make APs from JPSS-1/JPSS-2 available to the user's Point of Presence within 70 minutes of the observation time for at least 95% of the APs intended for that user measured over a 30-day period.	Latency is measured from the observation time of the packet to the timestamp of the acknowledgement of successful delivery of the packet to user's landing zone. Assumes that AP deliveries are file-based and not filtered. Note that user's PoP is local at NSOF and CBU and JPSS does not provide the network. The JPSS AP users include FNMOC and NAVOCEANO. The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired APs provided on late requests and late deliveries due to interface outages for which the user is responsible.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-1422	Ground System Performance	The JPSS Ground System shall make JPSS EDRs available at the JPSS GS interface for each official external mission data consumer within 80 minutes of the observation time for at least 95% of the EDRs generated over a 30-day period.	Latency is measured from the observation time of the latest sensor data used in the creation of the EDR to the timestamp of the acknowledgement of successful delivery of the EDR to the user's landing zone. The 95% is an aggregate of all EDRs defined as the primary operational set of data products. Products are defined in the GSRD Volume 2. Official external mission data consumers (users) include the NESDIS ESPC, CLASS, SDS, and GRAVITE. The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay. The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the user is responsible.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3391	Ground System Performance	The JPSS Ground System shall provide at least 99% of all requested deliverable products to GRAVITE measured over a 30-day period.	Product Data Availability is defined as the number of data products provided to GRAVITE vs. the number of expected deliverable products minus exceptions. The expected products include MSD produced by or made available to CGS, deliverable IPs, and granule-based xDRs that should be generated from the APs stored on the SSR. The exceptions include products not requested by GRAVITE or not provided due to interface outages for which GRAVITE is responsible. This requirement is applicable per the following deliverable product categories: RDR, SDR, TDR, EDR, IP, and MSD.	Performance	S-NPP JPSS-1 JPSS-2		2.0.0	3.0.0
GSR-1243	Ground System Performance	The JPSS Ground System shall meet an operational availability (Ao) of 99% measured over a 30-day period.	99% is the operational availability requirement for the JPSS Ground System. Each node of the ground system is allocated an individual Ao reflecting the total number of missions being supported.	Performance	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-1306	Ground System Performance	The JPSS Ground System's Ground Network Node shall provide WAN services with a 99.9% Ao measured over a 30-day period.	This node is required continuously (i.e., 24/7) to support operations. Availability of the node encompasses availability of interfaces associated with this node.	Performance	S-NPP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1307	Ground System Performance	The JPSS Ground System Management and Operations Node shall have an operational availability (Ao) of 99.9% measured over a 30-day period.	This node is required continuously (i.e., 24/7) to support operations. Availability of the node encompasses availability of interfaces associated with this node.	Performance	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 NSF	CGS AGS	2.0.0	5.0.0
GSR-1308	Ground System Performance	The JPSS Ground System Data Processing Node shall have an operational availability (Ao) of 99.9% measured over a 30-day period.	This node is required continuously (i.e., 24/7) to support operations. Availability of the node encompasses availability of interfaces associated with this node.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS NAB	2.0.0	5.0.0
GSR-1309	Ground System Performance	The JPSS Ground System Simulation Node shall have an operational availability (Ao) of 95% measured over a 30-day period.	This node is utilized periodically during operations and is not required 24/7, therefore, the availability threshold has been reduced to 95% measured over a 30-day period. Availability of the node encompasses availability of interfaces associated with this node.	Performance	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-1310	Ground System Performance	The JPSS Ground System Calibration/Validation Node shall have an operational availability (Ao) of 95% measured over a 30-day period.	This node is utilized periodically during operations and is not required 24/7, therefore, the availability threshold has been reduced to 95% measured over a 30-day period. Availability of the node encompasses availability of interfaces associated with this node.	Performance	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0
GSR-1311	Ground System Performance	The JPSS Ground System Field Terminal Support Node shall have an operational availability (Ao) of 95% measured over a 30-day period.	The Field Terminal Support Node provides User Support, Software and Algorithm Support, and Direct Broadcast Quality Monitoring. Key to the support provided is a Web Portal which is where all data and products such as Software and Algorithm updates, Broadcast Data Quality Monitoring Reports, Mission Notices, Mission Schedules, etc., are placed for the Field Terminal Users to retrieve. Since those users can be scattered around the world, the Web Portal must be available 24.x7. Ao only applies to the Web Portal function.	Performance	S-NPP JPSS-1 JPSS-2	FTS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-1238	Ground System Performance	The JPSS Ground System shall incorporate 99.9% of the RDRs meeting processing thresholds in the production of SDRs, TDRs, and EDRs at the NESDIS Data Processing Node measured over a 30-day period.	The JPSS Ground System must ensure the completeness of the data products that are produced and subsequently archived. Does not include RDRs that are under the data processing thresholds (due to fill data, etc.) and are not used for downstream processing.	Performance	S-NPP JPSS-1 JPSS-2	CGS SPS	2.0.0	5.0.0
GSR-1239	Ground System Performance	The JPSS Ground System shall generate RDRs from all non-fill Application Packets.	The JPSS Ground System must ensure that all non-fill APs are processed to RDRs and provided to CLASS for archival storage.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3371	Ground System Performance	The JPSS Ground System shall produce SDRs within 80 minutes of the observation time of the latest sensor data used in the creation of an SDR for at least 95% of the SDRs generated over a 30-day period.	Not all users will get EDRs, therefore there is a need for latency for SDRs. Latency is measured from the observation time of the latest sensor data used in the creation of the SDR to the timestamp of the acknowledgement of successful delivery of the SDR to the user's landing zone. The 95% is an aggregate of all SDRs defined as the primary operational set of data products. Products are defined in the GSRD Volume 2. The users for JPSS SDRs include ESPC, CLASS, SDS, and GRAVITE. The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay. The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3372	Ground System Performance	The JPSS Ground System shall produce TDRs within 80 minutes of the observation time of the latest sensor data used in the creation of a TDR for at least 95% of the TDRs generated over a 30-day period.	Not all users will get EDRs, therefore there is a need for latency for TDRs. Latency is measured from the observation time of the latest sensor data used in the creation of the TDR to the timestamp of the acknowledgement of successful delivery to the user's landing zone. The 95% is an aggregate of all TDRs defined as the primary operational set of data products. Products are defined in GSRD Volume 2. The users for JPSS TDRs include ESPC, CLASS, SDS, and GRAVITE. The latencies for the delivery requests that are aggregated are calculated from the last packet in the last product contained within the aggregated set. The latency does not include the associated subscription delay. The percentage should be calculated as the number of products provided within the required time vs. the total provided products minus the exceptions. The total provided products include the products provided within the required time and the ones beyond the required time. The exceptions include repaired products, products provided on late requests (including resumed suspended requests for the time period it is suspended), and late deliveries due to interface outages for which the user is responsible.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-3373	Ground System Performance	The JPSS Ground System shall produce JPSS RDRs within 70 minutes of observation time of the latest sensor data used in the creation of an RDR for at least 95% of the RDRs generated over a 30-day period.	This requirement is derived as a sub-allocation of EDR latency. Latency is measured from the observation time of the latest sensor data used in the creation of the RDR to the timestamp of the acknowledgement of successful delivery of the RDR to the user's landing zone. The 95% is an aggregate of all RDRs.	Performance	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1663	Ground System Performance	The JPSS Ground System shall provide data communications service between the JPSS interface at the Svalbard Ground Station and the JPSS interface in the Continental U.S. (CONUS) that has an availability of no less than 99.95% averaged over a 30-day period.	Establishes the uptime for data communication services.	Performance	S-NPP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN	CGS	2.0.0	5.0.0
GSR-311	Ground System Capacity and Scalability	The JPSS Ground System shall include data processing capacity to process retransmitted data concurrently while processing current operational data.	In the event of a communications outage, the Ground System must have margin to continue current operations while processing retransmitted data. Recovery processing of up to 24 hours of missed data must be completed within 5 days after retrieval.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-312	Ground System Capacity and Scalability	The JPSS Ground System shall include data communication capacity to retransmit data concurrently with transmission of current operational data.	In the event of a communications outage, the Ground System must have communications channel capacity to continue current operations while retransmitting data delayed due to a communications outage. The time to retransmit data should not exceed the duration of the communications outage; i.e., if a ground station link is inoperative for 24 hours, any delayed data should be retransmitted within 24 hours while continuing normal operations.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-164	Ground System Capacity and Scalability	The JPSS Ground System shall include resources to perform maintenance without impact to operational services.	The JPSS Ground System must include facilities for hardware and software maintenance, for use during nominal operations. This would allow configuration, analysis, testing and deployment of hardware and software, upgrades and new capabilities without impact to ongoing operations.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS	2.0.0	5.0.0

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GSR-168	Ground System Capacity and Scalability	The JPSS Ground System shall include resources to conduct training activities without impact to operational services.	All ancillary operations of the JPSS Ground System must be conducted without impact to normal operations. Training includes operator training, user training and training for maintenance personnel.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-309	Ground System Capacity and Scalability	The JPSS Ground System shall have sufficient resources to perform commissioning of one JPSS-managed spacecraft while not impacting the simultaneous performance of ongoing operations.	The JPSS Ground System must include resources, facilities, and capacity to complete on orbit checkout without impact to ongoing operations.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE AGS	2.0.0	5.0.0
GSR-310	Ground System Capacity and Scalability	The JPSS Ground System shall have capacity to complete on-orbit calibration and validation of satellite following launch without impact to ongoing operations.	Level-1 program requirements specify the time frame for calibration/validation hence the Ground System must include capacity to perform this function without impact to ongoing operations.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE AGS	2.0.0	5.0.0
GSR-3211	Ground System Capacity and Scalability	The JPSS Ground System shall be scalable such that the services being provided can be extended to include up to seven JPSS-managed missions, five Data Processing Services missions and seven Data Acquisition and Routing missions.	The JPSS Ground System needs to concurrently support existing operational missions while being scalable to support additional missions with different service needs.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0

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GSR-3229	Ground System Capacity and Scalability	The JPSS Ground System shall provide a minimum operational margin of 50% for the Data Processing Node throughout.	Operational margin describes deployed capacity for limited growth during operations.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3230	Ground System Capacity and Scalability	The JPSS Ground System shall provide a minimum operational margin of 25% for the Space/Ground Communications Node, Management and Operations Node, and Data Processing Node storage.	Operational margin describes deployed capacity for limited growth during operations.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3231	Ground System Capacity and Scalability	The JPSS Ground System shall provide a minimum operational margin of 20% for Management and Operations Node peak total CPU capacity.	Operational margin describes deployed capacity for limited growth during operations.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3232	Ground System Capacity and Scalability	The JPSS Ground System shall provide a minimum operational margin of 20% for Management and Operations Node peak total memory capacity.	Operational margin describes deployed capacity for limited growth during operations.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-162	Training Support	The JPSS Ground System shall provide a training environment that mimics the operational environment.	The JPSS Ground System must include an environment for training operators which provide comprehensive operator training. Training must cover nominal and emergency situations including failover to backup systems. Training capabilities need to be capable of 'test-like-you-fly" fidelity, and represent real-life operational situations.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS	2.0.0	5.0.0
GSR-200	Training Support	The JPSS Ground System training environment shall be configurable without software releases or code changes (i.e., data driven).	The training environment should be completely data/script driven, and only requiring a major upgrade with the addition of a new service, mission or major resource (new facility, etc.).	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS	2.0.0	5.0.0
GSR-196	Maintenance	When transitioning JPSS Ground System resources to a new release for operations, the JPSS Ground System shall revert to the prior operational configuration within five minutes of being commanded in case of anomalies with the new capabilities.	All transitions of operation from a current set of resources to a new set (e.g., new software, new hardware, new strings of equipment, additional resources to extend capacity, etc.) should be performed in a manner that allows for rapid fall back to the previous operational state in the event an anomaly with the new resources is encountered.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0

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GSR-3375	Maintenance	The JPSS Ground System shall transition operations between the primary operating environment and the secondary operating environment within five minutes of initiation.	This will limit the time the JPSS Ground System will be in a transient state and minimize impacts to the operational robustness, availability, fault tolerance or performance of the JPSS Ground System. Either the primary or secondary system environment may be designated as the operational system for a period of time. This requirement can apply to the MON only, the DPN only, or both the MON and DPN.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-1712	Maintenance	The JPSS Ground System shall provide a library of configuration-managed artifacts for the operational JPSS System.	The configuration-managed artifacts include documentation, baseline algorithm code, processing coefficient tables, and look-up tables.	Non-Functional	S-NPP JPSS-1 JPSS-2	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0
GSR-3564	Interfaces	The JPSS Ground System shall comply with the Joint Polar Satellite System (JPSS) Government Resource for Algorithm Verification, Integration, Test and Evaluation (GRAVITE) to STAR Central Data Repository (SCDR) Interface Requirement Document (IRD) (474-00990).	GRAVITE must interface to the STAR system for the exchange of data.	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0

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GSR-3214	Interfaces	The JPSS Ground System shall interface with the Attitude Ground System in accordance with the JPSS CGS to AGS IRD (474-00316).	Defines the Interface requirements supporting the ground based assessment of satellite attitude and derivation of attitude sensor coefficients.	Interface	S-NPP JPSS-1 JPSS-2	CGS AGS	2.0.0	5.0.0
GSR-2	Interfaces	The JPSS Ground System shall interface with the NESDIS ESPC in accordance with the JPSS GS to NESDIS ESPC IRD (474-00303).	The NESDIS ESPC is a primary customer for JPSS Ground System generated observational products and associated by-products (e.g., metadata, intermediary products, mission alerts, etc.). NESDIS is responsible for the collection, archiving, and dissemination of the environmental data collected by a variety of in situ and remote sensing observing systems operated by NOAA.	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS NAB	2.0.0	5.0.0
GSR-3	Interfaces	The JPSS Ground System shall interface with CLASS in accordance with the JPSS GS to CLASS IRD (474-00302).	JPSS observational data, products, by-products, installed code and configuration data are to be sent to CLASS (as opposed to developing a separate repository) for archival storage. The CLASS is NOAA's enterprise-wide information technology system designed to support long-term, secure preservation and standards-based access to environmental data collections and information.	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0

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GSR-10	Interfaces	The JPSS Ground System shall interface with the NASA SDS in accordance with the JPSS GS to NASA SDS IRD (474-00304).	The SDS provides the capabilities to assess and verify the climate quality of observational products. The SDS receives data from several external systems including JPSS CGS, NOAA's Comprehensive Large Array-data Stewardship System (CLASS), and Casa NOAA Observing System Architecture (CasaNOSA), in order to evaluate data with respect to climate research.	Interface	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-203	Interfaces	The JPSS Ground System shall interface with the Naval Oceanographic Office in accordance with the JPSS GS to NAVOCEANO IRD (474-00315).	Naval Oceanographic Office (NAVOCEANO) acquires and analyzes global ocean and littoral data to provide specialized, operationally significant products and services for war fighters and civilian, national and international customers. These products and services support virtually every type of Fleet operation by providing mission essential information to the war fighter 24 hours a day, seven days a week.	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-204	Interfaces	The JPSS Ground System shall interface with the Fleet Numerical Meteorology and Oceanography Center (FNMOC) as defined in the JPSS GS to FNMOC IRD (474-00314).	Fleet Numerical Meteorology and Oceanography Center (FNMOC) is the Department of Defense's (DoD) primary central production site for worldwide computer-generated operational meteorological and oceanographic analysis and forecast products. Fleet Numerical Meteorology and Oceanography Center (FNMOC) is one of a half dozen internationally recognized operational weather centers and the world's leader in global oceanographic and coupled air-ocean forecasting.	Interface	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-221	Interfaces	The JPSS Ground System shall interface with the NOAA/NESDIS FCDAS for JPSS-managed satellites in accordance with the JPSS GS to NESDIS FCDAS IRD (474-00305).	FCDAS is the backup Ground Station for the S-NPP TT&C and SMD RF link services. JPSS must maintain interfaces to the S-NPP satellite until S-NPP is decommissioned.	Interface	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-2322	Interfaces	The JPSS Ground System shall comply with the JPSS CGS to FVTS IRD (474-00222).	The JPSS Ground System must have a simulation node. The CGS must interface to the Simulation node.	Interface	S-NPP JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0
GSR-2323	Interfaces	The JPSS Ground System shall comply with the JPSS CGS to GRAVITE IRD (474-00200).	The CGS must interface to the Cal/VAL node for calibration, validation and algorithms.	Interface	S-NPP JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0

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GSR-1559	RF Link Interfaces	The JPSS Ground System shall interface with the JPSS Satellite TT&C S-band RF links in accordance with the IRD for RF Interfaces To and From JPSS Satellites (472-00173).	This document specifies the TT&C interface between the space segment and the Ground System for JPSS.	Interface	JPSS-1	CGS KSAT	2.0.0	5.0.0
GSR-3264	RF Link Interfaces	The JPSS Ground System shall interface with the JPSS Satellite Stored Mission Data (SMD) Ka-band RF link in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).	This document specifies the SMD interface between the space segment and the Ground System for JPSS.	Interface	JPSS-1	CGS KSAT	2.0.0	5.0.0
GSR-233	RF Link Interfaces	The JPSS Ground System shall interface with White Sands in accordance with the Network Requirements Document for JPSS-1 (474-REF-00803) and the SN to JPSS C3S ICD (474-REF-00651).	The Space Network provides full orbit coverage to JPSS-1 and will be relied upon during the initial phases of launch and orbital insertion. The SN will also provide back-up TT&C capabilities for mission critical events (e.g., on-orbit activation, orbit maintenance maneuvers) and contingency events (e.g., lost connections to ground stations). SN will also provide a backup SMD capability for JPSS-1.	Interface	JPSS-1	CGS	2.0.0	5.0.0

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GSR-220	Space to Ground Communication Services	The JPSS Ground System shall interface with Kongsberg Satellite Services (KSAT) for TT&C and SMD in accordance with the JPSS GS to KSAT IRD (474-00109).	This IRD will include all support from KSAT to JPSS Ground Project. Svalbard will be a primary Ground Station site for the TT&C and SMD. GCOM-W1 support is limited to SMD support only.	Interface	S-NPP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0
GSR-234	Operations Support Interfaces	The JPSS Ground System shall interface to the NASA Flight Dynamics Facility as defined in the NRD for JPSS-1 (450-NRD-JPSS1).	The Flight Dynamics Facility provides definitive post-maneuver orbital data.	Interface	JPSS-1	CGS	2.0.0	5.0.0
GSR-238	Operations Support Interfaces	The JPSS Ground System shall interface with the JPSS Flight Project spacecraft and instrument support nodes for full life cycle support in accordance with the JPSS Ground Project to Flight Project IRD (474-00223).	The JPSS Ground System requires sustainment support for the Instrument and Spacecraft Support Nodes.	Interface	S-NPP JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0
GSR-1220	Operations Support Interfaces	The JPSS Ground System shall interface with NASA's Conjunction Assessment Risk Analysis (CARA) for conjunction assessment services directly in accordance with the JPSS GS CA IRD (474-00300).	JPSS must maintain interfaces to the S-NPP and JPSS satellites. NASA's CARA provides conjunction analysis and collision avoidance maneuver verification support to JPSS operations. These interfaces are critical to maintaining safe operations of JPSS/NOAA-managed space assets.	Interface	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-250	Launch Support Segment Interfaces	The JPSS Ground System shall interface to the JPSS-1 Launch Facility in accordance with the JPSS-1 Launch Site Support Plan (LSP-PLN-333.01-JPSS-1-LSSP).	The JPSS-1 mission requires the capability for satellite testing while at the launch site, as well as final ground/flight configuration synchronization prior to the launch of JPSS-1.	Interface	JPSS-1	CGS	2.0.0	5.0.0
GSR-822	Facility Interfaces	The JPSS Ground System shall interface with the NOAA NSOF facility in accordance with the JPSS GS to NSOF Facilities IRD (474-00306).	Facility level requirements to support JPSS systems at the NSOF will be captured in a stand-alone IRD/ICD suite of documents. Mission Effectivity applies to the missions supported from the facility, not data routing.	Interface	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-823	Facility Interfaces	The JPSS Ground System shall interface with the NESDIS CBU facility in accordance with the JPSS GS to NESDIS CBU Facilities IRD (474-00310).	Facility level requirements to support JPSS systems at the NSOF COOP Facility will be captured in a stand-alone IRD/ICD suite of documents. Mission Effectivity applies to the missions supported from the facility, not data routing	Interface	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-1177	Uplink Processing	The JPSS Ground System shall uplink data to JPSS-managed satellites.	The ground system must be capable of transmitting commands, table updates, and flight software loads to S-NPP, JPSS-1, and JPSS-2.	Functional	S-NPP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0
GSR-1182	Uplink Processing	The JPSS Ground System shall store uplink data at KSAT transmitting ground stations in accordance with the implementing agreement between NOAA and NSC on Cooperation (11/28/08 & 4/2/02).	This is to cover the unique requirement for the Svalbard site and is not applicable for any other ground station. The data that will be stored includes uplink and antenna tracking data.	Functional	S-NPP JPSS-1 JPSS-2	KSAT Ground Project	2.0.0	5.0.0

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GSR-1178	Downlink Processing	The JPSS Ground System shall provide telemetry downlink processing.	The ground system must be capable of receiving telemetry from the spacecraft at the ground stations storing it at the receive location (per GSR-100), and delivering it for processing. The referenced documents provide information about the telemetry data structure and content and the radio frequency of the downlink.	Functional	S-NPP DMSP JPSS-1 JPSS-2	CGS KSAT Ground Project	2.0.0	5.0.0
GSR-1179	Downlink Processing	The JPSS Ground System shall acquire downlinks to receive telemetry from JPSS missions.	The Ground System is responsible for establishing the communications link between the satellite and ground. That link is the mechanism for receiving telemetry data.	Functional	S-NPP DMSP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0
GSR-100	Downlink Processing	The JPSS Ground System shall retain all received satellite downlink data at the receiving ground station for a minimum of seven days.	The JPSS Ground System must retain data at ground stations for a sufficient period to allow recovery from communications network outages.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0
GSR-1183	Downlink Processing	The JPSS Ground System shall acquire SMD from the JPSS-managed satellites.	The JPSS Ground System must perform SMD acquisition for JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0
GSR-3233	Downlink Processing	The JPSS Ground System shall acquire HRD from the JPSS satellite in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).	The JPSS Ground System performs HRD acquisition for JPSS satellites via the X-band link. The IRD provides the necessary information for usage of that link.	Functional	JPSS-1	CGS	2.0.0	5.0.0

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GSR-253	Manage Ground Station	The JPSS Ground System shall be capable of supporting operations over the TT&C S-Band forward and return links, while acquiring SMD return links and monitoring direct broadcast links simultaneously for any JPSS-managed satellite.	All TT&C operations, SMD acquisition and direct broadcast monitoring must be performed in parallel given the limited pass time for any given ground site.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-481	Manage Ground Station	The JPSS Ground System shall manage all Space/Ground Communication Node resources.	The JPSS Ground System links and their associated equipment must be available when required to communicate with the satellites. Ensuring that availability is the responsibility of the Ground System.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-622	Manage Ground Networks	The JPSS Ground System shall manage all Ground Network Node resources.	The JPSS Ground Networks typically operate in a long term configuration. However, the Ground Networks will require updating, enhancement, expansion and reconfiguring over the life of the Ground System. This function provides those capabilities across the Ground Network Node. This function would also provide the capability to allocate bandwidth for data transferred between Svalbard and CONUS among missions.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0

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GSR-337	Provide Distributed Communication Services	The JPSS Ground System shall provide network communications between the internal elements of the ground system.	The JPSS Ground System includes ground stations, data processing sites, mission management sites, and connectivity to archiving, flight dynamics, launch facilities, spacecraft and instrument developers, the ground system developer and other sites. The JPSS Ground System must provide WAN connectivity between the sites internal to the JPSS ground system.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-492	Provide Distributed Communication Services	The JPSS Ground System shall provide voice communications circuits among JPSS facilities.	The JPSS Ground System includes ground stations, data processing sites, mission management sites, and connectivity to archiving, flight dynamics, launch facilities, spacecraft and instrument developers, the ground system developer and other sites. The JPSS Ground System must provide WAN connectivity between the sites internal to the JPSS ground system.	Functional	JPSS-1 JPSS-2	Ground Project	2.0.0	5.0.0
GSR-2318	Provide Distributed Communication Services	The JPSS Ground System shall make any MSD (e.g., satellite ephemeris, ancillary data) needed to produce xDRs available to the user community.	Field Terminal Users require MSD in order to produce data products.	Functional Performance	S-NPP JPSS-1 JPSS-2	CGS FTS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-338	Provide Distributed Communication Services	The JPSS Ground System shall provide network communications to external elements for the exchange of mission data.	The JPSS Ground System includes ground stations, data processing sites, mission management sites, and connectivity to archiving, flight dynamics, launch facilities, spacecraft and instrument developers, the ground system developer and other sites. The JPSS Ground System must provide WAN connectivity between the sites external to the JPSS ground system in accordance with ICDs which state the agreed demarcation points and data formats.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-284	Provide Distributed Communication Services	The JPSS Ground System shall utilize Wide Area Network (WAN) services that only employ lossless compression techniques when compression is needed.	The ground system must not employ data compression or other techniques which reduce the resolution of data as provided by spacecraft. This applies to data processing as well as data communications.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-1668	Provide Distributed Communication Services	The JPSS Ground System shall provide Data Routing services.	A high availability WAN will allow critical mission data (e.g., SMD) to flow from the acquisition GSNs to the DPNs at a rate sufficient to meet JPSS product latency and data availability requirements. This requirement does not preclude the use of optimizing proxy protocols over segments of the network that experience high latency and/or high packet loss that degrade the performance of TCP/IP. The use of optimizing protocols should be transparent to the end systems (applications) implementing TCP/IP based interfaces. Third party applications may be implemented to achieve efficient transfer of large data volumes over high bandwidth WAN links if normal protocols do not support the parameters of delivery (high efficiency and guaranteed delivery) over low latency/low loss links. A highly efficient wide area network provides the cost benefit of not having to procure extra bandwidth to accommodate degraded throughput to meet system latency and capacity requirements.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-3208	Provide Distributed Communication Services	The JPSS Ground System shall store Mission Support Data (MSD) files for a minimum of seven days at the Data Processing Nodes.	The MSD files must be stored to support MSD processing and product generation timelines.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-3261	Provide Distributed Communication Services	The JPSS Ground System shall provide Network Communication Services that meet a minimum throughput efficiency of 90%.	The flow of mission data throughput must be at a rate sufficient to meet JPSS product latency and data availability requirements.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3282	Reliable SMD Transfer	The JPSS Ground System shall perform multimission SMD CCSDS SLE and CCSDS AOS processing (VCDU with header extensions and APID extraction) on SMD acquired by the JPSS Space Ground Communications Node at a central location.	For reliable SMD transfer, a centralized location allows for universal data accounting of received data as well as supporting cost-effective connection-oriented data transfers. The centralized location will also have a backup for COOP purposes. The planned centralized locations are the NSOF and CBU locations.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3317	Reliable SMD Transfer	The JPSS Ground System shall remove duplicative data from the SMD acquired at the SMD Hub location.	The SMD Hub tracks the completeness of data and can identify and remove duplicate data.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3283	Reliable SMD Transfer	The JPSS Ground System shall extract application packet identifiers (APIDs) from VCDUs in accordance with the CCSDS AOS Spec.	The SMD Hub identifies the APIDs and Virtual Channels associated with each satellite.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3364	Reliable SMD Transfer	The JPSS Ground System at the Space/Ground Communications Node shall annotate all Virtual Channel Data Units (VCDUs) with ground receipt information.	SMD will utilize CCSDS SLE services for transmission to the JPSS SMD Hub (JSH).	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-3286	Reliable SMD Transfer	The JPSS Ground System shall forward configurable sets of SMD application packets to configured destinations.	The SMD Hub is configurable as to which APIDs are sent to which destination. Furthermore, configurable destinations include the DPN, alternate DPN, FNMOC, NAVOCEANO, MON Payload Store (replacement for PST).	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1674	Reliable SMD Transfer	The JPSS Ground System shall store non-duplicate SMD from JPSS-managed satellites for at least seven days.	SMD includes science APs, S-TLM and any unidentified APs from the spacecraft. This store allows for the retransmission of received data without burdening the JPSS network with having to pull data from the remote ground stations.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3319	Reliable SMD Transfer	Upon request from authorized Hub users, the JPSS Ground System shall retransmit stored SMD.	The SMD Hub can retransmit received data to resolve back-end communications issues with its configurable destinations.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3320	Reliable SMD Transfer	The JPSS Ground System SMD Hub shall notify operations regarding missing data from JPSS-managed satellites.	The SMD Hub is responsible for tracking the completeness of data received at the various JPSS ground stations. This notification allows for the scheduling of retransmissions from the appropriate satellite.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

DOORS ID	Section Title	Ground System Requirements Document Volume 1	Rationale	Requirement Type	Mission Effectivity	Allocated To	Block Start	Block End
GSR-404	Flight Operations	The JPSS Ground System shall allow only a single command source at any given time for any JPSS-managed satellite.	Commanding of JPSS-managed satellites must be constrained to a single command source within the JPSS Management & Operations node. In combination with operational availability, this requirement implies the ability to hand over the command source role quickly in event of anomalies with the HW or SW at the command source.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-394	Flight Operations	The JPSS Ground System shall ensure operations have complete and timely situational awareness of all JPSS Flight System resources.	Situational Awareness includes state of health, performance statistics, capacities, margins, security status etc., of JPSS HW and SW. It is collected and logged at each JPSS resource location, with summary reporting, heart-beat and AWE reporting back to operations on a selectable cycles and conditions.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-89	Flight Operations	The JPSS Ground System shall perform command and control of JPSS-managed satellites.	The primary function of the JPSS Ground System is to provide flight operations capabilities for managing JPSS-managed flight resources.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-154	Flight Operations	The JPSS Ground System shall validate all flight system commands, table loads and flight software prior to upload to the satellites.	When uploads are to be made to JPSS-managed satellites, the system must assess upload constraints against the current state of the system to ensure proper and successful execution of the upload. Validation is focused on format, range, data typing, structure, and a pre-defined subset of preconditions.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-91	Flight Operations	The JPSS Ground System shall manage the on-orbit configuration of all JPSS-managed satellites.	The JPSS Ground System must maintain the on-orbit configuration of satellite hardware, software and tables. It also must be able to update the on-board configuration to ensure JPSS-managed satellites continue to meet their Ao requirements.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-90	Flight Operations	The JPSS Ground System shall assess all flight activities for JPSS-managed satellites.	JPSS Ground system must assess and report all on-orbit operations. This includes assessment against planned activities.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-259	Flight Operations	The JPSS Ground System shall configure the content of the TT&C downlinks for JPSS-managed satellites.	The content of the TT&C downlink (real-time and stored) is managed by the JPSS Ground System in order to adjust satellite state of health reporting as needed.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-260	Flight Operations	The JPSS Ground System shall configure the content of the direct broadcast downlinks for JPSS-managed satellites.	The JPSS Ground System must configure, monitor and manage the direct broadcast links to ensure proper operation.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-261	Flight Operations	The JPSS Ground System shall configure the content of the SMD downlinks for JPSS-managed satellites.	The content of the SMD downlink is managed by the JPSS Ground System in order to adjust satellite state of health reporting as needed.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-262	Flight Operations	The JPSS Ground System shall maintain operational and residual satellites relative phasing.	Ground contact conflicts can impact sensor data acquisition, thus impacting latency and completeness. Planning and scheduling needs to ensure optimal use of ground station assets.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-256	Flight Operations	The JPSS Ground System shall manage all ground and flight system calibration products in order to meet data product quality requirements, as specified in the GSRD Volume 2.	Up to date Flight System calibration data is required in order to achieve the required weather product quality and precision. Management includes monitoring, verifying, updating and distributing the calibration data as needed to meet L1 performance metrics.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0

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GSR-92	Flight Operations	The JPSS Ground System shall manage the operational databases.	Each of these databases is the definitive source of definitions for the functions it supports. They are developed and maintained from mission-specific source documents. The databases include command and telemetry; memory structure/table formats; and data product generation.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-159	Flight Operations	The JPSS Ground System shall utilize NASA's Space Network to provide concurrent full-orbit TT&C coverage for critical operations.	The NASA Space Network provides full orbit communications in order to support mission critical operations which fall outside or extend beyond the periods of ground station contacts. All mission critical activities (e.g., launch, on-orbit checkout, orbit maintenance maneuvers) require real-time communications coverage to reduce risk to the overall mission. Concurrent coverage implies the JPSS Ground Station can be communicating with a JPSS-managed satellite via SN and a Ground Station simultaneously, with only one path acting as the active command link.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-153	Flight Operations	The JPSS Ground System shall manage end-of-life satellite disposal in accordance with the NASA Procedural Requirements for Limiting Orbital Debris, (NPR 8715.6A) and the Process for Limiting Orbital Debris (NASA-STD-8719.14).	Spacecraft must not be allowed to deorbit in an uncontrolled manner to prevent the possibility of personal injury, property damage or damage to other spacecraft.	Functional	S-NPP JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0
GSR-3234	Flight Operations	The JPSS Ground System shall process S-band telemetry from JPSS-managed satellites.	Telemetry information must be made available in near real-time after receipt to ensure that the latest information about spacecraft and sensor performance and state of health are known. Processing includes the ingest.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3357	Flight Operations	The JPSS Ground System shall perform Ka-band AOS CCSDS preprocessing for the JPSS missions in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173) at each JPSS Ground Station.	Telemetry information must be made available in near real-time after receipt to ensure that the latest information about spacecraft and sensor performance and state of health are known. Processing includes the ingest.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3366	Flight Operations	The JPSS Ground System shall acquire Telemetry at the JPSS CGS Ground Stations to enable extraction of the bit stream in accordance with the IRD for RF Interfaces To and From the JPSS Satellites (472-00173).	Ground Station performs tracking, down conversion to IF, demodulation and decoding of the CCSDS Telemetry Channel Coding applied by the satellite prior to baseband preprocessing function.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-146	Orbit/Attitude Management	The JPSS Ground System shall predict orbital events for all JPSS-managed satellites.	Prediction of orbital events such as occultation, terminator crossings, and geometric events is necessary for spacecraft management. Spacecraft management also includes planning maneuvers to avoid orbital debris that pose a credible threat to mission success.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-140	Orbit/Attitude Management	The JPSS Ground System shall perform orbit determination for all JPSS-managed satellites.	The ground system will capable of performing orbit determination solutions independent of the flight system. Orbit and attitude knowledge is integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing orbit determination.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-142	Orbit/Attitude Management	The JPSS Ground System shall verify the spacecraft on-board attitude determination solution for JPSS-managed satellites.	Spacecraft use attitude data for antenna pointing, thermal management, and other uses. Orbit and attitude knowledge is also integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing attitude determination.	Functional	S-NPP JPSS-1 JPSS-2	AGS	2.0.0	5.0.0

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GSR-34	Orbit/Attitude Management	The JPSS Ground System shall maintain the JPSS-managed satellites in the designated orbits as specified in the JPSS Program Level 1 Requirements Document (JPSS-REQ-1001).	In order to operate the S-NPP and JPSS satellites in their proper orbits, the JPSS Ground System must perform orbital maintenance. S-NPP requirement is derived from the JPSS requirement, as it is not included in the L1RD.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-152	Orbit/Attitude Management	The JPSS Ground System shall generate spacecraft maneuver commands for all mission phases.	The JPSS Ground System must perform all calculations and generate commands to adjust orbits and perform attitude maneuvers of JPSS-managed satellites. Orbits are adjusted to maintain design orbits, perform collision avoidance maneuvers, execute end-of-life disposal and perform calibration maneuvers.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-155	Orbit/Attitude Management	The JPSS Ground System shall utilize NASA CARA for collision avoidance alerts, planning and execution.	Collision avoidance planning is necessary to minimize the risk of JPSS-managed spacecraft damage or damage to other spacecraft. GSFC-managed missions are required to have this capability, as per GPD 7120.1A, "GSFC Space Asset Protection Policy and the Process for Limiting Orbital Debris (NASA-STD-8719.14)".	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-3402	Orbit/Attitude Management	The JPSS Ground System shall provide a time-tagged orbital position estimate accurate to 75/75/75 meters, 3 sigma for radial/in-track/cross-track components.	The ground system will be capable of generating orbit determination solutions independent of the flight system. Orbit and attitude knowledge is integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing orbit determination.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3403	Orbit/Attitude Management	The JPSS Ground System shall provide a time-tagged attitude estimate accurate to 90 arcsec, 3 sigma per axis.	The ground system will be capable of performing ground-based attitude determination independent of the flight system. Orbit and attitude knowledge is integral to JPSS meeting observational data geolocation requirements. It is essential to verify that the spacecraft is correctly performing attitude determination.	Functional	S-NPP JPSS-1 JPSS-2	AGS	2.0.0	5.0.0
GSR-268	Analysis and Trending	The JPSS Ground System shall provide the capability to perform trending on all aspects of JPSS-managed satellites.	Long term trending includes processing all stored health and safety telemetry from the spacecraft and sensors.	Functional	S-NPP JPSS-1 JPSS-2	CGS AGS	2.0.0	5.0.0

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GSR-114	Analysis and Trending	The JPSS Ground System shall perform trending on the Ground System Status.	Trending and analysis of system performance relies on a comprehensive archive of data and events. System model development to support system evolution can be validated against this archive. All status data reported by components in the JPSS, both fleet and ground, are monitored and logged with time tags to be accessible for analysis subsequent to the time it was logged. Status includes state of health and state of service.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-119	Analysis and Trending	The JPSS Ground System shall allow operators to retrieve archived data based on user-defined search parameters.	Operators are required to retrieve data based on various parameter searches for real-time and long-term analysis.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-121	Analysis and Trending	The JPSS Ground System shall provide analysis functions and tools for trend analysis over any user-defined time period from one orbit to one year.	Operators must have the ability to examine trends over a wide variety of time periods to assess the health of the system and aid in fault diagnosis. This should be done using a set of analysis and engineering tools which reduces the need to develop custom tools for operators.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-1700	Ground Operations	The JPSS Ground System shall control ground system resources to ensure their availability when required for JPSS-managed and supported missions.	Control of ground system resources involves monitoring and changing configurations as required by the various JPSS-supported missions. It also involves scheduling downtime for maintenance and equipment change outs so as not to adversely impact support to the missions.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-393	Ground Operations	The JPSS Ground System shall ensure operations have complete and timely situational awareness of all JPSS Ground System resources.	Situational Awareness includes state of health, performance statistics, capacities, margins, security stats etc., of JPSS HW and SW. It is collected and logged at each JPSS resource location, with summary.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-1699	Ground Operations	The JPSS Ground System shall validate ground commands prior to their execution.	The JPSS Ground System must validate ground control commands against pre-defined command limits prior to executing the implementation plan.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-134	Ground Operations	The JPSS Ground System shall display system status to operators in near real-time.	It is essential to provide situational awareness to operators on a real-time or near real-time basis.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0

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GSR-303	Ground Operations	The JPSS Ground System shall generate data metrics for all data processed.	The Ground System must provide real-time monitoring of the data processing for the support of missions.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-304	Ground Operations	The JPSS Ground System shall generate data accounting metrics for all received data.	The Ground System must provide real-time monitoring of the accounting of data within the ground system.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-305	Ground Operations	The JPSS Ground System shall generate data accounting metrics for all delivered data.	To ensure accurate delivery of data, the Ground System must continuously monitor the delivery of data so it can be corrected in case of data loss or errors. GCOM-W1 effectivity is limited to RDR product generated.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1731	Ground Operations	The JPSS Ground System shall be capable of transmitting data via the SN/WSC to the JPSS satellites.	The JPSS Ground System utilizes SCaN, SN, services for S-Band command of JPSS-managed missions. CGS is responsible for getting command data at WSC. SCaN is responsible for uplink of command via TDRSS to JPSS-managed satellites.	Functional	S-NPP JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0

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GSR-3265	Ground Operations	The JPSS Ground System shall be capable of receiving data from the JPSS satellites via SN/WSC.	The JPSS Ground System utilizes SCaN, SN, services for S-Band and Ka-Band return link data for JPSS-managed satellites. CGS is responsible for getting data from WSC. SCaN is responsible for return link data via JPSS-managed satellites via TDRSS.	Functional	S-NPP JPSS-1 JPSS-2	CGS Ground Project	2.0.0	5.0.0
GSR-306	Ground Operations	The JPSS Ground System shall monitor communications network operation.	The JPSS Ground System must maintain awareness of the availability of primary and backup communications channels to ensure communications reliability. Includes whether network is up or down and heavily it is being utilized or planned to be utilized.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-133	Ground Operations	The JPSS Ground System shall monitor services provided by external entities.	The primary function of the control center is to monitor and control JPSS resources and activities. Insight must be provided into services provided by external entities such as the NASA Space Network, Ground Network, commercial ground stations, WAN providers, and other entities outside the actual JPSS Ground System.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0

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GSR-73	Ground Operations	The JPSS Ground System shall manage Mission Support Data.	Mission Support Data is utilized across the JPSS Ground System and by external users and has to be collected, maintained, kept current, and distributed to various functions and operational processes.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS GRAVITE	2.0.0	5.0.0
GSR-139	Ground Operations	The JPSS Ground System shall log operations activities for each service provided including scheduled activity preparation, execution and performance.	The JPSS Ground System requires that a record of the actual services provided and the associated performance measures are recorded and maintained.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-1710	Ground Operations	The JPSS Ground System shall predict Radio Frequency Interference (RFI) events between JPSS-managed satellites and known other satellite systems.	Prediction of RFI events is necessary to ensure communications integrity and non-interference by JPSS with other satellites or by other satellites with JPSS.	Functional	S-NPP JPSS-1 JPSS-2	CGS KSAT	2.0.0	5.0.0

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GSR-81	Mission Planning	The JPSS Ground System shall perform Mission Planning and Scheduling for the JPSS Program.	A core requirement of the JPSS Ground System is to plan and schedule the resources necessary to operate the system and provide data to end users. Note that some assets are not under the direct control of the JPSS Ground System and coordination must be done to ensure the availability of data and resources.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-644	Mission Planning	The JPSS Ground System shall schedule sensor Calibration/Validation activities.	In order to consistently meet quality and precision requirements the JPSS Ground System must be able to schedule required updates to flight system Calibration/Validation operations to assess flight system performance.	Functional	S-NPP JPSS-1 JPSS-2	CGS Algorithm Provider	2.0.0	5.0.0
GSR-83	Mission Planning	The JPSS Ground System shall coordinate with external programs to perform the Mission Planning and Scheduling of JPSS resources.	Some assets are not under the direct control of the JPSS Ground System and coordination must be done to ensure the availability of data and resources.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS KSAT Ground Project	2.0.0	5.0.0

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GSR-88	Mission Planning	The JPSS Ground System shall maintain a JPSS master schedule.	The master schedule should include all scheduled activities and services both within the ground system and those scheduled with external entities. The master schedule is a critical aspect of ground system operations.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-137	Mission Planning	The JPSS Ground System shall generate schedules detailing the configuration of assets necessary to provide services.	Schedules should provide sufficient detail to identify the equipment, resources and staff necessary to achieve each scheduled item.	Functional	S-NPP DMSP Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-102	Manage M&O Node	The JPSS Ground System shall store all data transmitted to JPSS-managed satellites for the life of the program.	The JPSS Ground System must retain all transmitted data for the life of the program. A record of all commands, command loads and table loads must be maintained for each JPSS satellite, along with any responses or assessments on the success of the action from the flight system or ground control systems. This data is important for auditing activities and to aid in fault diagnosis.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-112	Manage M&O Node	The JPSS Ground System shall centrally archive all operations data for the life of the program.	Data must be retained in on-line storage to facilitate retrieval for normal operations and be archived to allow retrieval of historical data. CLASS is the central system for providing archival storage of observational products. On-line data is defined here as SMD, stored telemetry, MSD, and SMD products that are available in short term storage areas of CGS whereas archival storage is all data that is stored at CLASS.	Functional	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-49	Collect Data Product Input	The JPSS Ground System shall ingest stored mission data from JPSS SMD Hub.	JPSS must deliver a complete set of data products from the S-NPP and JPSS Satellites. JPSS must generate RDRs for the GCOM-W1 satellite.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3398	Collect Data Product Input	The JPSS Ground System shall support instruments with configurable data rates as defined in the JPSS-1 MDFCB (472-00251).	JPSS GS must provide a configurable ingest process to handle changes in instrument data rates should Flight choose to change those onboard data rates.	Functional	JPSS-1	FVTS Algorithm Provider	2.0.0	5.0.0
GSR-3400	Collect Data Product Input	The JPSS Ground System shall implement decompression for all compressed instrument data received from the satellite.	JPSS GS must decompress any compressed instrument data prior to the generation of higher-order data products.	Functional	S-NPP JPSS-1	CGS	2.0.0	5.0.0

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GSR-3401	Collect Data Product Input	The JPSS Ground System shall support multiple APIDs from a given instrument in support of lossless data compression or uncompressed data coming from a given instrument.	JPSS GS must be able to handle the use of separate APIDs for compressed or uncompressed data coming from a given vehicle instrument. The exception to this case is NPP VIIRS which is using a single APID with a bit set in the secondary header to indicate compression.	Functional	S-NPP JPSS-1	CGS FVTS	2.0.0	5.0.0
GSR-2320	Produce Data Products	The JPSS Ground System shall produce an EDR from the available data.	The EDR may be degraded. However, delivery of the degraded product is still required along with a flag indicating the degraded quality.	Functional Performance	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3354	Produce Data Products	The JPSS Ground System shall be configurable to select either official or alternate ancillary data for the generation of data products.	DPN can utilize alternate ancillary data instead of the official ancillary data when those are not available or lesser quality. The resulting alternate products are in lieu of the official products and do not impact the DPN processing and storage usage. They are not required to meet all quality or performance requirements. They must be identified as alternate on the product name and metadata.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-113	Produce Data Products	The JPSS Ground System shall provide capacity for on-line storage of all science product related data storage for a minimum of seven days.	The JPSS Ground System must have sufficient storage capacity to allow normal operations while archiving data. Frequently accessed data must remain in on-line storage until transferred to the central archive.	Performance	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-335	Produce Data Products	The JPSS Ground System shall format data products in accordance with the JPSS Algorithm Specification Volume II: Data Dictionary (474-00448-02-01 through 474-00448-02-30).	The relevant Algorithm Specification, Volume II Data Dictionary determines what artifacts are needed on a per-product basis.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3156	Produce Data Products	In support of graceful degradation, the JPSS Ground System shall be capable of generating data products that may not meet specified algorithm performance requirements.	When primary inputs are not available for data product processing, products need to be generated using secondary or tertiary inputs as specified in the EDR IR. These degraded products are not required to meet the algorithm performance requirements.	Functional	S-NPP JPSS-1 JPSS-2	CGS Algorithm Provider	2.0.0	5.0.0
GSR-3236	Produce Data Products	The JPSS Ground System shall produce data products for JPSS satellites in accordance with the GSRD Volume 2.	The specific data records are detailed in the GSRD Volume 2.	Functional	JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-3209	Produce Data Products	JPSS Ground System shall produce data products per GSRD Volume 2 from all secondary operational sensors on JPSS-managed satellites concurrently.	The Ground System must produce products from the operational sensors on two different satellites concurrently during the Calibration/Validation period which may last up to one year. It is possible that the primary operational sensors could be divided between two satellites, e.g., a VIIRS, CrIS and ATMS on JPSS-1 and an OMPS on S-NPP. If this situation exists when JPSS-2 is launched, a VIIRS could be still be an operational secondary sensor on S-NPP, which would require processing VIIRS from 3 satellites until the J-2 Calibration/Validation period is over and a decision is (or is not) made to turn VIIRS off on S-NPP.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1737	Produce Data Products	The JPSS Ground System shall ensure that the recovery of missed data shall not impact the delivery of data that can still meet EDR latency requirements.	The JPSS Ground System must continue to deliver data and meet latency while concurrently recovering and processing damaged or missed data.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-1747	Produce Data Products	The JPSS Ground System shall produce a quality flag to indicate the application and identity of a degradation condition to a retrieved value in a data record.	The JPSS Ground System must indicate when a degradation condition has occurred.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1750	Produce Data Products	The JPSS Ground System shall produce a quality flag to indicate the application and identity of an exclusion condition to a retrieved value in a data record.	The JPSS Ground System must indicate when an exclusion condition has occurred.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1736	Produce Data Products	In a missed pass scenario, the JPSS Ground System shall recover data on subsequent passes.	The JPSS Ground System must continue to deliver data and meet latency while concurrently recovering and processing damaged or missed data.	Functional	S-NPP JPSS-1	CGS	2.0.0	5.0.0
GSR-1240	Distribute Data Products	The JPSS Ground System shall deliver data products including all xDR associated descriptive information (e.g., metadata) to CLASS for long term storage.	CLASS is a designated storage for JPSS observational data and supporting data.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3200	Distribute Data Products	The JPSS Ground System shall deliver RDRs and Metadata to the Science Data Segment (SDS).	SDS requires JPSS data products and supporting data.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3170	Distribute Data Products	The JPSS Ground System shall deliver data products to the NESDIS ESPC.	NESDIS ESPC requires JPSS data products and supporting data.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-3172	Distribute Data Products	The JPSS Ground System shall make available SMD APs to the FNMOC.	FNMOC requires JPSS observational data in order to produce EDRs.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3173	Distribute Data Products	The JPSS Ground System shall make available SMD APs to the NAVOCEANO.	NAVOCEANO requires JPSS data in order to produce EDRs.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3239	Manage Product Generation and Distribution	The JPSS Ground System shall be configurable to make data products available to authorized users.	The Ground System need to be able to restrict the availability of certain products (e.g., GCOM-W1 RDR) to certain recipients, or classes of recipients. Authorized recipients will be as directed by the JPSS Ground Project.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-673	Data Assurance	The JPSS Ground System shall provide a process for recovery of damaged or missing SMD data from JPSS-managed assets.	To ensure the integrity of data products it will be necessary to attempt to recover missing or damaged data. For GCOM-W1, only retransmitted internal to the ground system.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0
GSR-1654	Data Assurance	The JPSS Ground System shall provide data quality monitoring capability at the NSOF.	The data quality threshold files produced are used during the production of data products to support data product quality analysis.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE SPS	2.0.0	5.0.0
GSR-828	Simulate Flight Operations	The JPSS Ground System shall develop and maintain a simulation capability consisting of a high fidelity authentic simulation of the spacecraft, instruments, and ground system.	The JPSS Ground System must include a high fidelity simulation capability that is similar in form, fit, function, and timing to the actual spacecraft and instruments.	Functional	S-NPP JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0

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GSR-1605	Simulate Flight Operations	The JPSS Ground System shall be capable of simulating command and control of three satellites simultaneously.	Simulation of the operational constellation is required to support studies, assess changes in capabilities, and to assist in anomaly resolutions. Multiple simulators may be needed in order to meet this requirement.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0
GSR-1199	Simulate Flight Operations	The JPSS Ground System simulation capability shall support validation of the Flight Products.	The simulation capability has to support validation of the JPSS-managed flight products.	Functional	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0
GSR-1200	Simulate Flight Operations	The JPSS Ground System simulation capability shall support verification and validation of the JPSS Ground System.	The simulation capability has to support ground system evolution through testing.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0
GSR-1201	Simulate Flight Operations	The JPSS Ground System simulation capability shall support JPSS pre- and post-launch operations (Launch minus 12 months through decommissioning) and Mission Availability over the mission lifetime.	The simulation capability has to support the full life cycle development and operations.	Functional	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0
GSR-1202	Simulate Flight Operations	The JPSS Ground System simulation capability shall execute the Flight Software (Spacecraft and Instruments) and the Ground Software.	The simulation capability must provide a realistic environment for replicating system behavior (functional). FVS can partially do this. Runs the S/C FSW and the VIIRS FSW.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0

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GSR-1203	Simulate Flight Operations	The JPSS Ground System simulation capability shall exhibit real-time response behavior with respect to operation of the JPSS-managed satellites.	The simulation capability must provide a realistic environment for replicating system behavior (timing).	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0
GSR-1212	Simulate Flight Operations	The JPSS Ground System simulation capability shall support operator training and certification.	Must provide the capability to train and certify operations personnel.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0
GSR-1213	Simulate Flight Operations	The JPSS Ground System simulation capability shall support anomaly investigation.	Must provide capability to investigate system anomalies.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0
GSR-156	Manage Simulators	The JPSS Ground System shall provide access to spacecraft simulators for all authorized mission users.	Access to spacecraft simulators for all controlled spacecraft is necessary to validate commands prior to execution and for fault analysis.	Functional	S-NPP JPSS-1 JPSS-2	FVS FVTS	2.0.0	5.0.0
GSR-1214	Manage Simulators	The JPSS Ground System simulation capability shall be configurable by operations personnel.	Should be able to switch between modes of operations (e.g., training, anomaly resolution) without software modification.	Functional	JPSS-1 JPSS-2	CGS FVTS	2.0.0	5.0.0
GSR-1215	Manage Simulators	The JPSS Ground System simulation capability shall be re-configured to a new state within two hours.	Need to bound the time required to transition the purpose of the simulator (e.g. training, anomaly resolution)	Functional	JPSS-1 JPSS-2	FVTS	2.0.0	5.0.0

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GSR-642	Maintain & Calibrate Algorithms	The JPSS Ground System shall monitor and report sensor performance in terms of calibration/validation metrics.	The monitoring and reporting of sensor performance is critical to ensuring JPSS observational products consistently meet quality and precision requirements. The operational reporting of sensor performance parameters critical to data product performance is largely accomplished through the use of data product quality flags.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0
GSR-1227	Maintain & Calibrate Algorithms	The JPSS Ground System shall validate Algorithm/Table Change Packages for operational algorithms.	Throughout the life of JPSS satellites changes to tables and algorithms will be required due to a variety circumstances such as satellite limitations or degraded sensor capabilities. When those changes are necessitated, the Ground System is responsible for generating and testing them and then delivering them into the operational environment.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0

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GSR-643	Maintain & Calibrate Algorithms	The JPSS Ground System shall monitor data products and reports in accordance with the GSRD Volume 2.	Monitoring ground system data products are critical to ensuring JPSS observational products consistently meet quality and precision requirements. The operational reporting of algorithm performance parameters critical to data product performance is largely accomplished through the use of data product quality flags.	Functional	S-NPP JPSS-1 JPSS-2	CGS GRAVITE	2.0.0	5.0.0
GSR-645	Maintain & Calibrate Algorithms	The JPSS Ground System shall verify algorithm and table updates.	In order to consistently meet quality and precision requirements the JPSS Ground System must verify that all algorithm updates meet the specified quality and accuracy requirements.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE SPS	2.0.0	5.0.0
GSR-648	Maintain & Calibrate Algorithms	The JPSS Ground System shall produce flight system calibration data updates.	The JPSS Ground System will generate flight segment calibration/validation configuration data as needed to consistently meet the specified quality and accuracy requirements.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0
GSR-649	Maintain & Calibrate Algorithms	The JPSS Ground System shall produce ground system calibration data updates.	The JPSS Ground System will generate ground segment calibration/validation configuration data as needed to consistently meet the specified quality and accuracy requirements.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0

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GSR-651	Manage Cal/Val Node	The JPSS Ground System shall generate State of Health data for the Cal/Val node.	In order to achieve operational situational awareness the calibration/validation node of the JPSS Ground System must provide regular State of Health information to operations.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0
GSR-652	Manage Cal/Val Node	The JPSS Ground System shall provide the infrastructure necessary to perform calibration and validation.	In order to consistently meet quality and precision requirements the JPSS Ground System must provide the environment, tools and services to perform calibration and validation.	Functional	S-NPP JPSS-1 JPSS-2	GRAVITE	2.0.0	5.0.0
GSR-334	Support FT Operations	The JPSS Ground System shall provide a library for Field Terminal related specifications for access by Field Terminal Users.	The JPSS Ground System must provide the Field Terminal user community specifications for hardware/software, antenna, and storage requirements, needed to receive the direct broadcast data.	Functional	S-NPP JPSS-1 JPSS-2	FTS	2.0.0	5.0.0
GSR-2319	Support FT Software	The JPSS Ground System shall make available to the Field Terminal User Community ground processing software and algorithms to enable Field Terminal Users to process direct broadcast data.	The JPSS Ground Project will provide the Field Terminal user community processing software/algorithms for processing received direct broadcast data.	Functional	S-NPP JPSS-1 JPSS-2	FTS	2.0.0	5.0.0

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GSR-1175	Direct Broadcast Monitoring	The JPSS Ground System shall monitor the HRD Direct Broadcast from JPSS-managed satellites for a minimum of 3 times per day per satellite.	Monitoring of the HRD is required to ensure that the service is functional and that the data being provided is what the recipients expect with regard to quality and timeliness. The link will be checked 3 times per day.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3201	Provide Continuity of Operations	The JPSS Ground System shall provide backup ground system capabilities including command, control and data processing in support of Continuity of Operations (COOP) at the Consolidated Backup (CBU) facility in Fairmont, WV.	NOAA COOP plans ensure the continuance of mission essential functions at an alternate facility in the event of a COOP incident. Reference: 7/11/12 - Guidance letter and L1RD CRM. This includes simulation capability.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FVTS AGS	2.0.0	5.0.0
GSR-400	Provide Continuity of Operations	The JPSS Ground System shall maintain an alternate Management and Operations Node that is functionally identical to the primary Management and Operations node as part of the CBU.	COOP requires designated national assets to remain operational in the event of regional conditions that can impact primary resources (e.g., natural disasters, infrastructure outages, etc.). The JPSS Ground System performs primary operations out of the NSOF. A complete operational backup for all Management and Operations functions will be established at an alternate site. GRAVITE & SDS support is not provided at CBU, and there may be reduced data production.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS AGS	2.0.0	5.0.0

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GSR-3202	Provide Continuity of Operations	The Alternate Data Processing Node (DPN) of the JPSS Ground System shall deliver data to the CLASS Point of Presence (PoP) at CBU.	This requirement addresses interfaces during contingency operations; the CLASS will be served during Contingency.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3203	Provide Continuity of Operations	The Alternate Data Processing Node (DPN) of the JPSS Ground System shall deliver data to the NESDIS ESPC – NDE Point of Presence (PoP) at CBU.	This requirement addresses interfaces during contingency operations; the NDE will be served during Contingency.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3205	Provide Continuity of Operations	The JPSS Ground System shall provide SMD APs to FNMOC Point of Presence at the CBU.	This requirement addresses interfaces during contingency operations; the FNMOC will be served during Contingency.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-3206	Provide Continuity of Operations	The JPSS Ground System shall provide SMD APs to NAVOCEANO Point of Presence at the CBU.	This requirement addresses interfaces during contingency operations; the Naval Oceanographic Office will be served during Contingency.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-1221	Provide Continuity of Operations	The JPSS Ground System shall deploy an alternate Data Processing Node (DPN) with the same capabilities as the primary DPN, as part of the CBU capability to fulfill Continuity of Operations (COOP).	COOP requires designated national assets to remain operational in the event of regional conditions that can impact primary resources (e.g., natural disasters, infrastructure outages, etc.). The JPSS Ground System performing data processing at the alternate DPN must continue to provide operational data products to CLASS, ESPC (NDE) and DoD as required. The alternate DPN interfaces do not include SDS and GRAVITE.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-402	Provide Continuity of Operations	The JPSS Ground System shall transition full operations between the COOP and primary facilities in less than 12 hours.	The system must be able to switch to the COOP location and back to Primary for operations within a maximum time period. This implies the system is fully synchronized prior to the transition between locations.	Performance	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS AGS	2.0.0	5.0.0
GSR-1682	Provide Continuity of Operations	The JPSS Ground System shall provide for configurable data synchronization between the primary and alternate locations.	The end state environment must have the most current data to perform effectively. Includes alternate MON and DPN. Synchronization may occur nominally on a daily basis.	Functional	S-NPP DMSP GCOM-W1 JPSS-1 JPSS-2	CGS AGS	2.0.0	5.0.0

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GSR-1683	Provide Continuity of Operations	The JPSS Ground System alternate Management and Operations Node shall be capable of being remotely configurable from the primary Management and Operations Node.	Operators that may be physically located at the primary facility may need to configure the alternate MON or DPN. Therefore the alternate Management and Operations Node must be remotely configurable.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-1684	Provide Continuity of Operations	The JPSS Ground System alternate Data Processing Node shall be capable of being remotely configurable from the primary Data Processing Node.	Operators that may be physically located at the primary facility may need to execute operations out of the alternate MON or DPN. Therefore the alternate Data Processing Node must be remotely configurable.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1685	Provide Continuity of Operations	The JPSS Ground System alternate Management and Operations Node shall be capable of being remotely operable from the primary Management and Operations Node.	Operators that may be physically located at the primary facility may need to execute operations out of the alternate MON or DPN. Therefore the alternate Management and Operations Node must be remotely configurable.	Functional	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-1686	Provide Continuity of Operations	The JPSS Ground System alternate Data Processing Node shall be capable of being remotely-operable from the primary Data Processing Node.	Operators that may be physically located at the primary facility may need to execute operations out of the alternate MON or DPN. Therefore the alternate Data Processing Node must be remotely configurable.	Functional	S-NPP GCOM-W1 JPSS-1 JPSS-2	CGS	2.0.0	5.0.0
GSR-1687	Provide Continuity of Operations	The JPSS Ground System shall have timely ancillary data at the alternate DPN during COOP conditions.	Ancillary data is required at the COOP site just as it is as the primary location.	Functional	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	5.0.0

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GSR-403	Provide Continuity of Operations	The JPSS Ground System shall support operations out of the COOP facility for at least 30 consecutive days during each COOP event.	The 30-day definition of a long term deployment is consistent with National-level guidance requiring a 30-day operational capability at remote backup sites.	Functional Performance	S-NPP DMSP Metop GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS	2.0.0	5.0.0
GSR-682	Security	The JPSS Ground System shall meet security requirements per NIST 800-53 in accordance with the JPSS Ground System Security Requirements Document (470-00094).	The JPSS ground system implements controls compliant to National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53, Recommended Security Controls for Federal Information Systems and Organizations in accordance with JPSS Program L1RD and FISMA 2002 (1).	Security	S-NPP DMSP Metop Coriolis/WindSat GCOM-W1 JPSS-1 JPSS-2 SCaN NSF	CGS FTS FVTS GRAVITE AGS	2.0.0	5.0.0