

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 21 - Robotic Refueling Mission

Period of Performance: 56 months

Modifications: 4

Task Value: \$40.9M

Scope of Work:

I. Summary of Work

Subtask 1: The contractor will provide management support for this task and ensure that all of the deliverables are met as defined below [REDACTED].

Subtask 2: The contractor will provide operations support including procedure development, review, and verification as well as real-time mission operations support through the end of the Phase 1 portion of the mission. The contractor will provide continued operations, verification and documentation support until all of the RRM Phase 1 hardware has been safely de-orbited from ISS.

Subtask 3: The contractor will provide robotic tool engineering support for the Satellite Servicing Capabilities Office in support of RRM Phase II which is targeting operations on ISS no earlier than April 2015. Responsibilities include: Provide support for on-orbit operations of Phase 2 experiment including; procedure development and verification, mission operations simulations, as well as real-time mission operations support.

Subtask 4: The contractor will provide robotic tool engineering support for the Satellite Servicing Capabilities Office in support of the Preliminary Design Review (Mid 2015) and Critical Design Review (Mid 2016) for RRM 3 payload which is targeting a launch to the Space Station in Fall 2017. Responsibilities include: Design and develop prototype hardware, including tools, tool adaptors, tool boards and cryogenic system to support RRM III PDR and subsequently CDR.

Design and support through CDR, the fabrication and testing of non-flight hardware. Also includes the design, planning and fabrication/procurements for follow-on flight hardware.

Provide all payload related documentation required for individual piece parts /assemblies / Interface Control Documents / Test Plans / End Item Data Packages (EIDPs) / analyses for Tool and Demonstration Technology Development.

Provide support and all payload related documentation required for PDR/CDR and other reviews for Robotic Tools and Technology Development.

Provide Robotic hardware and software support to facilitate the integration of the payload onto the Motoman and Rotopod robotic systems into the Goddard Robotic Technology Development Lab.

Provide required system engineering (and safety and quality assurance support) to ensure hardware development is integrated with all program elements needed for mission success.

Deliverable Items and Schedules

Deliverables for these tasks shall include reports and presentations, design, participation in component, subsystem, and system-level ground tests, etc, and hardware components to integrate with system builds as well as delivery [REDACTED]. Final assembled deliverables will be produced by multi-disciplinary team from multiple contracting sources, and thus not a direct deliverable from this Task. Specific deliverables for this task are monthly progress reports delivered to the Task Monitor and SSCO management on the last Thursday of the month, and presented at the first opportunity following that date.

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 22 - SIDAR System Engineering Support

Period of Performance: 55 months

Modifications: 5

Task Value: \$2.9M

Scope of Work:

I. Summary of Work

The Contractor shall provide experienced Spacecraft Engineering support for all phases of the Solar Irradiance, Data and Rescue (SIDAR) Project; monitor and report progress and conformance to appropriate practices and specifications.

The contractor personnel will be expected to perform / support in the following:

Mechanical Systems Engineering Support and Risk Management

- a) Support in the definition of mission requirements for the project integrating TSIS on the International Space Station
- b) Support in the planning, organizing, scheduling, managing and directing of efforts from procurement, development, fabrication and assembly, integration and test, launch, and on-orbit activation of the TSIS on ISS
- c) Perform duties [REDACTED] Identify risk elements, develop and execute mitigation steps, lead the SIDAR risk board
- d) [REDACTED]
- e) Support in requirements development, flow down, validation and verification
- f) Review trade-studies for TSIS
- g) Prepare interface control documents and verifying proper implementation for instruments
- h) Monitor external interface documentation and requirements
- i) Participate in instruments, subsystems design reviews / meetings and working groups
- j) Review project documentation and submit comments and recommendations
- k) Prepare and present technical information for technical meetings / reviews / briefings
- l) Analyze configuration, design, and procedural changes submitted to change control boards
- m) Prepare and or review hardware and software build and integration plans and procedures, and witness execution
- n) Prepare and or review detailed functional and environmental test plans and procedures for instrument
- o) Analyze test data and provide assessment
- p) Provide comment on contractor schedule and technical performance
- q) Participate in Test / Failure Review Boards
- r) Support "lessons learned" presentations post-launch
- s) Provide written and oral reports [REDACTED]

System Engineering TSIS ISS/ELC Interface Manager

- a) Support the SIDAR team in the development and review of TSIS on ISS documentation including requirements definition, systems engineering documentation, prepare interface control documents and verifying proper implementation for instrument.
- b) Provide Systems Engineering support the SIDAR team in the development of system engineering documentation.
- c) Analyze test data and provide assessment
- d) Provide comment on contractor schedule and technical performance
- e) Support in the launch site checkout, integration and test of flight and ground systems, including adequacy of the launch site facility
- f) Participate in Test / Failure Review Boards
- g) Support "lessons learned" presentations post-launch
- h) Provide written and oral reports [REDACTED]
- i) Support engineering peer reviews, design reviews, safety reviews, system analyses, data flow analysis, and prepare plans.

Instrument System Engineering Management Support

- a) Support the SIDAR team in the development and review of TSIS on ISS documentation including requirements definition, systems engineering documentation, prepare interface control documents and verifying proper implementation for TSIS.
- b) Provide Systems Engineering support to the SIDAR project. Support the SIDAR team in the development of system engineering.
- c) Analyze test data and provide assessment
- d) Provide comment on contractor schedule and technical performance
- e) Support the preparation for shipment of the TSIS and its GSE to the launch site
- f) Participate in Test / Failure Review Boards
- g) Support "lessons learned" presentations post-launch
- h) Provide written and oral reports [REDACTED]
- i) Support engineering peer reviews, design reviews, safety reviews, system analyses, data flow analysis, and prepare plans.
- j) Attend and participate in program status meetings, peer reviews, and major project reviews for ISS, instrument, supply vehicle, mission operations system, and science data system.
- k) Review and provide comments on project, schedule, system, subsystem, software, flight software, safety verification, and testing documentation.
- l) Support in providing responses to and in closing requests for action from major system, subsystem, peer reviews and working groups
- m) Support in the generation, review and response to TSIS waivers and deviations
- n) Support instrument management including support for the design, development and testing of the TSIS and TCTE instruments to observatories. This effort includes systems engineering, risk management, technical management, problem solving, requirements compliance, schedule management, CDRL review, monitoring acceptance testing of TSIS and TCTE, support reviews and Technical interface meetings

Thermal System Engineering Management Support

- a) The Contractor shall provide thermal design and assessment services, including the review of TSIS design, development and analyses of the following:
 - a. Thermal system design
 - b. Component/subassembly/assembly cooling, including electronics and detectors
 - c. Detector cooling design, including detectors, optics, and mechanisms
 - d. Advanced thermal control systems
 - e. Associated instrumentation and control systems
 - f. Thermal analyses compatible with Systems Improved Numerical Differencing Analyzer (SINDA), Thermal Radiation Analyzer System (TRASYS), Thermal Synthesizer Systems (TSS), Finite Element Modeling and Post-processing (FEMAP/TCON), Simplified Space Payload Thermal Analyzer (SSPTA), Thermal Desktop, or Thermal Model Generator (TMG) software packages
 - g. Thermal laboratory support
 - h. Thermal vacuum test support
 - i. Thermal system analysis with ISS interaction with TSIS

- b) Support the SIDAR team in the development and review of TSIS on ISS documentation including requirements definition, systems engineering documentation, review interface control documents and verifying proper implementation for TSIS
- c) Analyze test data and provide assessment
- d) Support the preparation for shipment of the TSIS and its GSE to the mission integrator site
- e) Support in the launch site checkout, integration and test of flight and ground systems, including adequacy of the launch site facility
- f) Participate in Test / Failure Review Boards
- g) Support "lessons learned" presentations post-launch
- h) Provide written and oral reports [REDACTED]
- i) Support engineering peer reviews, design reviews, safety reviews, system analyses, data flow analysis, and prepare plans.
- j) Attend and participate in program status meetings, peer reviews, and major project reviews for spacecraft, instruments, supply vehicle, mission operations system, and science data system.
- k) Review and provide comments on project, schedule, system, subsystem, software, flight software, safety verification, and testing documentation.
- l) Support in providing responses to and in closing requests for action from major system, subsystem, peer reviews and working groups
- m) Monitor acceptance testing of TSIS thermal

Mission Systems Engineering Support

- a) Support the SIDAR team in the development and review of TSIS on ISS documentation including requirements definition, systems engineering documentation, Prepare interface control documents and verifying proper implementation for instruments.
- b) Provide Systems Engineering support to the FFP project (mission, spacecraft, instrument suite, and ground). Support the FFP team in the development of system engineering documentation
- c) Provide Systems Engineering support for Supply and post-launch services, including:
 - a. Payload system and its support equipment
 - b. Interfaces to the mission operations control centers
 - c. Facilitate interfacing with the launch site organization
 - d. Development of launch site support requirements
 - e. Development of launch site plans and procedures
 - f. Shipment of the flight hardware and associated support equipment to and from the launch site
 - g. Services to the supply vehicle team for payload integration to the vehicle at the launch facility
- d) Support in the launch site checkout, integration and test of flight and ground systems, including adequacy of the launch site facility
- e) Participate in Test / Failure Review Boards
- f) Support "lessons learned" presentations post-launch
- g) Provide written and oral reports [REDACTED]
- h) Support engineering peer reviews, design reviews, safety reviews, system analyses, data flow analysis, and prepare plans.

Attitude Control System Engineering

- a) Support the SIDAR team in the development and review of TSIS on ISS documentation including requirements definition, systems engineering documentation, interface control documents
- b) Technical Consultation and Support (Proposals, Peer, Design, and Anomaly Reviews)
- c) Perform engineering tasks for TSIS that include analysis and review of instrument pointing system, Supply Vehicle Dynamics Analysis and Simulation, Control/Structure Interaction Analysis and Simulation Component and Hardware Systems Engineering Specific Task Orders
- d) Review of Advanced GN&C Sensor/Actuator Design, Development, and Test (hardware and/or software) for TSIS
- e) Analyze test data and provide assessment

Subtask 01 DOORS Support

The engineer will be a member of the TSIS Mission Systems Engineering team with the primary responsibilities of: Developing, maintaining, and administering the TSIS DOORS database.

a) Requirements Administrator:

- a. Requirements management support will include the development, maintenance, and administration of a GSFC-resident TSIS DOORS Requirements database and ingest and/or creation of requirement documents, requirement attributes, and linking as deemed appropriate by the customer.
- b. Use DOORS, RPE and other related system engineering software tools for the definition, development and implementation of Level I requirements documents throughout the project lifecycle.
- c. Import and export of documents, data, and engineering data products to/from the database.
- d. Customization of the database for TSIS-unique functions related to requirements tracking and verification.
- e. Collaboration with the subsystem and system engineers on TSIS to determine effective methods for requirements management using the DOORS database.
- f. Coordination with the CM officer to maintain synchronization of the DOORS database and document CM systems
- g. Collaboration with other DOORS systems as appropriate to ensure efficient use and sharing of the DOORS customization data.
- h. Provide technical consultation related to the software products including attending technical discussions and reviews.
- i. Perform "customization" tasks that include the development of processes that result in the desired formatting and manipulating of the requirements data for presentation, displays, and transfer of requirements data between various software packages.
- j. Support and provide requirement traceability and linking analysis between requirements.
- k. Ensure requirement management is GSFC and ISO compliant.
- l. Coordinate all requirement management system upgrades or maintenance on a regular basis and on an ad-hoc basis with the CLM server support team.
- m. Prepare all manuals, procedures, policies, and processes, to support the requirement management effort including training materials. Ensure that system security rules are in place and maintained including maintaining continuous verification with Government representatives regarding system access.
- n. Support TSIS project reviews as appropriate and directed.
- o. Support training and presentations, including conducting classes as needed for TSIS staff in the use of DOORS and the other software tools.

b) Rational Publishing Engine (RPE):

- a. Support the generation of document-style reports from the DOORS requirements management application by creating customized report templates that are based on the IBM® Rational® Publishing Engine (RPE).
- b. Use RPE to create and maintain the customization of report templates to define what data is to be extracted from the data source (queries) and how to format all the information in accordance with NASA GSFC Configuration Management guidelines.
- c. Familiarity with the Representational State Transfer (REST) Application Programming Interface (API) for accessing report information after creation of the customized RPE templates.

c) Verification Engineer:

- a. Support the verification of TSIS by generating and maintaining a requirements verification matrix to provide an audit trail from requirements of the TSIS instrument from design implementation to launch, including key decisions to meet the requirements.
- b. Provide support with exporting and importing data if DOORS is not used for verification on sub-systems.
- c. Work with project management to come up with a process for creating Requirement Verification Reports (RVR). The report will document steps necessary to verify the requirement in question. The Report will cover analysis, test and proper manufacturing or assembly to verify requirement. Train sub-system engineers on process for RVR's for verification and acceptance of verification of requirements.
- d. Review and approve RVR's after submittal to CM system.

Subtask 02 TSIS-2 Systems Engineering Support

The engineer will be a member of the TSIS-2 Systems Engineering team with the primary responsibilities of supplying technical support in studies of TSIS-2 accommodations:

- a) Evaluate [REDACTED] mechanical, electrical, thermal, pointing needs pros and cons on different possible spacecraft, where TSIS-2 is accommodated as mission of opportunity.
- b) Review past studies, interact with Instrument Scientists and scientific community, current TSIS-1 Project staff, and instrument provider. It is possible that interaction with potential spacecraft providers may be required.
- c) Report day to day activity and interim to Mission Manager of TSIS-2. The contractor shall report status to the TSIS-2 project on a monthly basis. No presentation slide is required except for special occasions. The contractor shall report [REDACTED] [REDACTED] on a tri-monthly basis. Reports shall include, [REDACTED], [REDACTED], informal presentation of interim results, and status of development activities.

The contractor shall deliver all documents in electronic document format (PDF or Word) electronic form [REDACTED].

1.2 Travel

In order to perform the task successfully, periodic travel will be required to maintain close communication and interface with the TSIS instrument provider in Bolder CO and International Space Station personnel at Johnson Space Center in Houston TX.

1.3 Deliverables

Deliverables and Schedule (as stated in Task Assignment/SOW)

Deliverable Event/Item	Due
Weekly Status Reports	Each Wednesday by 12pm
Status / Technical Reports	As requested
533 Financial Reports	10 th day after the end of the accounting period
Final Task Report	15 days prior task end date

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 26 - S-NPP Flight Vehicle Simulator (FVS) Sustainment and Operations Support

Period of Performance: 48 months

Modifications: 6

Task Value: \$3.8M

Scope of Work:

The Suomi National Polar-orbiting Partnership (S-NPP) Flight Vehicle Simulator (FVS) Sustainment and Operations Support Team ensures the operations of S-NPP Spacecraft simulator systems, processes, personnel, and procedures and ensures the timely receipt of operational data products. The team supports the S-NPP Mission System (flight and ground) readiness for early orbit, nominal, and contingency operations, and is responsible for post-launch activation, checkout, and calibration of flight and ground systems. Under this task, contractor support of the S-NPP Mission Operations Team is expected in the area of flight vehicle simulator engineering, databases, and other flight related products. Specifically, the team will provide support to the NOAA Satellite Operations Facility (NSOF) located in Suitland, MD, which is co-located with the S-NPP FVS, the NPP operational ground system, and the Flight Operations Team. The team will provide effective coordination with the key ground and personnel resources in support of S-NPP on-orbit operations. The team will provide systems engineering support and testing for delivery of the operational products from the spacecraft and instrument suppliers to Mission Operations.

Specific responsibilities will include:

Flight Vehicle Simulator (FVS) sustainment and maintenance: Evaluate the FVS to ensure operations readiness, recommending updates, maintaining and communicating FVS discrepancy lists, implementing and tracking repairs, and supporting the NASA Joint Polar Satellite System (JPSS) project in implementing changes made by the spacecraft and instrument suppliers, [REDACTED] and others.

Mission operations readiness support: Coordinate simulator script development in support of the mission operations readiness team. Develop simulator nominal setup scenarios; coordinate with [REDACTED] instrument, and JPSS project engineers to define a set of realistic satellite faults which can be injected into the simulator to support mission rehearsal preparation and execution and for developing/testing associated induced anomaly scripts. Plan and support around-the-clock simulator activities, and be responsible for training and certifying backup simulator operators in support of these around-the-clock activities.

Work closely with the NASA JPSS project [REDACTED] to communicate simulator discrepancies found as part of the evaluation and operation readiness activities. Act as the liaison with [REDACTED] the instrument suppliers to coordinate delivery and maintenance of simulator deliverables.

Develop simulator operations documentation and training packages for ensuring the Flight Operations Team is fully trained on all simulator start-up and operations activities. Organize simulator documents at NSOF received [REDACTED] and in-house developed simulator documentation (both electronic and hard copies) delivered to or developed at the NSOF.

Support regression testing to verify that any installation, maintenance, or upgrade does not impact previously-verified functions and performance.

For database support, identify and resolve simulator database discrepancies.

Provide FVS lessons learned and support systems engineering activities in the definition of new JPSS simulator requirements and architecture.

Provide and support FVTS V&V, Write test procedures, develop OPS simulator configuration and setup scripts for various simulator scenarios.

I. Subtask Description

N/A

II. Deliverable Items and Schedules

At a minimum, the contractor shall deliver the items specified below.

<u>Deliverable Title</u>	<u>Due Date</u> # Calendar Days After Award or Relative to Mission Schedule
Task Management Plan	Draft – 15d, Final – 30d
Status / Financial Report	Monthly
Weekly Status Reports	Weekly
S-NPP Simulator Coordination Meeting	As needed
[REDACTED] Spacecraft Simulator Maintenance Meetings	As Needed
Instrument Simulator Maintenance Meetings	As Needed
Simulator Technical Interchange Meetings	As Needed

Work Request Review Panel (WRRP) Meetings	As Needed
S-NPP FVS Discrepancy Review Board (DRB) Meetings	As Needed
Operations and Support (O&S) Configuration Control Board (CCB/ERB) Meetings	As Needed

III. Management Approach

a. Staff Allocation, Expertise, and Skill Mix

The contractor shall have a strong technical base in spacecraft technical information engineering, mission operations engineering, and flight vehicle simulator engineering.

b. Configuration Management

Systems and documents will be covered under the JPSS Ground Project Configuration Management Plan.

c. Facilities

N/A – See Work Location and Security Requirements below

d. Risk Management and Best Practices

The contractor shall manage schedule, cost, and technical risk through monitoring and reporting of progress and performance metrics, identifying issues well in advance of negative consequences, recommending corrective action [REDACTED], and implementing corrective actions [REDACTED].

Specifically, the contractor shall prepare a task management plan describing the technical approach, organizational resources, and management controls to be employed to meet the cost, performance, and schedule requirements throughout task execution.

The contractor shall provide the technical and functional activities at the contract level needed for administrative, clerical, documentation, quality assurance, and related functions.

The contractor shall provide monthly financial reports to document plan versus actual expenditures.

The contractor shall provide weekly status reports describing task performance and identifying any issues.

e. Performance Metrics

The work performed for this task will be evaluated [REDACTED] based on the technical merit. Technical evaluation of the task performance is a subjective combination of performance metrics, technical quality of deliverables, cost control, significant events, innovations, and meeting requirements set forth in the SOW.

f. Government Furnished Facilities, Equipment, Software, and Other Resources

The Government will provide personal computers, account access to government-furnished workstations, office accommodations, and facility support (including phones) at the government work site(s).

Execution of this task may require access to other contractor proprietary information. Company-to-company non-disclosures agreements (NDAs) may be required.

IV. Travel

Travel to CBU for testing, training and supporting in preparation and setup of FVTS.

V. Work Location

This work shall be performed primarily at the NOAA Satellite Operations Facility (NSOF) located in Suitland, MD, and at the Goddard Space Flight Center (GSFC), Greenbelt, MD.

VI. Reporting Requirements

The contractor shall report status in person or via teleconference [REDACTED] [REDACTED] on a monthly basis. Reports shall include informal presentation of interim results, status of development activities, and action item status. The contractor shall provide all reports at least one day in advance of the monthly meeting via email, and maintain an email distribution list with the concurrence [REDACTED]. The contractor shall also support [REDACTED] in the preparation of status reviews for internal and external funding agencies. The contractor shall comply with any and all additional requests for status meetings and reports. The contractor shall deliver all documents in portable document format (PDF) electronic form to the GSFC NMDB online library [REDACTED].

VII. Security Requirements

Execution of this task shall comply with IT security requirements as necessary for performing work at the NSOF and GSFC site facilities. It shall be the contractor's responsibility to complete any NOAA/NASA required security-related training courses. Task members directly involved with activities at secure facilities may require security clearances. The contractor shall coordinate and obtain concurrence [REDACTED] for individuals requiring clearances.

VIII. Rights

REQUIRED: This SOW shall adhere to the RIGHTS IN DATA – special works (FAR 52.227-17) as modified by NFS 1852.227-17. OR

REQUIRED: This SOW shall adhere to the RIGHTS IN DATA – general (FAR 52.227-14) as modified by NFS 1852.227-14, Alternates II and III.

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 28 - JPSS Software Systems Engineering

Period of Performance: 55 months

Modifications: 6

Task Value: \$4.3M

Scope of Work:

I. Summary of Work

- A. The Joint Polar Satellite System (JPSS) Flight Project Flight Software (FSW) Systems Engineering (SE) Group performs acquisition management oversight of the software elements for all JPSS missions (S-NPP, J-1, J-2+, etc.) on behalf of the JPSS Flight Project. The JPSS Software Systems Engineering Support Team, under this task order, provides technical engineering support to the JPSS Flight Project FSW SE Group Lead (a.k.a. the JPSS Flight Software Manager) across all of these elements.

Under this task, the JPSS Software Systems Engineering Support Team supports the software operations of S-NPP (and future JPSS missions) spacecraft and instrument systems, processes, simulators, databases, personnel, and procedures, and ensures the timely receipt of operational data products. The team also supports the JPSS-1 and JPSS-2 Mission System development (flight and ground) and readiness for launch, early orbit, nominal, and contingency operations. The team will provide effective coordination with the key ground personnel and resources in support of on-orbit operations or development activities.

Specific responsibilities will include: Define, formally baseline, and maintain process documentation describing how flight software and table updates are initiated, vetted, implemented, validated, and approved across the various configuration engineering/control boards on the JPSS Ground and Flight Projects.

Conduct a regular Flight Software Working Group (FSWWG) on behalf of the JPSS Software and Simulations Manager to bring together all government and supplier stakeholders to propose and vet technical solutions to resolve on-orbit anomalies or implement and validate new functionality in the flight software and/or related operational products (stored sequences, ground operations procedures, etc.). Tie FSWWG activities to the formal processes for software updates, and to the various configuration engineering/control boards and discrepancy/anomaly review boards on the JPSS Ground and Flight Projects.

Participate in technical reviews of the flight products [REDACTED] [REDACTED] both at the peer review level and formal reviews (for example, requirements reviews, preliminary design reviews, critical design reviews, and test readiness reviews).

Participate in reviews and disposition of analysis generated by IV&V (NASA Independent Verification and Validation) [REDACTED].

[REDACTED] between the Flight and Ground Projects for defining process and technical interfaces, giver/receiver lists, and supplier activity coordination.

Perform other technical activities [REDACTED].

Provide lessons learned for software systems engineering activities across all software, simulator, and database elements of the JPSS Program.

- B. Provide technical review and software systems engineering input for simulator development, deployment, and sustainment activities for the S-NPP Flight Vehicle Simulator and the JPSS Flight Vehicle Test Suite.
- C. Provide technical review, software systems engineering support, anomaly resolution support, database development support, and process improvement analysis for the Command and Telemetry Database (CTDB) activities.

D. Subtask Description

N/A

E. Deliverable Items and Schedules

At a minimum, the contractor shall deliver the items specified below.

<u>Deliverable Title</u>	<u>Due Date</u> # Calendar Days After Award or Relative to Mission Schedule
Status / Financial Report	Monthly

Weekly Status Reports	Weekly
FSWWG Meeting, Minutes, and Actions	As needed
Flight Software and Table Update Process Document	As Needed
Engineering Change Requests (ECRs) and other inputs in response to ERB/CCB/DRB actions	As Needed
Flight to Ground Project Giver/Receiver inputs	As Needed
Database files and "was/is" change documentation for section II. B.	For each scheduled database delivery

F. Management Approach

a. Staff Allocation, Expertise, and Skill Mix

The contractor shall have a strong technical base in spacecraft technical information engineering, mission operations engineering, and software systems engineering, in addition to an appropriate four-year engineering degree.

At a minimum, the personnel shall have the following skills:

- Experience in coordinating stakeholder teams to define engineering interfaces and technical processes
- Hands-on operations experience with software systems for meteorological satellites
- Knowledge of NASA software engineering standards, processes, and best practices
- Mission readiness preparation and post-launch operations experience
- Experience in collaborating with spacecraft and instrument supplier technical personnel to investigate and resolve issues
- Experience in configuration and operations of databases and simulators to support flight operations and ground system development
- Knowledge of systems engineering and integration tools
- Knowledge of flight systems engineering information management
- Experience documenting and reporting discrepancies
- Experience with the definition, implementation, and verification of the SpaceWire communications protocol for instrument communications within JPSS-class spacecraft
- Experience with the definition, implementation, verification, on-orbit installation, and post-installation verification of instrument flight software version updates for S-NPP/JPSS-class spacecraft

- Experience in collaborating with NASA IV&V personnel and Government contractors to evaluate and resolve findings from IV&V analyses relating to S-NPP/JPSS-class spacecraft

b. Configuration Management

Systems and documents will be covered under the JPSS Ground Project Configuration Management Plan.

c. Facilities

N/A – See Work Location and Security Requirements below

d. Risk Management and Best Practices

The contractor shall manage schedule, cost, and technical risk through monitoring and reporting of progress and performance metrics, identifying issues well in advance of negative consequences, recommending corrective action [REDACTED], and implementing corrective actions with the compliance [REDACTED].

Specifically, the contractor shall prepare a task management plan describing the technical approach, organizational resources, and management controls to be employed to meet the cost, performance, and schedule requirements throughout task execution.

The contractor shall provide the technical and functional activities at the contract level needed for administrative, clerical, documentation, quality assurance, and related functions.

The contractor shall provide monthly financial reports to document plan versus actual expenditures.

The contractor shall provide weekly status reports describing task performance and identifying any issues.

e. Performance Metrics

The work performed for this task will be evaluated [REDACTED] based on technical merit. Technical evaluation of the task performance is a subjective combination of performance metrics, technical quality of deliverables, cost control, significant events, innovations, and meeting requirements set forth in the SOW.

f. Government Furnished Facilities, Equipment, Software, and Other Resources

The Government will provide personal computers, account access to government-furnished workstations, office accommodations, and facility support (including phones) at the government work site(s).

Execution of this task may require access to other contractor proprietary information. Company-to-company non-disclosures agreements (NDAs) may be required.

G. Travel

The following non-local travel is anticipated:

- [REDACTED] trips to Gilbert, AZ, to support team meetings and technical interchanges with the JPSS-2 spacecraft and instrument suppliers

- [REDACTED] trips to Boulder, CO, to support team meetings and technical interchanges with the JPSS-1 spacecraft and instrument suppliers

H. Work Location

This work shall be performed primarily at the NOAA Satellite Operations Facility (NSOF) located in Suitland, MD, and at the Goddard Space Flight Center (GSFC), Greenbelt, MD.

I. Reporting Requirements

The contractor shall report status in person or via teleconference [REDACTED] on a monthly basis. Reports shall include informal presentation of interim results, status of development activities, and action item status. The contractor shall provide all reports at least one day in advance of the monthly meeting via email, and maintain an email distribution list with the concurrence [REDACTED]. The contractor shall also support [REDACTED] in the preparation of status reviews for internal and external funding agencies. The contractor shall comply with any and all additional requests for status meetings and reports. The contractor shall deliver all documents in portable document format (PDF) electronic form to the GSFC NMDB online library [REDACTED].

J. Security Requirements

Execution of this task shall comply with IT security requirements as necessary for performing work at the NSOF and GSFC site facilities. It shall be the contractor's responsibility to complete any NOAA/NASA required security-related training courses. Task members directly involved with activities at secure facilities may require security clearances. The contractor shall coordinate and obtain concurrence from the TM for individuals requiring clearances.

K. Rights

This SOW shall adhere to the RIGHTS IN DATA – general (FAR 52.227-14) as modified by NFS 1852.227-14, Alternates II and III.

L. References

JPSS Flight Project Software Acquisition Management Plan (SAMP), 472-00585

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 30 - JPSS Ground Software Support

Period of Performance: 55 months

Modifications: 8

Task Value: \$1.4M

Scope of Work:

I. Summary of Work

- a. Background –The Joint Polar Satellite Systems (JPSS) is a Program managed at the Goddard Space Flight Center in Greenbelt, MD. NOAA is responsible for the JPSS program and is the primary customer. NASA is the program's procurement agent. Data and imagery obtained from JPSS will increase the timeliness, accuracy and cost-effectiveness of public warnings and forecasts of climate and weather events, reducing the potential loss of human life and property. The JPSS Program is a new NASA program, and supports the satellite development, launch, and operations of the NOAA weather satellites. Over the next decade, NASA plans to launch multiple polar orbiting satellites into low earth orbit.
- b. Summary of work – This task provides software engineering support for the Joint Polar Satellite System (JPSS) Ground Project and Code 585 for JPSS Ground Software team.
- c. Specific responsibilities will include:
 - i. Software Process & Standards Support: Evaluates supplier's and in-house development teams' processes against NPR 7150.2A, NASA Software Engineering Requirements; assesses compliance to the software-related GOLD rules; works with JPSS software manager to support software elements with tailoring of requirements to ensure compliance and project efficiency; supports software sustainment and development activities to ensure compliance to applicable processes; identifies, analyzes, tracks and mitigates software-related risks; reviews software deliverables; represents JPSS Ground Software team during Common Ground System software reviews; works with software manager to help software elements establish development metrics; and analyzes supplier software metrics.
 - ii. Software Engineering Technical Support: [REDACTED] for the assigned software element; participates in requirements management activities and provides oversight of requirement verification and validation; participates in reviews of code, test and maintenance activities; reviews

software related documentation and provides technical and process comments; participates in risk analysis and mitigation, as well as mitigation plans; participates in defect analysis, remediation and prioritization; supports in identification of indicators of risk to software element's cost schedule or software quality

II. Deliverables/Schedules/Milestones

<u>Subtask</u>	<u>Deliverables</u>	<u>Due Date</u>
All	Status Reports	Weekly/Bi-weekly
All	Performance Reports	Monthly
All	End-of-task Report	End of task
All	NPR 7150.2A Tailoring Matrices Assessment for each software subsystem and segment	1 months after receipt of NPR 7150.2A Tailoring Matrices from Developer
All	Comments on assigned software element's documentation and/or deliverables	2 days before review deadline in MIS or 1 week after draft delivery, as applicable
All	Report detailing assigned software element's risks, issues, compliance status, and progress from an oversight perspective	Monthly

Management Approach

a. Staff Allocation, Expertise, and Skill Mix:

The contractor shall staff this work item with the appropriate staffing level for the work. At a minimum, the personnel shall have the following skills:

- Expert knowledge of the NPR- 7150.2A and other software reliability standards;
- Knowledge of the Goddard Rules for the Design, Development, and Operation of Flight Systems;
- Knowledge of NASA Software Systems (flight and ground) requirements, architectures, and design and test strategies.
- Working knowledge of NASA's Continuous Risk Management Processes
- Working knowledge of software metrics and analysis strategies
- Working knowledge of NASA's Continuous Risk Management Processes

b. Configuration Management

Systems and documents will be covered under the Program Configuration Management Plan.

c. Facilities

Appropriate IT devices to support the analyses, specification development, and report development are required. It shall be the contractor's responsibility to provide and set up local workstations and network connections at the contractor's off-site facilities as required, and to install any required tools and utilities on the contractor's equipment.

d. Risk Management and Best Practices

The contractor shall manage schedule, cost, and technical risk through monitoring and reporting of progress and performance metrics, identifying issues well in advance of negative consequences, recommending corrective action [REDACTED], and implementing corrective actions with the compliance [REDACTED].

e. Performance Metrics

The work performed for this task will be evaluated [REDACTED] based on the technical merit. The [REDACTED] shall develop detailed performance metrics that shall reflect the contractor's performance in meeting research analysis, specific mission requirements, deliverables and delivery schedule, and the contractor's cost. Technical evaluation of the task performance is a subjective combination of performance metrics, technical quality of deliverables, cost control, significant events, innovations and meeting requirements set forth in the SOW.

Performance metrics for this task shall be:

1. Percent completion of subtask
2. Planned versus actual
3. Delivery dates

f. Government Furnished Facilities, Equipment, Software and Other Resources

The Government will provide account and passwords to government-furnished workstations where existing versions of various relevant software packages shall be maintained. It shall be the contractor's responsibility to complete any GSFC required security-related training courses.

g. Quality Assurance Requirements

The contractor providing technical services shall comply with all CMMI Level 2 processes established for the Project and deliverable products. Applicable requirements include, but not limited to:

1. NPR 7120.5D NASA Space Flight Program and Project Management Requirements
2. NPR 7123.1A NASA Systems Engineering Processes and Requirements
3. GPR 7120.1C Project Management
4. GPR 7120.5A Systems Engineering

ODC (Travel and Procurement)

Labor Categories

<u>Location</u>	<u>Duration</u>	<u>Dates</u>
Aurora, CO		Annually

III. Work Location

This work shall be performed on-site at the Project facility with occasional travel to a contractor facility.

IV. Reporting Requirements

a. Weekly or Bi-weekly status report

The contractor shall generate Performance Reports every week. The report shall include, as a minimum, a summary of the weeks highlights/accomplishments, milestones/schedule/deliverables, risks and customer meetings.

b. Monthly performance report

The contractor shall provide monthly technical and schedule progress reporting to adequately describe the activities of the contractor team [REDACTED]. The contractor shall provide monthly cost reporting in accordance with the WBS. The contractor, including subcontractors, shall be available to attend monthly status meetings.

The contractor shall report status in person or via teleconference [REDACTED] [REDACTED] on a monthly basis. Reports shall include informal presentation of interim results, status of development activities, and action item status. The

contractor shall provide all reports at least one day in advance of the monthly meeting via email, and maintain an email distribution list with the concurrence [REDACTED]. The contractor shall also support [REDACTED] in the preparation of status reviews for internal and external funding agencies. The contractor shall comply with any and all additional requests for status meetings and reports.

V. Security Requirements

The contractor shall comply with Information Technology Security procedures and requirements as defined by NPG 2810.1A in the performance of this task. In addition, the contractor shall comply with all applicable federal rules and regulations and agency directives.

The contractor will not be handling any classified data.

VI. Data Rights

This SOW shall adhere to the following Data Rights clause, as stated in this contract: "the default Data Rights clause under this contract is FAR 52.227-14 RIGHTS IN DATA-GENERAL as modified by NASA FAR Supplement 1852.227-14-Alternate II and Alternate III and GSFC 52.227-90. Any exceptions to this clause will be covered by FAR 52.227-17 RIGHTS IN DATA-SPECIAL WORKS as modified by NASA FAR Supplement 1852.227-17, and, if applicable, GSFC 52-227.93."

VII. Applicable Documents

In the performance of this task, the contractor shall comply with the following documents:

1. NPR 7150.2A NASA Software Engineering Requirements
2. GPR 7150.3 Software Acquisition

VIII. References

None

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 32 - Ammonia Leak Sensor for ISS

Period of Performance: 46.5 months

Modifications: 3

Task Value: \$5.9M

Scope of Work:

I. Summary of Changes in this Task Modification

II. Summary of Work

The purpose of this task is to provide management, engineering, technical support to SSCO to design, develop, test and operate a sensor to detect and isolate ammonia leaks on the International Space Station (ISS). The basis for this task is an urgent requirement from the ISS Program Office and NASA HQ. Therefore the schedule to develop flight hardware for this effort will be highly accelerated.

III. Period of Performance

The original period of performance was November 1, 2012 through April 30, 2013, the period of performance shall be extended through September 30, 2016 to allow for on orbit operations.

IV. Task Description

- a) De-integrate Flight 2 Residual Gas Analyzer (RGA) and replace with spare RGA, complete Functional performance test
- b) Troubleshoot failure of Electron Multiplier in RGA Flight 2 unit
- c) Complete EMI Conducted Emissions testing and Thermal Vacuum testing of Flight 2
- d) Provide required system engineering and safety and quality assurance support to ensure hardware development is integrated with all program elements needed for mission success.
- e) Provide required engineering, analysis, documentation and support for flight/ground safety reviews and safety verifications
- f) Provide on-orbit operations support and analysis of sensor data

V. Deliverable Items and Schedules

Deliverables for these tasks shall include reports, test reports and presentations describing activities conducted by the Ammonia Sensor team including system trade studies, design evaluations and support for the program weekly and monthly reports. Also included is a monthly workforce report, which is delivered [REDACTED]. Deliverables include the above items [REDACTED], all of which will produced by multi-disciplinary team from multiple contracting sources, and thus not a direct deliverable from this Task.

VI. Management Approach

a. Staff Allocation, Expertise, and Skill Mix

The contractor shall staff this work item with the appropriate skill mix and staffing level for the work.

b. Configuration Management

Systems and documents will be covered under the Satellite Servicing Capabilities Office Configuration Management Plan.

c. Facilities

Appropriate Information Technology devices to support the analyses, specification development, and report development are required. It shall be the contractor's responsibility to provide and set up local workstations and network connections at the contractor's off-site facilities as required, and to install any required tools and utilities on the contractor's equipment.

d. Risk Management and Best Practices

The contractor shall manage schedule, cost, and technical risk through monitoring and reporting of progress and performance metrics, identifying issues well in advance of negative consequences, recommending corrective action [REDACTED], and implementing corrective actions with the compliance [REDACTED].

e. Government Furnished Facilities, Equipment, Software and Other Resources

The Government will provide account and passwords to government-furnished workstations where existing versions of various relevant software packages shall be maintained. It shall be the contractor's responsibility to complete any GSFC required security-related training courses.

VII. Travel

Non-local travel may be required for this task.

VIII. Work Location

This work shall be performed primarily on-site at the Goddard Space Flight Center, but the contractor may be required to perform some work at the contractor's facility, and at other NASA/non-NASA facilities.

IX. Reporting Requirements

The contractor shall report status in person or via teleconference [REDACTED] on a weekly basis. Reports shall include informal presentation of interim results, status of development activities, and action item status. The contractor shall provide all reports at least one day in advance of the quarterly meeting via email, and maintain an email distribution list with the concurrence [REDACTED]. The contractor shall also support [REDACTED] in the preparation of status reviews for internal and external funding agencies. The contractor shall comply with any and all additional requests for status meetings and reports. The contractor shall deliver all documents in portable document format (PDF) electronic form [REDACTED].

X. Security Requirements

This task shall comply with the Goddard approved IT security requirements.

XI. Rights

This SOW shall adhere to the RIGHTS IN DATA – special works (FAR 52.227-17) as modified by NFS 1852.227-17.

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 36 - JPSS FVTS Systems Engineering Support

Period of Performance: 52 months

Modifications: 8

Task Value: \$11.9M

Scope of Work:

The Joint Polar Satellite Systems (JPSS) is a Program managed at the Goddard Space Flight Center in Greenbelt, MD. NOAA is responsible for the JPSS program and is the primary customer. NASA is the program's procurement agent. Data and imagery obtained from JPSS will increase the timeliness, accuracy and cost-effectiveness of public warnings and forecasts of climate and weather events, reducing the potential loss of human life and property. The JPSS Program is a new NASA program, and supports the satellite development, launch, and operations of the NOAA weather satellites. Over the next decade, NASA plans to launch multiple polar orbiting satellites into low earth orbit.

This task provides software systems engineering and systems development support for the Joint Polar Satellite System (JPSS) Flight Project and Code 581 for the Flight Vehicle Test Suite Team.

I. Summary of Changes in this Task Modification

Baseline Task Order

The FVTS Team has to manage a multitude of software releases, especially IT/Security patches. The FVTS Team has identified a tool called Puppet (Open Source) that can make our job a whole lot easier and reduce risk.

Supporting the Software Development Team of the JPSS FVTS, the spacecraft simulator flight software system. [REDACTED] work with the development team members to generate and compile the necessary information needed to complete the interface control documents (ICD) and the handbook for the FVTS Simulator Control Subsystem.

The requirements below apply for the additional support requested in this task.

- At least 5- 10 years' experience in development/system engineering of space and ground systems with an emphasis on flight simulators.
- Experience in requirements analysis and generation of interface documentation.
- Knowledge of development, design, lifecycle, data flow and bottlenecks.
- Excellent communication, organization, time management and team skills mandatory.
- Ability to work independently while managing multiple task assignments.

II. Summary of Work

Specific [REDACTED] responsibilities include but are not limited to:

Flight Vehicle Test Suite (FVTS) System Definition, Development, Test & Deployment

- Provide systems engineering and integration, assembly, verification and validation of the JPSS Flight Vehicle Test Suite.
- Establish the baseline Level 3 and Level 4 requirements and ensure an adequate and appropriate flow from Level 2 and 3.
- Responsible for identification and execution of key trades, architecture development, requirements development, verification, and validation.
- Individuals are responsible for overseeing the development of the implementation requirements, design, and coordination with product developers (other contractor/contracts) for delivery of systems components, integration and test planning.
- Design, document and develop safe to mate connector cables for the Engineering Development Unit.

The Simulation Control and Tool Development team:

- Manage technical design, development and execution of Simulator Control Component
- Develop schedules & manage resources for development of Simulator Control Component
- Is responsible for the design, documentation, testing, implementation, and maintenance of the FVTS Simulation Control and Tools.
- Develop display pages for the user interface.
- Develop User's Guide
- Effectively communicate with other developers, engineers, managers, and customers through oral and written communications.
- Hold code reviews to ensure software development best standards are met.
- Conduct test planning and develop test procedures, test scripts
- Conduct Integration planning and check-out activities and execute I&CO program.
- Conduct Verification & Validation planning and execute V&V program.

Additionally, [REDACTED]:

- Work with JPSS Security Group to understand assigned security level and allocated controls for FVTS systems as established by the appropriate NIST, NOAA and NASA Policies.
- Derive FVTS system and subsystem level technical security requirements for inclusion in the FVTS System Specification, ICDs and other system documentation. Ensure the technical requirements are adequate for the system

to meet the non-technical controls imposed upon the JPSS Common Ground System (CGS).

- Assume responsibility for overseeing and/or generating all security specific products that must be developed for the simulator systems.
- Review contractor/vendor generated security products to verify the overall system security architecture will function as required when the system is integrated.
- Assess the security environments for each of the facilities to which a system instance will be deployed and work with facilities Working Group to ensure areas are properly prepared for system deployment.

III. Subtask Description

N/A

IV. Deliverable Items and Schedules

At a minimum, the contractor shall deliver the items specified below.

<u>Deliverable Title</u>	<u>Due Date</u> # Calendar Days After Award or Relative to Mission Schedule
Task Management Plan	Draft – 15d, Final – 30d
Status / Financial Report	Monthly
Weekly Status Reports	Weekly

V. Management Approach

a. Staff Allocation, Expertise, and Skill Mix

The contractor shall have a strong technical base in spacecraft technical information engineering, mission operations engineering, and flight vehicle simulator engineering.

b. Configuration Management

Systems and documents will be covered under the Joint Polar Satellite System (JPSS) Program and Projects Configuration Management Procedure.

c. Facilities

N/A – See Work Location and Security Requirements below

d. Risk Management and Best Practices

The contractor shall manage schedule, cost, and technical risk through monitoring and reporting of progress and performance metrics, identifying issues well in advance of negative consequences, recommending corrective action [REDACTED], and implementing corrective actions with the compliance [REDACTED].

Specifically, the contractor shall prepare a task management plan describing the technical approach, organizational resources, and management controls to be employed to meet the cost, performance, and schedule requirements throughout task execution.

The contractor shall provide the technical and functional activities at the contract level needed for administrative, clerical, documentation, quality assurance, and related functions.

The contractor shall provide monthly financial reports to document plan versus actual expenditures.

The contractor shall provide weekly status reports describing task performance and identifying any issues.

e. Performance Metrics

The [REDACTED] based on the technical merit will evaluate the work performed for this task. Technical evaluation of the task performance is a subjective combination of performance metrics, technical quality of deliverables, cost control, significant events, innovations, and meeting requirements set forth in the SOW.

f. Government Furnished Facilities, Equipment, Software, and Other Resources

The Government will provide personal computers, account access to government-furnished workstations, office accommodations, and facility support (including phones) at the government work site(s).

Execution of this task may require access to other contractor proprietary information. Company-to-company non-disclosure agreements (NDAs) may be required.

VI. Travel

<u>Location</u>	<u>Duration</u>	<u>Dates</u>
Aurora, CO (PMR)	[REDACTED]	6 Times

Vendor Facilities	[REDACTED]	5/Quarter
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VII. Work Location

This work shall be performed primarily on-site at the Goddard Space Flight Center (GSFC), but the contractor may be required to perform some work at the contractor's facility, or from another telecommuting location.

VIII. Reporting Requirements

The contractor shall report status in person or via teleconference [REDACTED] [REDACTED] on a monthly basis. Reports shall include informal presentation of interim results, status of development activities, and action item status. The contractor shall provide all reports at least one day in advance of the monthly meeting via email, and maintain an email distribution list with the concurrence [REDACTED]. The contractor shall also support [REDACTED] in the preparation of status reviews for internal and external funding agencies. The contractor shall comply with any and all additional requests for status meetings and reports. The contractor shall deliver all documents in portable document format (PDF) electronic form to the GSFC NMDB online library [REDACTED].

IX. Security Requirements

Execution of this task shall comply with IT security requirements as necessary for performing work at the NSOF and GSFC site facilities. It shall be the contractor's responsibility to complete any NOAA/NASA required security-related training courses. Task members directly involved with activities at secure facilities may require security clearances. The contractor shall coordinate and obtain concurrence [REDACTED] for individuals requiring clearances.

X. Rights

REQUIRED: This SOW shall adhere to the RIGHTS IN DATA – special works (FAR 52.227-17) as modified by NFS 1852.227-17. OR

REQUIRED: This SOW shall adhere to the RIGHTS IN DATA – general (FAR 52.227-14) as modified by NFS 1852.227-14, Alternates II and III.

XI. References

Joint Polar Satellite System (JPSS) Program and Projects Configuration Management Procedure (470-00012)

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 37 - Strategic Communications Services

Period of Performance: 44 months

Modifications: 4

Task Value: \$802K

Scope of Work:

Support the GSFC overall strategic communications activities and initiatives for Center partnerships and strategic planning in coordination with the Goddard Office of the Chief Technologist (OCT) and the Innovative Technology Partnerships Office (ITPO). Specific activities include the following:

1. Plan and integrate the Center's partnership communications strategy in collaboration with Center management. Develop communications strategy outlining Center priorities and technology development needs in support of GSFC new business development. Align communications with Center and Agency strategic goals and priorities.
2. Perform outreach and coordination with other NASA Centers, industry, academia, and gov't laboratories to identify partnership opportunities and areas of common interest.
3. Work with the Deputy Director for Technology and Research Investments to arrange partnership-related meetings, events, and conferences. Meet with other agencies and organizations to help coordinate and facilitate preliminary partnership discussions. Perform additional partnership communications support activities as needed.
4. Support the collection of information for agreement managers to develop agreements. Provide regular status reporting to the Deputy Director for Technology and Research Investments, the Goddard OCT, and the ITPO of progress, challenges, issues, planned effort, and pending travel.

Contractor shall travel to industry and other agency locations only as absolutely necessary to support partnership planning meetings, and travel must be approved [REDACTED].

Deliverables:

1. White papers on partnership strategies [REDACTED]
2. Partnership meeting reports, addressing meeting minutes, conclusions, recommendations, and future steps based on meeting results (due 5 business days after completion of meeting)
3. Monthly Progress Reports on a) activities performed, b) issues/concerns, and c) planned activities for next month (due by the 15th of each month)

Anticipated Travel: Very limited travel is anticipated, if any.

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 39 - GOES R - Technical Engineering Support

Period of Performance: 48 months

Modifications: 7

Task Value: \$14.8M

Scope of Work:

Background

The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the next generation of geostationary weather satellites, scheduled to launch in 2015. The program is a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite will provide continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It will be the primary tool for the detection and tracking of hurricanes and severe weather and provide new and improved applications and products for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem.

The GOES-R Program is managed by NOAA with an integrated NOAA-NASA program office organization, staffed with personnel from NOAA and NASA and co-located at NASA's Goddard Space Flight Center.

GOES-R is composed of the GOES-R Program Office and two integrated NOAA-NASA project offices: the Flight Project and the Ground Segment Project. The Flight Project oversees the development of the Space Segment, which consists of the spacecraft, the instruments, launch vehicle, and the auxiliary communication payloads. The Ground Segment Project consists of the entire ground system, including the facilities, antenna sites, software and hardware for satellite command and control and to process, create, and distribute end user products, and the Remote Backup facility (RBU).

Scope / Objectives / Requirements

The purpose of this effort is to provide Engineering Support in the form of identification and resolution of issues as well as preparation of plans, briefings, and documents in the areas of systems engineering, strategic planning, requirements assessment, budget planning and data management services for NOAA/NESDIS Geostationary Operational Environmental Satellite GOES R-Series (GOES-R) Program. The contractor shall provide GOES-R specific and similar spacecraft, instrument, and ground expertise and experience to accomplish GOES-R technical and system engineering efforts necessary to plan and implement GOES-R program, flight, and ground segment acquisition, development, integration, launch, deployment, verification and validation, calibration, transition and handover, operations, and sustainment activities.

This task establishes an avenue for the following areas of support:

1. Technical Management Support - The contractor shall provide system engineering and technical management support to program and project management activities including integrated baseline establishment and maintenance, status assessment and reporting of program and project cost, schedule and technical performance, identification, assessment, and management of program and project issues and risks, execution and maintenance of budgets and other programmatic and technical planning and execution activities. Provide program/project control support including budget development and defense, programmatic execution and tracking, and program/project management preparations for internal and external reporting, reviews, and milestone activities. [REDACTED] acquisition strategy development, request for proposal documentation preparations, evaluation and source selection preparation and conduct; evaluation of change proposal materials related to existing procurements, and supporting review and approval materials.
2. Engineering Support – The contractor shall provide program and project technical and system engineering support including mission concept development, requirements management, design solution evaluation and trades analyses, interface management, integration and testing, verification and validation, risk management, technical data and configuration management, technical reviews, requirements compliance, software engineering management, mission assurance, pre- and post-launch calibration, and technical and programmatic oversight.
3. IT Security – The contractor shall provide information assurance support to the design, implementation, and evaluation of all phases of mission security solutions for GOES-R. Conduct security assessments, develop system requirements, and prepare security plans, risk assessments, and security evaluation reports based on NIST, Department of Commerce, NASA, and Department of Homeland Security guidance for critical information technology (IT) systems. Provide support for development of standards, guidance, and policies implemented in the GOES-R System. Provide support for oversight of communications security (COMSEC) requirements and implementation. Support continuous monitoring of all information security, including activities associated with the acquisition and development efforts.
4. Transition to Operations – The contractor shall provide support for the planning, definition, and implementation of the GOES-R transition, mission and data operations, and sustainment activities including participation in mission and data operations engineering roles and execution of the mission and data operations efforts, from pre-launch planning through post-launch operations. Provide operations transition support for the transition of operations from legacy systems to GOES-R. Apply experience with heritage GOES systems and GOES-R design knowledge and expertise to consider all aspects of mission operations, product users, and ground segment resources (e.g., facilities and telecommunications). Develop and coordinate schedules, training and education materials for product users, operators, engineers, and support personnel. Coordinate transition of communications services provided to external interfaces and transition to GRB rebroadcast. Provide support

for the resolution of user transition issues. Provide support for the planning for constellation resource management throughout the initial GOES-R launch and post-launch test period into operations.

5. Instrument Engineering/Calibration – The contractor shall apply senior-level expertise and direct experience with the heritage GOES-I/P Imager to ensure GOES-R instrument performance, operations, and calibration requirements are met. Work with instrument project engineers and vendors to establish and oversee test procedures, integration with the spacecraft, radiometric calibration, instrument interfaces, engineering, and instrument operation procedures. Provide support for technical oversight of instrument data processing algorithm development, including implementation by the ground system. Provide support for assessment of end-to-end instrument performance, from raw measurement to Level 1b product data and Level 2 products.
6. User Systems and Liaison – The contractor shall provide engineering and system engineering support services and work directly with NOAA product data users and National Weather Service (NWS) elements as directed by GOES-R government personnel, to ensure that end user needs are met by the GOES-R system. These efforts shall include support for GOES-R Proving Ground activities, AWIPS-2 technical coordination, and GOES-R data integration. Coordinate, facilitate & participate in development of program data products and techniques and their integration into the GOES-R system. Provide support for the communication of development status to agency leadership, stakeholders, and public; participate in office and program technical interchange meetings/forums. Apply extensive knowledge of meteorological remote sensing, geosynchronous communications approaches, and data production to interpret user needs. Support the acquisition of ancillary data from external elements for use in GOES-R product generation. Assist in refining product distribution requirements and analyze distribution architecture to ensure GOES-R data delivery mechanisms meet user needs.
7. Independent Reviews – The contractor shall provide independent review support including providing senior individuals, unaligned with GOES-R, with extensive space program experience regarding: 1) management and systems engineering of large space system (spacecraft, instruments, and ground segment) acquisition(s) including pre-acquisition, development, integration and test (I&T), launch, and operations and sustainment; 2) executive and congressional program approval and budgeting processes; 3) knowledge of applicable mission and supporting science and user systems; and 4) the supporting external infrastructure and management oversight requirements and processes.

Deliverable/Delivery Schedule

Because of the intermittent nature of these tasks, most specific delivery instructions are often determined on a case-by-case basis, or as specified above. All deliverables shall be presented [REDACTED] in an agreed upon electronic format. Additional structured delivery schedules are as below:

1. Task Management Plan

2. Update organizational documentation relevant to the GOES-R Program. Documents will be updated in draft form as required for GOES-R management and review, editing, and approval.
3. Participate in Technical Interchange Meetings with designated officials and other GOES-R contractors by assessing and reporting programmatic and technical issues to the GOES-R Program Office.
4. Support planning, operation, and evaluation activities as required for GOES-R Program.
5. Provide input, as required, to the development of specifications, funding profiles, and schedule alternatives.
6. Support interface meetings between the spacecraft, ground segment and instrument contractors to reduce implementation risk and ensure verification of all system interfaces.
7. Provide technical assistance to risk reduction efforts, including algorithm development and communications studies.
8. Submit ad hoc verbal briefings and statuses by electronic mail.
9. Submit Monthly Progress Reports, including staff trip reports.
10. Quarterly Financial Report.
11. Final Report, at completion of task order.

Reference Documents

National Security Space Acquisition Policy, dated 23 Mar 2009. Document provided by Government upon request.

ODC (Travel and Procurement)

The contractor shall travel [REDACTED] for the provision of the above support and services, to the Ground Segment sites, GOES-R development contractor locations, and other locations specified for the work.

At minimum, the contractor shall plan for the representative trips listed below in support of the GOES-R during the performance period. Additional travel may be required.

[REDACTED] Travel [REDACTED] 2 trips, [REDACTED], Denver, CO

Security Requirements

The contractor shall comply with Information Technology Security procedures and requirements as defined by NPG 2810.1A in the performance of this task. In addition, the contractor shall comply with all applicable federal rules and regulations and agency directives. Unless otherwise directed, there will be no handling of classified data. However, this task may require the Contractor or its subcontractors to obtain Secret or TS/SCI clearances. If necessary, the requirement will be flowed to Contractor by the Technical Monitor.

Data Rights

This SOW shall adhere to the following Data Rights clause, as stated in this contract: "the default Data Rights clause under this contract is FAR 52.227-14 RIGHTS IN DATA-GENERAL as modified by NASA FAR Supplement 1852.227-14-Alternate II and Alternate III and GSFC 52.227-90. Any exceptions to this clause will be covered by FAR 52.227-17 RIGHTS IN DATA-SPECIAL WORKS as modified by NASA FAR Supplement 1852.227-17, and, if applicable, GSFC 52-227.93."

Government Furnished Equipment/Data

The government shall provide office space at GSFC, necessary office space, desktop computers, telephones, and associated infrastructure, as needed, for individuals if the contractor is working on a Government site. The contractor shall be given access to all information, data, documents, and files in the polar orbiting follow-on program offices that are necessary for the contractor to perform the task.

Place of Performance

All work shall be performed, per the terms of the OMES contract, at GSFC or designated office/travel destinations as needed.

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 40 - GOES-R Project Engineering Services

Period of Performance: 48 months

Modifications: 4

Task Value: \$1.6M

Scope of Work:

1. Engineering Services

1.1 Overview

The contractor will provide engineering management services toward the GOES-R Program and Projects to ensure that assigned objectives are accomplished within the Government's constraints and specifications. Activities will include, but will not be limited to, analysis/assessment of the program schedules and budgets, coordination between NASA and NOAA assignments and responsibilities, and evaluation/insight into prime contractor development efforts.

The contractor will coordinate and support regularly scheduled status meetings, including NASA-NOAA meetings, and provide timely assessments regarding cost, schedule, and programmatic progress. Ad hoc reporting will be based on criticality of the information and on requirements provided by the GOES R Program Office.

The contractor will provide systems management services for program development and ensure programmatic conformance to NASA standard practices and specifications, such as those documented in GPR 7123.1. The contractor will support engineering standards and engineering process work that may include activities such as process generation, engineering standards review, and activities that support engineering process improvement.

Documents/processes that may be reviewed for Program compliance include Operations Concept documents, Design documents, Verification Plans, Interface Control Documents (ICDs), Configuration Management (CM) plans, Risk Management Plans, and SE Management Plans (SEMPs).

The contractor will manage the completion of engineering documents and reports assigned within the GOES-R Program. Activities will include document coordinating, writing, reviewing, and editing based on defined standards.

1.2 Deliverables

Weekly Status Report - by COB Friday, including program status, action item status, pending assignments, issues, and risks.

1.3 Travel

Local travel to spacecraft and instrument contractors and NOAA facilities (NSOF/Suitland, MD and/or Silver Spring, MD) expected, approximately once/month.

2. Broadcast Meteorological Workshop

2.1 Introduction and Background:

The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the next generation of geostationary weather satellites, scheduled to launch in October 2016. The advanced spacecraft and instrument technology used on the GOES-R series will result in more timely and accurate weather forecasts and will impact current users of GOES data products and the volume of data they receive.

The GOES-R Series Program is committed to ensuring user readiness and has a number of key initiatives underway to ensure day-one readiness, maximum utilization of GOES-R products, and an effective transition to operations. GOES-R is engaging users early in the process through Proving Ground and NOAA Test Bed activities, simulated data sets, training, scientific and user conferences, and other communication and outreach efforts.

In support of the GOES-R Program's communication and outreach efforts, a one day workshop for broadcast meteorologists will be held at Cape Canaveral, FL. This workshop will occur two days prior to the scheduled launch of GOES-R and be limited to 15 TV meteorologists. The workshop will cover key aspects of the launch, NOAA's intentions for placing GOES-R into operations. It will also focus on the satellite's functions with emphasis on use of the data in the broadcast environment. An evening reception will be held with key NOAA personnel who will be available for interviews the following day leading up to the launch.

2.2 Scope and Objectives

The GOES-R Program Office requires support contractor support to assist in planning, conducting, and documenting the broadcast meteorologist workshop. The contractor shall provide a team of qualified subject matter experts with the necessary materials, supplies, and equipment in order to complete these requirements. A more detailed breakdown of specific services and deliverables by the contractor are summarized in Section 2 below.

2.3 Deliverables

2.3.1 - The contractor shall be responsible for organizing, producing, and hosting a workshop for an audience of AMS-certified broadcast meteorologists in conjunction with designated NOAA GOES-R Series personnel. This includes working with the GOES-R Series Program to plan the agenda, identify the selected panelists; and working with NOAA and the panelists ahead of time to and plan and coordinate the key discussion topics as well as the overall event dynamic. The contractor shall work with the GOES-R Series Program to develop a final draft agenda and

sketch the plan for the event dynamic no later than 2 weeks prior to the event start. First draft agenda will be drafted and shared with panelists 2 months prior to the event.

2.3.2 - The contractor shall provide all the production expertise, computer technologies, and network connectivity required for professional-quality live streaming of the event for open, unlimited public viewing via the Internet, at a pre-published Web address. The contractor shall provide production and technology expertise both in the planning phase and during the actual event to ensure all the event runs smoothly. This includes ensuring connectivity and functionality of the live streaming. The government expects 100% streaming with no loss of audio or visual signal during the half-day event.

2.3.3 - Provide advance notice of the workshop as appropriate, to include social media and website

2.3.4 - The contractor shall invite and provide invitational travel arrangements to approximately 15 broadcast meteorologists who are able to report live from the meeting. The contractor shall communicate key dates and logistics information as needed for their effective participation. The contractor will invite and confirm the broadcaster's participation at least 60 days prior to the event.

2.3.5 - The contractor shall be responsible for identifying and reserving a host location for the event that meets all of the workshop's space and technological requirements. It should have stage area with podium for speakers and panelists. It should have a large screen and projector, suitable for displaying video and/or PowerPoint information. And there should have microphones with speakers to ensure the audio quality is suitable for both hearing in the room as well as live streaming over the Internet. Thus, the room should also have broadband Internet connectivity, suitable for live streaming of a real-time audio-visual feed.

2.3.6 - The contractor shall work closely with the GOES-R Series Program to develop and maintain the list of selected panelists and participants. The contractor shall extending invitations communicating key dates and logistics information as needed for their effective participation. The contractor will invite and confirm the panelists' participation at least one month prior to the event.

2.3.7 - The contractor shall also provide the following:

- Conduct interviews of NOAA personnel prior to workshop to supply media with content.
- Produce and/or gather and provide video content to the media to support the production of local stories on GOES-R, the launch vehicle and the ground station.
- Provide social media coverage, promotion and buildup, in addition to existing social media coverage from NOAA.
- Plan and produce a LIVE stream of the workshop presentations so all broadcast meteorologists and weathercasters can participate across the nation and around the world.
- Provide web location for video presentations to be archived and viewed after the event.
- Provide options for broadcast meteorologists to cover the GOES-R launch either live or recorded, depending on the actual launch time.

- Schedule as appropriate LIVE broadcast capability from Kennedy Space Center by coordinating with NASA and scheduling satellite trucks (if necessary) to accommodate TV meteorologists that plan to go LIVE the day of the workshop and the day of the launch.
- Executive produce and coordinate all LIVE shots and stories for broadcast meteorologists.

2.3.8 - The contractor shall produce a final video product highlighting the workshop, the launch, and other key events associated with this event. A draft of the final video shall be provided no later than 60 days after the workshop and launch concludes to the points of contact listed in paragraph 3.6 above. After the government's review, a final video is due by January 31, 2017.

2.3.9 - Quarterly Progress Report

2.4 Travel

Launch event travel for 15 geographically dispersed meteorologists, as well as travel in support of appropriate site visits, AMS Broadcaster's meetings and National Weather Service meetings, is required.

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 41 - JPSS Ground Project Mission Security

Period of Performance: 50 months

Modifications: 7

Task Value: \$8.4M

Scope of Work:

NASA is implementing a space-flight mission, formally in partnership with the Integrated Program Office (IPO), to provide data continuity of the Earth Observing System (EOS) Terra and Aqua missions and to prepare for the National Polar-orbiting Operational Environmental Satellite System (NPOESS). The Executive Office of the President (EOP) decision resulted in the NPOESS Program being de-converged. NASA, as the National Oceanographic and Atmospheric Administration (NOAA) implementing agent, is assuming instrument and ground responsibilities for the afternoon orbits. NPP, launched in October 2011, is continuing with ground updates, correction of open pre-launch discrepancies, and addressing operability and open security items and/or augmentations. The new program, identified as Joint Polar Satellite System (JPSS) is responsible for the flight and ground systems, including the development, installation and checkout of the command and control and data processing segments. NASA has assumed the JPSS programmatic, technical and contractual responsibilities for the ground system, including NPP operations. The JPSS Ground Project Office is continuing with the system security engineering task to provide leadership, coordinate the follow-on for the NPP certification and accreditation or renewal activities. This renewal is critical to maintain the operational posture for the NPP mission with a subsequent renewal following the technical performance assessment in a year. NASA is serving as the liaison with agency partners and maintains a cognizance of the ground system security/posture as the security requirements are increasing as standards are continuously evolving. The objectives of the NPP/JPSS missions are:

1. To provide the NASA and the broad Earth science community with the continuation of calibrated, validated, and geo-located global imaging and sounding observations beyond the Terra and Aqua missions, and
2. To serve as the next operational mission providing weather and climate precursor mission to the NPOESS/JPSS program, establishing the operational ground system and validation of instruments and algorithms.

Previous experience with the NPP/JPSS is required. Extensive working knowledge of the NPP/JPSS system requirements, concept of operations, development and mission level architecture and associated Information Technology (IT) security standards and processes for JPSS and agency partners is required.

The NPP satellite consists of the spacecraft [REDACTED] plus five instruments (ATMS, CERES, CrIS, OMPS, and VIIRS) built by various developers. The NPP satellite was launched in

October 2011. NPP orbits in an 824km polar-orbit with a mission life of five years with consumables for seven years. The JPSS 1 mission will be a near clone of the NPP satellite and is targeted for a late 2016 launch date. Geographical diversity requirements will include an additional ground station for NPP operations, and will be included in ongoing security activities.

This task order defines the tasks to execute to execute the security agreements/standards baselined and the activities and review cycles to obtain the various facility/agency consents to operate the JPSS Common Ground System (CGS). Task objectives include:

- Support activities needed to ensure the certification and accreditation (C&A) of JPSS Ground System elements as appropriate, under NIST 800 – 53, FIPS, and NOAA/NASA guidelines; renewal for continuation of the NPP mission support
- Support the JPSS Security Working Group (SWG)
- Support interconnection agreements IAW NIST 800 - 47 and NOAA Guidelines to test/ operate in support of pre-launch mission events based on the JPSS CGS schedule and in coordination with multiple mission stakeholders.
- Maintain the security posture of JPSS CGS post authorization to operate (ATO); identify and coordinate with the CGS contractor actions to maintain security posture.
- Serve as the Project liaison with the NOAA ISSO and the CGS contractor having access to and insight of CGS-related security activities.
- Support mission-level reviews and meetings with various NASA agency partners, NASA agency contractors, and customers.

Technical Requirements

The objective of this task is to lead the IT security effort of the JPSS Ground Project, specifically associated with the CGS, mission system and agency partners for the on-orbit operations of the NPP mission. NASA is responsible for the ground IT security coordination as under the JPSS Program. The task shall coordinate with systems engineering, development, sustainment, and operations activities to develop plans for remediation of the IT security efforts for accreditation renewal of the system (NOAA 5042) and the timeliness of those activities to meet the JPSS CGS and individual mission level reviews for NPP evolution under the Ground System block process. The task includes the leadership of the JPSS SWG and coordinating internally within the JPSS Program and with external agency partners.

The JPSS CGS schedule is provided for reference, and while it is the current plan, it is subject to change based on development and programmatic considerations.

Subtask 1 – Task Management

- a. Provide the technical and functional activities at the contract level needed for administrative, clerical, documentation, quality assurance, and related functions.

- b. Prepare a task management plan describing the technical approach, organizational resources and management controls to be employed to meet the cost, performance and schedule requirements throughout task execution.
- c. Provide monthly financial reports to document plan versus actual expenditures.
- d. Provide weekly status reports describing task performance and identify any issues.

Subtask 2 – NPP Mission System Security Support

- a. Support NPP security activities in maintaining the security posture of the CGS post-accreditation; interaction with various JPSS Program and external partners.
- b. Provide inputs for interconnection agreements with external mission stakeholders to NOAA 5042.
- c. Assess the additional of one or more ground station(s) for NPP on-orbit operations and the associated security posture, accreditation/renewal to operate with those assets.
- d. Actively participate in the planning, development and sustainment activities where functional changes are being made to meet the associated security requirements.
- e. Support JPSS CGS security meetings and working group sessions for NPP issues.
- f. Report security activities status and system posture to the JPSS CGS System Owner.
- g. Assess impact of future missions on the NPP mission operations security posture or impact to NPP ongoing operations; multi-mission support to be evaluated to ensure and/or identify any impact to NPP.

Subtask 3 – Project Security Support

- a. Represent the JPSS Ground Project in security working group meetings.
- b. Participate in management-level and mission-level reviews, meetings, and audits pertaining to security topics.
- c. Travel as appropriate for security-related meetings and activities, and/or training class(es) as approved by the Project and as defined in Section F of this SOW.
- d. Support security activities in maintaining the security posture of the CGS post-accreditation; interaction with various JPSS Program and external partners.
- e. Provide inputs for interconnection agreements with external mission stakeholders to NOAA 5042 boundary.
- f. Perform duties as primary Project point of contact between [REDACTED] and the NOAA NESDIS [REDACTED]; interacts as appropriate with the NOAA NESDIS [REDACTED].
- g. Provide inputs/comments to the JPSS CGS as well as mission specific schedules with respect to security related activities; support to the Operations handover from JPSS Ground Project to NOAA OSPO (upon separation of integration and operational strings).
- h. Coordinate and maintain the currency of test as well as operational interconnection agreements with systems external to the defined security boundaries of the JPSS CGS.
- i. [REDACTED] alternate for interfacing with NOAA and the JPSS CGS contractor to advise on Security controls, changes within the NIST SP 800 guidance for

security and reviews of Ground documents for adherence to NASA and NOAA policy and implementation of the GSSRD.

Subtask 4 – GSFC Security Reviews & Assessments

- a. Review security profile of software and systems for non-JPSS projects that are being developed at GSFC.
- b. Provide security assessment reports from these security assessments.
- c. Overall Key performance requirements will include:
 - Perform an architecture validation review of the Government-specified applications, not to exceed 150 applications at a total of 18,000,000 Lines of Code (LOC);
 - Propose and aid in coordinating a schedule to complete the validation reviews no later than September 30, 2013;
- d. Key performance requirement for each specified application will include:
 - Identify the highest risk modules of software, based on the application architecture and specific code reviews of critical security and availability related functions.
 - Provide a written report that provides a breakdown of the modules into level of risk, from Level 5 – Highest to Level 1 – Lowest.
 - Provide recommendations and alternative mitigation strategies to the identified risks.
 - Technical staff will support management and engineering debrief meetings, following the delivery of the report.
- e. Assumptions for each specified application will include:
 - The technical team will coordinate a teleconference with the application development team to obtain an understanding of the application's functionality, architecture, and other key elements.
 - The Government shall ensure the application development is available to relay technical information regarding the application's functionality and architecture.
 - NDA agreements with vendors may be required. Specific NDA agreements will be determined during the execution of this task.
 - The Government shall provide remote access to designated test systems for purposes of viewing and testing the applications.
 - All Aspect Security staff having access to the application architecture, code, security information, or any other sensitive information related to this task will be U.S. Persons.
 - All Aspect Security staff needing access to the application test platforms shall submit and complete all NASA personnel security enrollment requirements, including a limited background investigation (National Agency Check with Inquiries).
 - The Government team will hold weekly status conference calls with the Aspect Security staff.

Subtask 5 – FVTS System Integrator Support

- a. Support a fast paced FVTS software development environment

- Maintain and manage multiple “build” configurations of multiple software products
 - Support the creation of the Build Instructions for software products
 - Troubleshoot the external products that feed into software products
- b. Track the FVTS requirements for OS and COTS software packages to meet the security requirements of NASA and NOAA.
 - c. Implement and Manage the IT Security controls on the development environment and the delivery systems for FVTS.
 - d. Work with the FVTS hardware and software development team to ensure success in meeting schedule and technical requirements.
 - e. Coordinate and manage a complex set of technical issues, schedules, resources and requirements across a diverse set of vendors, stakeholders, customers and developers associated with FVTS.
 - f. Provide system administrator support for security activities in maintaining the security posture of the FVTS throughout the system design life cycle.
 - g. Perform other FVTS information system and integration support as requested.
 - h. Travel as appropriate for FVTS-related meetings and activities, and/or training classes as approved by the Project.

Assumptions

- The place of performance for all work associated with this task order will be on site at GSFC except for travel as noted in Section of this Task Plan.
- The JPSS CGS schedule is provided for reference, and while it is the current plan, it is subject to change based on development and programmatic considerations.

Applicable Documents

Document	Title	Source
-	GSFC-established QA Procedures	GSFC
	JPSS Ground System Schedule and Technical Baseline	JPSS
	JPSS Ground System Requirements Document	JPSS
	JPSS Common Ground System Requirements Document	JPSS
	JPSS Concept of Operations Document	JPSS
	JPSS Ground System Interface Requirements Documents	JPSS
	JPSS Program System Engineering Management Plan	JPSS
	JPSS Ground System Verification and Validation Strategy Documents	JPSS
	Applicable NPGs and GPGs	NASA/GSFC

Document	Title	Source
	NPR 7120.5D, NASA Space Flight Program and Project Management Requirements	NASA
	NIST FIPS Security Standards	NIST
	NOAA/NASA Security Guidelines	NOAA/NASA
	NSTISSP	NSA

Deliverables

Engineering Document	Due Date
<i>Subtask 1 – Task Management</i>	
Weekly Status Reports	Weekly by Wednesday COB of the following week
<i>Subtask 2 – NPP Mission System Security Support</i>	
Aspect Security Analytical Products: Report detailing review of the CGS software architecture modules containing approximately 4,000,000 LOC. Review will identify, prioritize, and characterize risk areas of the CGS software system.	04/29/13
<i>Subtask 3 – Project Security Support</i>	
Security Status Reports	Periodic
<i>Subtask 4 – GSFC Security Assessments and Reviews</i>	
Aspect Security Weekly Status Report: A weekly status report will be delivered to the [REDACTED] Task Lead. This report will include travel, progress towards milestones, significant findings, issues or risks and short descriptions of plans for the next week.	Weekly by COB Wednesday
Aspect Security Analytical Products: Report detailing review of the GSFC architecture validation review of the Government-specified applications, not to exceed 150 applications at a total of 18,000,000 LOC. Review will identify, prioritize, and characterize risk areas of the GSFC architecture validation review of the Government-specified applications.	09/30/13
<i>Subtask 5 – FVTS System Integrator Support</i>	
FVTS System Integrator Working Group Status	Periodic
FVTS System Integrator Inputs for JPSS/Ground Reviews	As needed
FVTS System Integrator Status Reports	Periodic

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 44 - Mission Operations Support to JPSS Flight Project

Period of Performance: 50 months

Modifications: 6

Task Value: \$25.8M

Scope of Work:

Spacecraft Mission Operations Systems Support

Provide Mission Operations System Engineering support to the JPSS Flight Project particularly in the area of integrated observatory level testing involving the ground system, including but not limited to the following: - I&T for Spacecraft bus subsystems and instrument - Satellite environmental test planning, conduct, and verification - Spacecraft external interface testing - Evaluation of spacecraft operations products (DB, ops products, commissioning) - Evaluation of spacecraft deliverables and givers - Evaluation of spacecraft contract requirement compliance - Spacecraft and observatory special studies / trades - Spacecraft discrepancy and anomaly investigations/resolution - Risk management and waiver review - Spacecraft technical telecons, special topic meetings, TIMS and Monthly Status reviews.

Recurring Travel is Required in Support of Activity approximately 1 trip per month Travel is to be Pre-Approved by Project Travel Locations shall Include, but not be limited to, following locations: 1. Monthly trips to Satellite Provider (Boulder, CO) [REDACTED] 2. Quarterly trips to Instrument Provider (assume Asuza, CA for costing) [REDACTED] Trip Reports in Contractor Format required within seven (7) days of completion of trip.

FVTS Development Support

Provide system engineering and associated discipline engineering support for the development of the Flight Vehicle Test Suite (FVTS) for the JPSS Flight Project. Work will include: 1. Provide management and engineering services to oversee the JPSS instrument FVTS developments. Monitor VIIRS, CrIS, OMPS, and ATMS contractors in execution of each instrument's FVTS build and test. Participate in instrument FVTS progress meetings; design reviews; test readiness reviews; anomaly boards; parts/material boards; etc. Review FVTS verification plans and test procedures. Support in problem resolution. Review test data for FVTS specification compliance. A portion of this work shall be conducted at instrument contractor facilities in El Segundo CA, Boulder CO, Azusa CA, and Ft Wayne IN. 2. Provide management and engineering services to oversee the JPSS Spacecraft Simulator development. Monitor JPSS-1 Spacecraft contractor efforts in support of the SCSIM build and test. Participate in FVTS SCSIM progress meetings; design reviews; test readiness reviews; anomaly boards; parts/material boards; etc. Review FVTS SCSIM verification plans and test procedures. Support in problem resolution. Review test data for FVTS SCSIM specification compliance. A portion of this work shall be conducted at spacecraft contractor facilities in Boulder CO. 3. Provide engineering services to support the

FVTS Integration, Test and deployment activities performed by the JPSS Ground Project's FVTS team, particularly in the area of JPSS-1 simulator design, integration and test.

Recurring Travel is Required in Support of Activity approximately 1 trip per month Travel is to be Pre-Approved by Project Travel Locations shall Include, but not be limited to, following locations: 1. Bimonthly trips to Satellite Provider (Boulder, CO) [REDACTED] 2. Bimonthly trips to Instrument Provider (assume Asuzo, CA for costing) [REDACTED] Trip Reports in Contractor Format required within seven (7) days of completion of trip. NOTE: Detailed Support for Observatory and Instrument Thermal Vacuum testing will be provided in later modification.

Mission Operations Support Team (MOST)

Provide team management, system engineering, and discipline engineering support to the JPSS-1 Mission Operations Support team including but not limited to the following:

- Provide JP-1 spacecraft, instrument and orbital analysis expertise as members of the integrated Mission Operations Systems Team (MOST). This task will provide support in the areas of spacecraft (Bus/Subsystem) analysts, instrument analysts, and orbital analysts.
- Provide cognizance NPP Legacy/Lessons Learned and JPSS engineering developing support for spacecraft subsystems supporting operations including the communication, power, thermal, instruments, image navigation and registration, CD&H, FSW, propulsion, and guidance, navigation, and control subsystems.
- Support mission planning for the JPSS satellites. Specifically, work collaboratively with spacecraft and instrument vendors as appropriate and other JPSS MOT personnel to identify the necessary activities to continue on-orbit operations of the NPP Satellite, merge them into an integrated time-ordered sequence with JPSS development and mission planning activities, and link these sequences with the appropriate procedures to accomplish JPSS Mission planning activities.
- Develop and maintain procedures for nominal operation of the JP-1 observatory, as well as for anomaly response. Specifically, work collaboratively with spacecraft and instrument vendors and other NPP/JPSS MOT personnel to develop, refine, verify, and update (as needed) nominal, operations procedures for the JP-1 spacecraft and instrument suite. These include Recommended Operating Procedures (ROPs), Standard Operating Procedures (SOPs), and machine-executable procedures.
- Develop and maintain procedures to include Command Procedures, Ground System Operating Procedures, Telemetry Display Pages, plot development, test and on-orbit scripts, Contingency Operations Procedures, and Post-Launch Test (PLT) plans and scripts.
- Develop JP-1 Training Plans. Support the development and maintenance of training materials and provide general training on the JP-1 spacecraft and instruments. Consider options for exposure to NPP 'shoulder to shoulder' operational training (with the NPP Operational Flight Analyst team) and best methods for incorporating NPP Lessons Learned into the Training approach.
- Support spacecraft and Ground System Testing: Participate in planning and conducting ground system end-to-end (ETE) tests to send commands and process telemetry, including developing the test plan, generating and validating test scripts, configuring the Ground System, and execution/direction of the test. Support in regression testing and validating changes. Coordinate use of ground system resources. Perform Telemetry and Command Database Validation.
- Participate in, support, and coordinate/Lead where needed, Operations Reviews and Working Groups. Includes but is not limited to support of: Mission Operations Working Groups, Mission Operations Reviews, Flight Operations Review, Simulator Working Group Reviews, Operational Readiness Reviews, External Independent

Readiness Review, Network Operations Working Groups , End-to-End Working Groups, PLT Working Groups, and COP working groups. • Plan and conduct mission simulations, rehearsals and training. • Conduct around-the-clock engineering and mission operations services during launch and early operations and check-out. Provide engineering services in conducting data analysis and trending. • Provide support during calibration/validation and routine operations and science testing.

Provide MOST Team subsystem support.

Recurring Travel is Required in Support of Activity approximately 1 trip per month Travel is to be Pre-Approved by Project Travel Locations shall Include, but not be limited to, following locations: 1. Bimonthly trips to Satellite Provider (Boulder, CO) [REDACTED] 2. Bimonthly trips to Instrument Provider (assume Asuza, CA for costing) [REDACTED] Trip Reports in Contractor Format required within seven (7) days of completion of trip. NOTE: Detailed Support for Observatory JCT testing will be provided in later modification.

FVTS Electrical Harness Development

Provide Electrical Systems Engineering Support: 1) Support in the planning, organizing, scheduling, managing and directing of efforts from fabrication, assembly, and test of the FVTS Electrical harnesses as well as subsequent integration to the FVTS. 2) Participate in FVTS status meetings, telecons, peer reviews, and major FVTS related reviews/meetings. 3) Review project documentation and submit comments and recommendations; 4) Prepare and present technical information for technical meetings / reviews / briefings; 5) Participate in Test / Failure Review Boards for FVTS related hardware.

LEO&A Planning Support

Coordinate and support the development of a post-launch activation, check-out, and validation plan. The plan shall include both spacecraft and instrument activities as well as cover the entire overall schedule for the 90-day JPSS-1 Commissioning Phase. [REDACTED]

Recurring Travel is Required in Support of Activity approximately 1 trip per month Travel is to be Pre-Approved by Project Travel Locations shall Include, but not be limited to, following locations: 1. Monthly trips to Satellite Provider (Boulder, CO) [REDACTED] 2. Quarterly trips to Instrument Provider (assume Asuza, CA for costing) [REDACTED] Trip Reports in Contractor Format required within seven (7) days of completion of trip.

Monthly Report in Contractor Format: 1. Summary of Work Performed during Period (Current Month) 2. Plans for Work for Next Period(s)(Month and Quarter) 3. Summary of Travel/Meeting Support

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 47 - ESTO PM Support

Period of Performance: 48 months

Modifications: 1

Task Value: \$7.5M

Scope of Work:

NASA's Science Mission Directorate (SMD) Earth Science Division (ESD) is responsible for the next generation of Earth science requirements, planning, technology investment, science measurement analysis, and execution. It also includes the collection and dissemination of the data, and support for algorithm and modeling development.

The scope of this work includes activities related to program support for NASA's ESD science efforts towards defining approaches and techniques related to the next generation Earth science technology development, prototypes, and studies of instruments, components, information systems, and flight validations. Specifically this includes support for the Earth Science Technology Office (ESTO). Activities include technology investment portfolio management and gap analyses, technology and programmatic requirements definition, participation in solicitation development and evaluation, and presentation development for ESD instruments and data systems and services. It includes planning, management and coordination activities; database development, technical tools and server support; and resources support, to ensure success. It also includes communication and outreach internally and with other science and technical communities, conferences, and meeting participation.

Program and Project Technical Services

The Earth Science Technology Office (ESTO) provides a cohesive, single point of contact for technology development for the NASA Earth Science Directorate. The ESTO provides all the planning, solicitations, evaluations, awards, administration, and reviews for the ESD technology prototyping development activities in the areas of Information Systems, Instruments, Component technology, and Flight Validation investments and study activities. The ESTO also maintains and updates any and all data related to the ESD technology prototyping program as well as providing outreach and ESD required data. Specifically this includes Project Analysis; Technology Development and Coordination, Cost Data and Project Liaison; Outreach; and Information Systems support.

Project Analysis Includes:

- a. Maintaining technology needs (requirements) assessment;
- b. Performing gap analyses of the investment portfolio against the needs assessment; and
- c. Use of tracking mechanisms to support the analysis and evaluation of all cost, schedule, and technical accomplishments associated with the funded projects of the ESTO Program.

- d. Perform the development, update, maintenance and programming enhancements to the ESTO Technology Portfolio tool. [REDACTED]. This work includes maintenance, conducting an annual update, provide interface portal, perform design, coding, validation and testing, interface, and Web portal and provide ongoing support and periodic maintenance as required.

Technology Development and Coordination Includes:

- a. Provide senior systems expertise and guidance [REDACTED] for the definition, development and implementation of ESTO technology programs, including the Instrument Incubator, Advanced Component Technology, Information Systems Group, and In-space Validation of Earth Science Technologies Programs. The support [REDACTED] will require the compilation and maintenance of tools in support of ESTO technology initiatives. Managing solicitation documentation and version control;
- b. Supporting in the formulation and management of Peer Reviews and Panels;
- c. Supporting in technology development management and preparation of presentation materials;
- d. Preparation of the grants awards packages;
- e. Use of existing tools and development of new tools for technology and proposal evaluation and project administration;
- f. Use of existing tools and, when needed, development of new tools, including development of the ESTO SharePoint site, for program management and coordination;
- g. Use of an existing web-based system for scheduling and participation in project reviews
- h. Requirements development, testing, feedback, training, and use of the redesigned web-based system for project management;
- i. Support the operations, process management, and strategic planning of the ESTO programs and funded projects.

Cost Data and Project [REDACTED] Support Includes:

- a. Provide [REDACTED] expertise [REDACTED] to support in investment decisions in the areas of sensors, detectors, instruments, information systems, and flight validation. In addition, provide evaluations of technical progress in funded technology research projects.
- b. Administrative planning and financial tracking of awarded projects and program metrics;
- c. Develop and manage preliminary project cost estimates, including maintenance of budgetary spreadsheets and tools.
- d. Office administrative planning and support, providing [REDACTED] coordination services for project activities.

Outreach and Documentation Services Includes:

- a. The creation of articles, information posters, brochures, and annual reports highlighting the ESTO projects;

- b. Compiling abstracts, papers, presentations, quad charts, etc., and formatting material for mass CD production and web site inclusion;
- c. Content management, coordination, and display of the NASA -ESTO Outreach Booth and materials at the annual Earth Science Technology Forum (ESTF), American Geophysical Union (AGU), and International Geoscience and Remote Sensing Symposium (IGARSS); American Meteorological Society (AMS) Annual Meeting, and other conferences, workshops, and meetings as participated in by ESTO.
- d. Creation of documentation, technical papers, white papers and library support related to the technology developments.
- e. Web site development, maintenance, and updating.
- f. Awareness and use of evolving digital media communications, such as Twitter.
- g. Coordination with the SMD Chief Technologist on the scheduling, and management of Tech Talks at NASA HQ featuring ESTO funded projects.
- h. Producing the ESTO Visions video to be used in/at conferences, presentations and websites that highlights the future of Earth science technology development. The work includes [REDACTED] script writing, storyboarding, narration, music, illustrations and animations.
- i. Conduct video interviews of ESTO PI's and staff members to be used for web videos, conferences and presentations to highlight and explain the work of ESTO and ESTO projects. This includes lighting, sound, video, editing, graphics, and rendering.

Information Systems Support Includes:

- a. Ensuring the integrity and security of the ESTO network, server operations, and server backup strategy.
- b. Provide system requirements to and maintain coordination with the Information Technology (IT) desktop support contractor.
- c. Work products include IT system announcements and IT Security documentation as required by NASA and GSFC.
- d. Demonstrate a managed cloud services capability for a subset of the AIST awards through a NASA AWS vehicle. This includes system administration, security planning and documentation, and management. It also includes software licenses and customizations for a tool to integrate with AWS to manage the billing and instances of each supported project.

Technology Studies and Integration Support Includes:

- a. Performance of science and engineering analyses necessary to support formulation of solicitations for competed research. These include but are not limited to formulation of Earth Science mission needs, technology surveys and assessments. Technical areas include flight computing, data communications, data management and distribution, applied mathematics and computer science, data analysis and visualization, earth science modeling.
- b. Planning and conduct of technology test and evaluation, infusions, integrations, and other studies to support the overall program goals of advancing the Earth

Science technology capabilities within NASA as related to ESTO funded or planned projects.

The Contractor shall travel and attend meetings, workshops, and training, some trips will be to overseas locations. Specific support will be approved by the government on a case-by-case basis.

Work will be performed both on-site at GSFC and at the prime and any subcontractor facilities. Computer equipment will be provided by GSFC or the contractor as required.

Deliverables:

Monthly Technical Progress Report

Final Task Report

Omnibus Multidiscipline Engineering Services (OMES)

Task Order 48 - JPSS Mission Management and Project Engineering Support

Period of Performance: 38 months

Modifications: 6

Task Value: \$4.9M

Scope of Work:

The Joint Polar Satellite System (JPSS) Ground Project provides mission support capabilities to a heterogeneous constellation of national and international missions including Suomi National Polar-orbiting Partnership (S-NPP), JPSS, European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Observation Program (METOP), Defense Meteorological Satellite Program (DMSP), Japan Aerospace Exploration Agency's (JAXA's) Global Change Observation Mission-Water (GCOM-W), and WindSat/Coriolis. This includes the mission planning and satellite control, satellite data retrieval, routing and pre-processing, data processing and distribution, direct broadcast support, algorithm development and maintenance, on-orbit calibration and validation and long-term trending.

The Ground Project Office established a mission management team to provide mission specific leadership and engineering support to monitor and coordinate mission unique concepts, requirements, implementation and operations. The mission management members will provide leadership between the flight and ground projects, ensuring the needs of each mission are accommodated and tracked from conceptualization, through implementation and with common, optimized manner of meeting the mission requirements. Each mission manager will serve as the focal member following the end-to-end mission unique aspects and facilitating the information and exchange across entities.

This task order defines the tasks to provide mission management for the JPSS missions currently including S-NPP, JPSS-1, JPSS-2 and Japanese Global Change Observation Mission-Water 1 (GCOM-W1). The mission management members will provide leadership/coordination between the JPSS Flight and Ground Project, the NOAA Office of Satellite and Product Operations (OSPO) and the NASA Headquarters Earth Systems Division (ESD), as pertinent, and facilitate coordination with the Common Ground System (CGS) contractor. The mission management role will perform in a manner that provides dedicated tracking and communication to facilitate accommodating unique mission needs. The task members will participate in technical meetings and trades associated with the mission(s) and the unique mission requirements. The mission management members will provide cross cutting communications and ensure information and data exchanges (such as giver/receivers) are met to achieve the implementation and subsequent readiness for launch. As appropriate, the mission managers will also serve to communicate with the data consumers and scientific communities. The mission managers will follow a mission from conceptualization and

development through LEO&A and transition into nominal operations. Support is to be provided as requested for DOD/USAF Space and Missiles Command (SMC) to support in defining their Analysis of Alternatives (AoAs) and future mission needs.

The JPSS mission management task objectives include:

- Establish a mission management charter to support the functional service being provide for a given mission
- Facilitate communication and information exchange between the flight and ground projects; serves as a liaison between the JPSS Projects and between the JPSS Ground Project and, as pertinent, with the USAF Space and Missiles Command (SMC), NASA Headquarters ESD, NOAA organizations and other external entities.
- Monitor giver/receiver needs; identify mission unique data required to support the ground system implementation; track mission specific documentation (including mission requirements, conception of operations, data format control books, etc.) [REDACTED] between the projects
- Serve as the mission point of contact to external data consumers and making recommendations to the Ground Project in support of externals requests/desires
- Serve as a mission knowledgeable source on all aspects of a given mission from end-to-end
- Participation in JPSS, and DOD AOAs [REDACTED]
- Support mission level reviews and meetings with various NASA, agency partners, other Government agencies, agency contractors, and customers.

The JPSS Project Engineering Support task objectives include:

- Prepare Ground Project Weeklies based on input provided by Project team/subject area leads
- Support/Lead the work-off of Project identified issues that require coordination among team/subject area leads
- Support [REDACTED] in meeting mission objectives
- Provide Ground Project Risk Board administration
- Provide coordination of the Ground Project Givers/Receivers, working with Ground Project points of contact to maintain adequate definition, identify driving needs and impacts, and provide regular status tracking.

B. Skill Set / Knowledge Required

The contractor shall have a strong technical base in the following areas:

- Space mission system engineering (mission and flight system)
- Spacecraft, instrument and satellite data and associated formats
- Weather/Earth Science ground data systems, processing and archiving

- Extensive knowledge of the DoD/SMC/DMSP/JPSS and other weather satellite programs. Specifically, knowledge and practical experience and data application for weather, national intelligence, and space operations Security clearance is desired
- Independent review experience (technical and programmatic) for space/weather systems
- Management experience
- Degree in meteorology or computer science is required

At a minimum, the personnel shall have the following skills:

- Earth /weather observing mission system engineering skills
- Knowledge of flight/ground system engineering and integration and data analysis tools
- Knowledge of system integration and mission data formats; test data generation and system propagation
- Task management; strategic mission planning
- Knowledge of instrument design, integration and test
- Strong ability to independently lead and interact with distributed team members and different corporate cultures
- Knowledge of launch and mission operations
- Communication skills to discuss needs and concerns across multiple agencies and organizations

C. Summary of Work to be Performed

The objective of this task is to provide mission management leadership for the JPSS missions as appropriate, including NPP, JPSS-1, JPSS-2, and GCOM-W1. This task includes serving as the point of contact for an assigned mission, where the mission manager is the end-to-end mission expert working within the Ground Project while interfacing with the Flight Project/organizations and external entities. The mission management role, while not responsible for implementation, is to provide a continuous tracking and statusing of the progress of the mission definition, development, mission integration and readiness through LEO&A. The mission management duties include supporting Programs and Project meetings and exchanges and direct interaction with the CGS contractor.

Participation in mission system studies, in concert with the Flight Project organizations, is expected to support the definition of the concept, definition and requirements for JPSS missions.

The task expects to have personnel regularly travel in support of discussions with the primary CGS ground system development contractor, [REDACTED] in Aurora, Colorado. Non-disclosure agreements will be required.

C.1 – Task Management

Provide the technical and functional activities at the contract level needed for administrative, clerical, documentation, quality assurance, and related functions.

Prepare a task management plan describing the technical approach, organizational resources and management controls to be employed to meet the cost, performance and schedule requirements throughout task execution.

Provide monthly financial reports to document plan versus actual expenditures.

Provide weekly status reports describing task performance and mission specific progress and identify any issues.

C.2 – JPSS Mission Management

Generate a mission management plan for each mission describing the overall approach for performing mission management activities to ensure the mission-specific efforts are defined/understood and documented and coordination as a mission liaison is achievable.

Collaborate with the JPSS systems, spacecraft, instrument, ground and operations members in support of maintaining a close and cooperative technical information flow and interpretation of mission unique factors.

Support Flight and Ground Project mission integration working group meetings.

Identify mission unique data required to support ground system upgrade implementations; track mission specific documentation (including mission requirements, conception of operations, data format control books, etc.) [REDACTED] between the JPSS Projects, NASA Headquarters and NOAA OSPO.

Support mission level reviews and meetings with various NASA agency partners (including NOAA), NASA, agency contractors, and customers.

Maintain insight into and provide guidance in the pre-launch readiness activities including but not limited to mission unique verification and test readiness events, test data identification for mission system verification and product performance assessment, validation of operations products and the development of integrated mission timeline.

For the mission operational phase, compile mission data summaries for official and ad hoc reports across the system, including mission performance and mission availability. Develop and maintain system metrics for mission level 1 assessments and annual Joint Steering Group updates. Ensure all planning associated with the longevity of the JPSS missions are coordinated

across all responsible NASA and NOAA leadership. Track day-to-day mission operations to ensure continuity of science data to primary users. Provide [REDACTED] for Command Authorization Meetings where unique mission activities are considered. Ensure all anomalies and deviations from standard operations are reported and tracked through life of mission.

Participate on the various JPSS Ground Project boards (e.g., the Engineering Review Board, the Operational Configuration Control Board, the Discrepancy Review Board, the Algorithm Engineering Review Board) and the Flight Boards as a primary member, and coordinate with specific Working Groups as required.

C.3 – Mission Specific Schedule Monitoring/Statusing

Prepare/track mission specific schedules including flight and ground development milestones, and appropriate mission driving milestones to ensure a representative integrated mission schedule.

Monitor giver/receiver items across the flight and ground projects and between ground developers and externals.

C.4 – JPSS Interactions

Interact with project management regarding mission unique requirements, user needs, issues, constraints, risks, etc. in support of meeting mission objectives.

Facilitate and track coordination by the developers for clarification and/or progress for mission implementation/development in support of mission requirements and operations.

Participate in management and mission level reviews, customer/user meetings and audits, as appropriate, including mission presentations (e.g. Management Status Reviews).

Travel as appropriate, for technical interchange meetings; prepare meeting materials, minutes, recommendations.

C.5 – JPSS Ground Project Engineering Support

Prepare Project Weekly Reports based on input provided by Project team/subject area leads.

Provide Project technical support [REDACTED]. This may involve a lead role to coordinate with multiple Project team/area leads to resolve an issue, or support to another assigned lead.

Support short term special cross-cutting tasks and/or studies [REDACTED].

Provide Mission Manager support [REDACTED].

Provide Ground project Risk Board Administration.

Provide coordination of the Ground Project Givers/Receivers. Work with Ground Project points of contact to maintain adequate definition, identify driving needs and impacts. Provide weekly status tracking and coordinate with Ground Project Schedulers to capture within the Ground Project schedule. Provide weekly summary Giver/Receiver reports to Ground Project and external points of contacts for their awareness of latest status.

D. Deliverables / Milestones

SOW Work Summary Section	Deliverable Title	# Calendar Days After Award
C.1	Task Management Plan	Draft: Award + 15, Final: Award + 30
C.1	Status/Financial Report	Monthly
C.1	Weekly Status/Mission Reports	Weekly
C.2	Mission Management Plan(s)	Award + 30 days; updates [REDACTED]
C.3	Mission Specific Schedule Inputs	Monthly
C.4	Meeting/Review Presentations	Program / Project reviews including; annual S-NPP OSR, pertinent Joint Steering Group Meetings, Ground Project Block 2.0 ORR, March 2016; others [REDACTED]
C.4	Technical and managerial meetings as requested (e.g. Customer user forums, technical interchanges, etc.)	Periodic [REDACTED]
C.5	Ground Project Weekly Reports	Weekly
C.5	White Paper or chart packages pertaining to issue investigations	As necessary

C.5	Giver/Receiver Status reports	Weekly
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E. Other Direct Costs and Special Considerations

E.1 Travel

The following non-local travel is anticipated to support team meetings and other pertinent conferences:

- Average bi-monthly (alternating months) trips to Technical Interchange meetings (TIMs); assume Aurora/Boulder, CO for [REDACTED] (assume 18 trips)
- Average monthly trips to J-2 TIMs and reviews; assume Gilbert, AZ for [REDACTED] (assume 12 trips)
- Customer Forum trips, as agendas warrant; each trip semi-annual for [REDACTED] each (assume 6 trips to AFWA)
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- Yearly trip to Norway for GCOM-W1 (one person for approximately 1 week) (assume spring of each year)

E.2 Materials and Equipment

The place of performance will primarily be at GSFC. Personal computers for on-site personnel will be provided by the JPSS Ground Project. No Government Furnished Equipment is planned.

E.3 Special Considerations

This work may require access to other contractor proprietary information. Company-to-company non-disclosures agreements will be required.

Key task members directly involved with test activities at secure facilities will be required to have / maintain security clearances. The contractor will coordinate and obtain concurrence from the task monitor (TM) for individuals requiring clearances. Additionally, the contractor will be compliant with the NASA security requirements and guidelines.

Interchanges with the various stakeholders may require appropriate agreements and arrangements with JPSS, Japanese Space Agency (JAXA), DOD/USAF and other contractors

and/or international partners. Appropriate arrangements will be required and information exchange will be assessed via the GSFC Export Control Office through the JPSS Ground Project.

Interchanges with the Norwegian Space Centre (NSC) and their contractor, Kongsberg Satellite Services (KSAT) will be required. Appropriate agreements and arrangements will be required and information exchange will be assessed via the GSFC Export Control Office through the JPSS Ground Project. Interchanges with the Japanese may also be required.

F. Applicable Documents

The applicable documents for this task include:

- JPSS Schedule
- JPSS-1 Mission Requirements Specification
- JPSS-2 Mission Requirements Specification
- JPSS System and Operations Concept
- JPSS System Engineering Management Plan
- GCOM-W1 Mission Requirements
- Applicable NPGs and GPGs
- NPR 7120.5, NASA Space Flight Program and Project Management Requirements
- Mission Level Interface Control Documents (ICDs)
- JPSS Level 1 Requirements

G. Applicable Section / Paragraph Number from the OMES SOW for this Task

The applicable OMES SOW sections are as follows:

FUNCTION 3 – IMPLEMENTATION PHASE SERVICES

A. PROJECT MANAGEMENT

B. MISSION SYSTEMS ENGINEERING

C. INSTRUMENT SYSTEMS ENGINEERING