

SECTION C - DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK



National Aeronautics and Space Administration



Johnson Space Center (JSC)
Flight Operations Directorate (FOD)

Statement of Work (SOW)

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Facilities Development and Operations Contract (FDOC)

FDOC

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1. Facilities Development and Operations Contract Overview

The Facilities Development and Operations Contract (FDOC) specifies technical, managerial, and administrative work needed to ensure the availability, integrity, and reliability of mission operations facilities supporting National Aeronautics and Space Administration (NASA) space flight programs requiring mission operations support. The contract is comprised of three parts: Baseline (CLIN-002); Indefinite Delivery, Indefinite Quantity (IDIQ) (CLIN-003); and Level of Effort (LOE) (CLIN-004). For this contract, “facility” is defined as the systems and subsystems of integrated hardware, software, data, and displays used in the preparation for and performance of mission operations. The term “facility” does not refer to “brick and mortar” buildings or building functions, such as lighting, environmental control, and janitorial services. The objective of this contract is to consolidate efforts across the facilities covered under FDOC in order to maximize synergy for hardware and software development, modification, sustaining, maintenance, reconfiguration, and operations for the purpose of reducing cost without compromising facility functionality and performance. This cost reduction may be accomplished by a variety of methods, such as by utilization of similar skills across multiple facilities, combination/elimination of redundant software tools, and implementation of modern system engineering architectures that promote highly efficient design. NASA will collaborate with the Contractor on developing technical and procedural innovations that improve quality, ensure customer satisfaction, and further reduce cost.

Section 1 serves as an information-only introduction to the Statement of Work (SOW).

1.1. Description of Programmatic Support

Mission operations facilities currently support the International Space Station Program (ISSP), including International Partner (IP) and Commercial Visiting Vehicles, the Multi-Purpose Crew Vehicle Program (MPCV), the Space Launch System Program (SLS) and the Commercial Crew Program (CCP). Mission operations facilities supporting these programs are under continuous development in concert with program formulation and implementation. FDOC applies to the facilities for all of these programs, and any other programs requiring mission operations facility support. In addition, future (currently undefined) mission operations facilities and capabilities are within the technical scope of this SOW, and FDOC work associated with these facilities will be enabled through IDIQ.

Mission operations facilities support the following functions:

- **Planning** – Design, analysis, and management of trajectories, use of vehicle systems, and flight and crew activities relative to mission requirements, before, during, and after missions.
- **Training** – Execution of crew, flight controller and instructor training and certification.
- **Flight Operations** – Real-time command and control of vehicle and crew systems involving telemetry monitoring, commanding, analysis, communications, and data distribution and archiving.
- **Reconfiguration** – Data and software inventory management, collection, integration, production, and distribution for the purpose of configuring facilities for flight-specific ground and mission operations.

1.2. Description of Mission Operations Facilities

The following paragraphs describe the mission operations facilities that are within the scope of FDOC.

1.2.1. Mission Control Center Systems (MCCS)**1.2.1.1. Mission Control Center – Houston (MCC-H)**

The Mission Control Center – Houston (MCC-H) is an integrated spacecraft command and control facility capable of supporting multiple space flight programs. The MCC-H provides command, telemetry, trajectory, real-time mission re-planning, weather, video, and voice communication services to support mission operations, flight control team training, and testing. The MCC-H is composed of the following systems and subsystems:

- Command Subsystem
- Communications Subsystem
- External Services Delivery Subsystem
- Facility Management Subsystem
- Infrastructure Hardware Subsystem
- Mission Systems Common Services Subsystem
- Network Subsystem
- Security Subsystem
- Storage Subsystem
- Voice and Video Subsystem
- Orbital Communications Adapter (OCA) Ground System
- The Robotics Planning Facility (RPF)
- ISS MOD Avionics Reconfiguration System (IMARS)
- User Applications (UA) and Supporting Data Files
- Mission Systems Security Center (MSSC) and associated classified facilities

The majority of the MCC-H is physically located at Johnson Space Center (JSC) in the Building 30 Complex. Some MCC-H assets are situated in locations other than the Building 30 complex. Refer to Attachment J-9, Installation Accountable On-Site Government Furnished Property and Attachment J-18, List of Facilities for the locations.

1.2.1.2. Reserved**1.2.1.3. Backup Control Center – Huntsville Operations Support Center (BCC-HOSC)**

The Backup Control Center (BCC) for mission critical systems is located at Marshall Space Flight Center (MSFC) and the BCC for mission support systems is located at White Sands Test Facility (WSTF). These provide backup command and control functions to support ISS operations in case of the loss of command and control capabilities at MCC-H. The Contractor coordinates with the MSFC HOSC and the WSTF for services at these facilities.

1.2.1.4. Reserved**1.2.2. Reserved****1.2.3. Reserved****1.2.4. Training Systems (TS)**

The TS consist of simulators and trainers that support full task and part task training required for crew, flight controller and instructor training. These simulators and trainers operate on different

types of simulator architectures.

The ISS Full Task Trainer (FTT) is located in Building 5S, and is capable of three simultaneous, independent simulation sessions. The Space Station Training Facility (SSTF) is the FTT, and is composed of computing hardware, platform software, special-purpose interface devices, visual image processing, audio communications, mockups of ISS modules, and high fidelity simulation applications. The U.S. modules/systems are integrated with the IP-provided Russian Segment Trainer (RST), the Japanese Experiment Module (JEM) Systems Trainer (JST), and Columbus Trainer – U.S. (COL-TRU). Certain assets, like visual processing and crew station mockups, are allocated in a shared manner to one of the three simultaneous sessions. The FTT is configured to provide generic or mission-specific ISS training. It utilizes actual ISS flight software and specific flight-equivalent hardware, such as the Portable Computer System (PCS) and Robotics Workstation (RWS). The FTT also supports MCC-H testing and ISS Procedure Verification (PV). ISS FTT simulations may be run in a standalone mode, integrated with the MCC-H or Payload Operations Integration Center (POIC) at MSFC (this is commonly referred to as an integrated simulation). The TS Part Task Trainers (PTTs) are located in Buildings 5S and 9 at JSC. These PTTs provide training for crew and flight controllers and instructors with focus on a single vehicle system at a time. Currently the PTTs support limited integration of avionics and system resources (e.g., command and data management, power and thermal conditioning) but will support full-fidelity simulations in the future. Each PTT is composed of a student station, instructor station, simulation computer, and realistic user interfaces like a PCS and Station Support Computer (SSC) laptops. The PTT simulation fidelity is sufficient to support procedure development and analysis, in addition to training. There are six PTTs units, three located in Building 5S and three in building 9 at JSC. One of the PTT rooms in Building 5S is host to a Soyuz trainer consisting of simulation software provided by Russia running on hardware provided by NASA. The PTTs in Building 9 focus on Environmental Control and Life Support System (ECLSS) training for crewmembers in the ISS mockups within the Space Vehicle Mockup Facility (SVMF). In addition, PTT simulation loads are distributed to Russia, Europe, and Japan (and updated at those locations semi-annually) to provide an American Segment Trainer (AST) interface in support of IP training. The TS Flight Controller Part Task Trainers (FCPTT) are located in six rooms on the first floor of Building 5S. Each FCPTT is composed of five flight controller workstations which can also serve as instructor stations. The FCPTT supports single system training and mini-simulation training activities. The TS Robotics Flight Controller Trainer (RFCT) is used to train the ROBO, SYS and TASK flight controller positions, for procedure verification and command script building. The TS Sim City is used for playback simulations, procedure development and visiting vehicle grappling simulations. It has 12 flight controller workstations, an IOS, DVICE keysets and a Robotics Workstation (RWS). The TS Dynamic Skills Trainer (DST) is a robotics trainer focusing on skills required by the crew to operate the ISS Mobile Servicing System (MSS) robotic arm. Each DST has a set of robotics hand controllers, a virtual Display Control Panel (DCP), monitors, a PCS and a SSC.

1.2.5. Reserved

1.2.6. Reserved

1.2.7. Reserved

1.2.8. Integration & Test Environments

The Moderate Integration and Test Environment (MITE) provides an environment for verification and validation of application software targeted for the moderate security Mission Support Operations Environment as well as for integration and validation of external services, and facility operations services.

The High Integration and Test Environment (HITE) provides a high-fidelity environment for verification and validation of platform services, internal services, and application software targeted for the high security Mission Control Operations Environment.

The TS Software Production Environment (SPE) supports integration and testing of simulation loads. The SPE includes simulation host computers, workstations, and associated networks and servers to provide a testing environment equivalent to the operational environment.

1.2.9. Development Environments

The Mission Systems Development Environment (MSDE) environment provides mission and flight analysis, software development integration & test, and sustaining engineering support for all JSC MCCS software. The MSDE will support the Plan, Train and Fly operation in the moderate security environments.

The MSDE provides a set of functional capabilities necessary to establish an environment which facilitates all phases and activities defined within the MCCS application software development lifecycle. These environments will support the non-critical application software developed for the MCCS facility.

The TS Software Development Environment (SDE) supports development, integration and testing of simulation software. The SDE includes simulation host computers, workstations, and associated networks and servers to provide a testing environment equivalent to the operational environment

1.2.10. Operations Technology Facility (OTF)

The Operations Technology Facility (OTF) is located at JSC within the Building 30 Complex. The OTF is a distributed set of hardware platforms used and led by NASA for evaluating and prototyping different technology solutions, conceptual architectures, and operations concepts for mission operations facilities. The OTF supports MCCS, TS and User Applications (UA).

1.2.11. Reserved

2. Contract Management

All scope within this SOW shall be considered baseline (CLIN-002) unless specifically identified as either IDIQ (CLIN-003) or LOE (CLIN-004).

The Contractor shall define and institute consolidated processes to maximize synergy for development, modification, sustaining, maintenance, reconfiguration, and operations across all mission operations facilities, for the purpose of reducing cost without compromising facility functionality and performance as specified via this SOW.

The Contractor shall collaborate with NASA on strategic and innovative solutions for current and future operations and cost reductions that align with the NASA and FOD vision.

The Contractor shall organize and institute integrated processes and tools for managing the products and services specified in this SOW, in accordance with the Integrated Management Plan (DRD-FDOC-0002).

2.1. Financial and Contract Performance

The Contractor shall provide and maintain financial and contract performance management data for the planning, tracking, accumulation, monitoring, contract cost, and contract performance to meet the budgeting, cost reporting, billing, and disclosure requirements of the contract.

The Contractor shall provide integrated financial and contract performance information at individual and assorted contractor work breakdown structure (CWBS) levels (DRD-FDOC-0001, Contract Work Breakdown Structure and Dictionary).

The Contractor shall provide financial management reports (DRD-FDOC-0016, NF533 M/Q Cost Reporting), Wage/Salary and Fringe Benefit Data (DRD-FDOC-0017), Status Reports and Reviews (DRD-FDOC-0012), Workforce Reports (DRD-FDOC-0020), and other business management and administrative reports, as required.

2.1.1. Financial Reporting Form NF533

The Contractor's financial reports shall comply with the most current version of NPR 9501.2, NASA Contractor Financial Management Reporting for procedures and guidelines. The supplemental cost data identified in Section 2.1.2, Customer Cost Report, shall be reconcilable back to the NF533 (DRD-FDOC-0016, NF533 M/Q Cost Reporting) for the same accounting period.

2.1.2. Customer Cost Report

The Contractor shall provide Customer Cost Reporting (DRD-FDOC-0015) that provides full cost information by program and project.

2.1.3. Other Financial Information

The Contractor shall provide financial planning, historical information, technical support information, and support special requests for budget impacts upon NASA request (see Section 2.2, Contract Communications).

The Contractor shall provide and adhere to a Fiscal Year (FY) Operating Plan and Planning, Programming, Budgeting, and Execution (PPBE) (DRD-FDOC-0018) upon request, and a Travel Plan (DRD-FDOC-0019).

2.1.4. Earned Value Measurement (EVM)

The Contractor shall manage and report measurements of technical and schedule performance against an integrated and time-correlated baseline of work and budget in accordance with Earned Value Measurement (EVM) Plan and Reports (DRD-FDOC-0006).

The Contractor shall use an EVM system that:

- Complies with the latest version of DI-MGMT-81466A, Contract Performance Report (CPR).
- Is formally determined to be compliant with DI-MGMT-81466A by a cognizant federal contract management agency (NPR 7120.5, NASA Space Flight Program and Project Management Requirements).
- Is consistent with each applicable facilities schedule (DRD-FDOC-0007, Technical Metrics Plan and Reports).
- Is applicable to discrete and non-discrete elements of this SOW.
 - Refer to Section 3.1.5, Performance Standards, and applicable facility-unique sections for discrete EVM elements.
 - Final determination of discrete and non-discrete elements of this SOW shall be addressed in the Earned Value Measurement (EVM) Plan and Reports (DRD-FDOC-0006).

2.1.5. Information Technology (IT) Plan

The Contractor shall institute processes for information technology (IT) planning and management, as defined by NPD 2800.1, Managing Information Technology for each facility. The Contractor shall comply with Federal and NASA IT planning and reporting regulations and requirements in accordance with Information Technology (IT) Plan and Reports (DRD-FDOC-0010).

2.2. Contract Communications

Formal communications between NASA and the Contractor shall be via use of the Transmittal/Information Request Form (TIRF), JSC Form JF991C. The TIRF will be used for general communications, requests for information, submission of documentation, and as a cover for all technical direction. The TIRF will also be used as a receipt/acknowledgment of and response to direction.

2.2.1. Subcontracts

The Contractor shall institute a plan for small business subcontracting, and provide associated reports, in accordance with the Small Business Subcontracting Plan and Reports (DRD-FDOC-0009).

The Contractor shall perform subcontract administration in accordance with the Integrated Management Plan (DRD-FDOC-0002).

2.2.2. Procurement

The Contractor shall submit all procurement buy lists to the designated NASA quality representative two weeks prior to release of the procurement. The Government will perform Government Source Inspection (GSI) at its discretion. For procurements requiring GSI, see Section 2.11, Quality Assurance (QA).

2.2.3. Organizational Conflict of Interest (OCI)

The Contractor shall institute processes to avoid, neutralize, and mitigate organizational conflicts of interest (OCI) in accordance with the Contractor Organizational Conflicts of Interest (OCI) Plan (DRD-FDOC-0032). See also Attachment J-15, FOD OCI Approach for FDOC.

2.2.4. Associate Contractor Agreements (ACAs)

The Contractor shall establish Associate Contractor Agreements (ACAs) as required by NASA. Reference Section H.9, Associate Contractor Agreement for FDOC Activities. The ACAs shall specifically address all contractor roles, responsibilities, expectations, and a remedy process for problem resolution. Additionally, the Contractor shall enter into ACAs with other contractors who depend on FDOC products to complete timely and quality work for FOD. All ACAs shall be submitted to the FDOC Contracting Officer's Technical Representative (COTR) for acknowledgement.

2.3. Technical Metrics

The Contractor shall derive, institute, and maintain a set of technical performance measures aligned with FDOC functional areas in accordance with Technical Metrics Plan and Reports (DRD-FDOC-0007).

The Contractor shall utilize the technical metrics to formulate technical and managerial strategies and tactics for optimizing work and improving performance.

The Contractor systems for documenting and managing technical measures and tracking associated measurement values shall support electronic exchange of information with NASA as specified in the applicable Data Requirements Descriptions (DRDs).

2.4. Logistics

The Contractor shall provide logistical support (i.e., sparing, shipping, courier services, headset provision and maintenance) to ensure sufficient planning, arrangements, and support for the activities comprising the technical, managerial, and administrative services specified in this SOW.

2.5. Collaboration

The Contractor shall support coordination of technical and schedule information pertaining to FDOC facilities with NASA programs, centers, and affiliated organizations subject to concurrence by the applicable NASA project manager and compliant with OCI provisions in Section 2.2.3, Organization Conflict of Interest (OCI).

2.6. Security

The Contractor shall provide industrial, physical, administrative, information, communications, and IT security in accordance with the Contractor Security Management Plan (DRD-FDOC-0030). The Contractor shall provide, maintain, and adhere to a Facility Security Plan (DRD-FDOC-0031) that describes the security controls put in place for each applicable FDOC facility. The Contractor shall provide security engineering of secure facilities through the implementation of and adherence to NASA and Department of Defense (DoD) regulations governing national security and national resource protection of communications security (COMSEC) equipment. Refer to Attachment J-2, Applicable Documents.

The Contractor shall protect both sensitive (non-classified) and classified information transmitted, processed, or stored by electronic means.

The Contractor shall conduct all IT security training through the System for Administration, Training, and Educational Resources for NASA (SATERN).

The contractor shall obtain National Security Facility Clearance Level (FCL) per clause I.14 Security Classification Requirements NFS 1852.204-75 (SEP 1989) up to TOP SECRET/SENSITIVE COMPARTMENTED INFORMATION (SCI) and as identified by the Government, provide SECRET/TOP SECRET security clearances for personnel supporting

functions identified by NASA as requiring this level of clearance. NASA will sponsor SCI clearances.

2.6.1. Emergency

The Contractor shall institute and implement processes and procedures to ensure emergency preparedness and disaster recovery, in accordance with the Emergency Preparedness and Disaster Recovery Plan (DRD-FDOC-0011).

2.6.2. Information Technology (IT)

The Contractor shall implement an IT security program, in compliance with NPD 2800.1, Managing Information Technology for managing information technology, and in accordance with NPD 2810.1, NASA Information Security Policy for IT security.

The Contractor shall assist with the formulation of and comply with the JSC and FOD IT security programs. The Contractor shall protect sensitive information as well as Privacy Act information, proprietary data, International Traffic in Arms Regulation (ITAR) data and technology embargoed from foreign dissemination, and IP data that is transmitted, stored, or processed in the facilities and systems.

NASA owns the architecture and the requirements as derived from federal, NASA, and FOD-unique mission policies, and is responsible for approving any changes to the facilities architecture and the associated risk accompanying that change. The Contractor shall collaborate with the NASA project manager to identify, assess, quantify, and recommend mitigation for the residual IT security risk in each applicable facility. Where changes to the baseline introduce IT security risks, the NASA project manager and the IT Security manager shall be the deciding officials, including the authority to change or waive the facilities and systems IT security requirement through the configuration management process in Section 2.14, Configuration Management. The NASA project manager and the IT Security manager have the joint responsibility for formally obtaining risk acceptance approvals from the FOD Director.

2.6.3. Export Control

The Contractor shall adhere to export control requirements in NPD 2190.1, NASA Export Control Program and J29W-01, JSC Export Compliance Work Instruction.

2.7. Information Technology Services

The Contractor shall provide FOD office IT support (enhanced support not provided by JSC IT services). This support consists of help desk support 8 hours/day x 5 days/week (Monday – Friday) for office personal computers (PCs) for FOD user and Contractor-installed custom and COTS software tools. The help desk support shall assist with, and provide Directorate-wide coordination of the processing of Information Resources Directorate (IRD) Support Requests (SRs) and the management of file server space for offices and divisions. Office PCs are provided by an IRD contractor, which is responsible for support and asset management of the PC hardware and all standard software. The Contractor shall develop, install, and maintain FOD-unique office applications in accordance with the Change Control Process and Plan (DRD-FDOC-0043). In order to perform this service, the Contractor shall obtain systems administration access for the office PCs from the IRD contractor (which also has systems administration access for standard software support).

The Contractor shall procure, install, administer, and maintain FOD server hardware and software systems providing file, web, database, and print services including both development and production environments.

The Contractor shall provide installation, administration, and operational support for FOD office printers.

2.8. Documentation Management

The Contractor shall manage FDOC documentation to ensure controlled identification, versioning, retention, archiving, and access in accordance with the Records Management Plan (DRD-FDOC-0033).

The Contractor shall provide and maintain an electronic documentation library that is web accessible through the JSC domain and allows downloading of FDOC documents in their native format.

For documents requiring NASA approval (such as Type 1 DRDs and SRs), the Contractor shall accommodate approval via electronic signature, where feasible. For any documents that cannot be approved via electronic signature, the Contractor shall submit for approval to the NASA COTR a plan/schedule to enable that capability.

The Contractor shall accommodate the NASA review and approval cycle described in each Type 1 DRD prior to the Contractor's work effort aligning with or accommodating the specifications for those DRDs.

The Contractor shall deliver DRDs on the date specified in the DRD. However, if the delivery date falls on a weekend or NASA holiday, then the Contractor shall deliver the DRD no later than the next NASA business day.

2.9. Safety and Health Management

The Contractor shall develop, document, implement, and maintain a safety and health program in accordance with JPR 1700.1, JSC Safety and Health Handbook.

In accordance with this safety and health program, the Contractor shall:

- Develop and implement risk management techniques (including risk assessment) to be applied to hazards derived from analyses of activities and products for the purpose of eliminating or controlling hazards as specified in NASA policies and in accordance with requirements for hazard reduction in the Safety and Health Plan (DRD-FDOC-0021).
- On a yearly basis, provide a Safety and Health Program Self-Evaluation (DRD-FDOC-0022).
- Provide Monthly Safety and Health Metrics (DRD-FDOC-0023).
- Implement system safety engineering tasks for flight and institutional program activities and products in accordance with the schedule and applicable flight and institutional requirements as documented in a System Safety Program Plan (DRD-FDOC-0024).
- Provide a Safety Lessons Learned (DRD-FDOC-0029) for each reported safety incident.

The Contractor shall comply with the latest revision of JPD 1710.1, Design, Inspection, and Certification of Pressure Vessels and Pressurized Systems.

2.10. Environmental and Energy Conservation

NASA is the owner and operator of record for all environmental activities conducted at NASA-owned properties, unless otherwise documented in a signed agreement between NASA and the Contractor. The Contractor is advised that activities performed at JSC and associated facilities are subject to federal, state, and local regulatory agency inspections to review compliance with environmental laws and regulations. For on-site issues, JSC's Environmental Office is the single point of contact with federal, state, and local regulatory agencies and their representatives, unless otherwise directed by the Contracting Officer or the Environmental Office.

The Contractor shall ensure that all work performed and equipment used on-site at JSC, Ellington Field, SCTF, and the El Paso Forward Operating Location (EPFOL) to fulfill the requirements of this contract are in compliance with all federal, state, and local regulations and public laws, and the following NASA JSC directives:

- JPD 8500.1, JSC Environmental Excellence Policy
- JPR 8550.1, JSC Environmental Compliance Procedural Requirements
- JPR 8553.1, JSC Environmental Management System (EMS) Manual
- CWI JE9W-06, EMS Aspect/Impact Assessment and EMP Process
- CWI J69W-03, Energy Conservation

The Contractor shall provide data on affirmative procurement, waste reduction activity, energy efficient product procurement, and ozone depleting substances in accordance with Environmental and Energy Consuming Product Compliance Reports (DRD-FDOC-0037). The Contractor shall immediately notify the JSC Environmental Office when contacted by external regulatory agency representatives and shall cooperate fully. The Contractor shall complete, maintain, and make available to the Contracting Officer, JSC Environmental Office, JSC Energy Manager, or regulatory agency personnel all documentation relating to environmental compliance matters under applicable laws. The Contractor shall immediately notify the JSC Environmental Office upon issuance of a notice of violation or non-compliance to the Contractor.

Should a notice of violation, non-compliance, deficiency, or similar regulatory agency notice be issued to NASA as a facility owner/operator on account of the actions or inactions of the Contractor or one of its subcontractors in the performance of work under this contract, the Contractor shall fully cooperate with NASA in correcting any problems and defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

2.11. Quality Assurance (QA)

The Contractor shall establish a quality assurance (QA) program that is compliant with the International Organization for Standardization (ISO) document American Society for Quality Control (ASQC) ISO-9000-2000 – Model for Quality Assurance in Design/Development, Production, Installation, and Servicing.

In order to fulfill this quality program, the Contractor shall:

- Perform hardware and software QA.
- Provide a quality plan for on-site and off-site resources within this contract and implement a true peer review (i.e., QA designee) program as the primary method for all product assurance inspections in accordance with Quality Plan and Reports (DRD-FDOC-0025).
- Collect and compile information derived from Contractor data (e.g., test results, analysis reports, inspection records, discrepancy data, nonconformance data, delivery logs, internal audits, work authorization documents) to demonstrate that the products and services delivered to NASA are in compliance with the requirements and specifications as specified in this contract. The delivery of the compliance information will be at the request of NASA, per the NASA surveillance plan.
- Report non-conformances in accordance with Non-conformance Record Template (DRD-FDOC-0028).
- Share information in accordance with the Government Industry Database for Electronic Parts (GIDEP) and NASA Advisory Problem Data Sharing and Utilization Program Documentation and Reporting (DRD-FDOC-0027).

The Contractor shall have an organizational process that produces Class A software in

accordance with NPR 7150.2, NASA Software Engineering Requirements and JSC-63756, Mission Operations Directorate Software Management Plan.

The Contractor shall submit procurement documents to the designated NASA quality representative for determination of the need for GSI prior to release of the procurement.

Procurements that require GSI shall include the following statements:

“All work on this order is subject to inspection and test by the Government at any time and place. The Government quality representative who has been delegated quality assurance functions on this procurement shall be notified immediately upon receipt of this order. The Government representative shall also be notified 48 hours in advance of the time articles or materials are ready for inspection or test.”

Procurements that do not require GSI shall include the following statement:

“The Government has the right to inspect any or all of the work included in this order at the supplier’s plant.”

NASA dispositions all nonconforming products, except rework to specification. The Contractor shall track and status all anomalies per Section 2.14.3, Technical Problem Process.

The Contractor shall use the Receiving Inspection and Test Facility (RITF) receiving inspection services for metallic and nonmetallic material properties analysis, destructive physical analysis, failure analysis of electronic components, and screen burn-in of electrical and electronic parts and components. The Contractor shall use the RITF training services for initial wire wrap certification.

The Contractor shall maintain and use quality cost data as a management element of the Quality Management System (QMS). The data serve the purpose of identifying the cost of prevention of non-conforming products (e.g., labor and material involved in product defects caused by defective work, correction of defective work, and for quality assurance exercised by the Contractor at the subcontractor’s or vendor’s facility). Quality cost data shall be made available to NASA in accordance with the Quality Plan and Reports (DRD-FDOC-0025).

The Contractor shall conduct internal audits. Process audits shall be performed at the request of the JSC Contracting Officer or the COTR to provide a candid assessment of processes to identify generic system anomalies and areas for improvement.

The Contractor shall calibrate Government and Contractor-owned inspection, measuring, and test equipment in accordance with ISO 10012:2003, Measurement Management Systems – Requirements for Measurement Processes and Measuring Equipment, and ANSI/NC SL Z540-1-1994, Calibration Laboratories and Measuring and Test Equipment.

The Contractor shall develop a software QA plan and provide reports in accordance with the Software Quality Assurance Plan and Reports (DRD-FDOC-0026).

The Contractor shall provide Acceptance Review Packages (DRD-FDOC-0053).

2.12. Risk Management

The Contractor shall institute processes for risk management in compliance with the specifications in NPR 8000.4, Risk Management Procedural Requirements and in accordance with the Risk Management Plan (DRD-FDOC-0003).

2.13. Certification of Flight Readiness (CoFR)

The Contractor shall provide facility integration and operations to ensure mission readiness of the facility to support the FOD Certificate of Flight Readiness (CoFR) process. The Contractor shall provide a Certificate of Flight Readiness Endorsement (DRD-FDOC-0040) for all facilities and user applications for each mission.

2.14. Configuration Management

The Contractor shall institute and document processes for managing the configurations of all FDOC responsible assets (e.g., hardware, software, data, and displays), to ensure controlled identification, versioning, and access, in accordance with the Configuration Management Plan (DRD-FDOC-0044). The Contractor shall provide and update IT information in the NASA Application Tracking Tool (NATT). Additionally, the Contractor shall provide and update IT information for the NASA Data Center and Network worksheets in accordance with Information Technology (IT) Plan and Reports (DRD-FDOC-0010).

2.14.1. Technical Change Management

NASA owns the facility architecture and the requirements (i.e., signature approvals) and is responsible for approving any changes to the facilities architecture or the requirements baseline. Where changes to the baseline introduce tradeoffs between existing facilities requirements or between existing facilities requirements and performance improvements, the applicable NASA project manager will be the deciding official, including the authority to change or waive the facilities requirement, through the configuration management process.

The Contractor shall manage changes and corrections to FDOC products and processes, to ensure tracking, assessment, disposition, and controlled incorporation of proposed changes and corrections that constitute different or corrected facility functionality and performance.

The Contractor shall facilitate user access to the FDOC systems that enable management and tracking of changes and corrections by providing assistance to ensure user familiarity with functionality and administrative processes (e.g., user documentation, help feature, on-call support, etc.).

2.14.2. Technical Change Process

The Contractor shall provide a capability for managing, tracking, and approving technical change requests for all facilities in accordance with the Change Control Process and Plan (DRD-FDOC-0043). The Contractor shall implement all technical changes, referred to as SRs, as dispositioned by NASA.

The Contractor shall provide electronic access to the FDOC technical change management system for authorized NASA personnel and associated contractors. The FDOC change management system shall provide:

- Incorporation of existing SR data for all facilities and systems covered in this SOW.
- Electronic submittal and authorization of change requests.
- Electronic web access to change requests and change request status from a centralized location that does not require an ID or password other than those used for the NDC domain.
- User interface with search criteria fields and selection lists.
- Electronic access control to change request cost impact information.
- Sorting on specified fields.
- Reports generation.

2.14.3. Technical Problem Process

The Contractor shall provide and maintain the capability for the submittal, status, review, ranking, and reporting of anomalies. The Contractor shall provide electronic read and write access to the anomaly data by authorized NASA and contractor personnel. The Contractor shall provide the capability to export the above data in an industry standard format.

The Contractor shall institute processes, procedures, and tools for the identification and

documentation of specific corrections to FDOC products or processes (i.e., Anomaly Reports (ARs)), that are necessary for compliance with functionality and performance requirements, in accordance with the Change Control Process and Plan (DRD-FDOC-0043).

The Contractor shall ensure that operations notes or user notes that document anomalous system behavior visible to the user or work-around measures associated with existing ARs are managed in conjunction with the associated ARs, with assurance of currency.

The Contractor shall provide electronic access by authorized NASA personnel and associated contractors, through the use of the AutoCar system, to the FDOC system for managing technical corrections for the purpose of reviewing, planning, prioritizing, tracking, and measuring corrections for incorporation into deliveries.

The Contractor shall routinely review necessary corrections with NASA by periodically providing a report listing and characterizing the ARs in the technical baseline for each facility, in accordance with Status Reports and Reviews (DRD-FDOC-0012).

The Contractor shall plan corrections in the FDOC correction management system in accordance with NASA-provided guidance.

For ARs, the Contractor shall:

- Take responsibility for the anomaly resolution, including existing anomalies, for all facilities defined in this SOW.
- Track all sustaining and maintenance anomalies of Contractor responsible hardware and software via an AR.
- Manage and track all ARs written on the Contractor responsible hardware and software.
- Respond to ARs based on priority provided by the initiator or NASA project management. AR performance standards for new and existing executable lines of code are defined in Section 3.1.5, Performance Standards.
- Provide facility specific metric and project status reports on AR status for the facilities and systems defined in this SOW.
- Provide users with information as to how to access this reporting system and its data.

For Operational Notes the Contractor shall:

- Take responsibility for all existing Operational Notes for each facility defined in this SOW.
- Track all sustaining and maintenance temporary operational workarounds to ARs of Contractor responsible hardware and software via Operational Notes.
- Manage and track all Operational Notes written on the Contractor responsible hardware and software.

2.14.4. Contract Change Management

The Contractor shall institute processes for managing changes to the contract baselines established on FDOC to enable tracking, assessment, disposition, and controlled incorporation of those changes by both the Contractor and NASA in accordance with the Contract Configuration Management Plan (DRD-FDOC-0004).

2.15. Property

The integrated physical equipment and software that represent the facilities and systems defined in this SOW are classified as Government property.

Attachment J-8, Off-site Government Furnished Property, Part 1 identifies all type 1 “replaceable” off-site Government property provided by NASA for FDOC use off site and to which NASA has title (see Clause G.10, LIST OF GOVERNMENT PROPERTY FURNISHED PURSUANT TO FAR 52.245-1).

Attachment J-8, Off-site Government Furnished Property, Part 2 identifies all type 2 off-site

Government property provided in an “as is, where is” condition for FDOC use off site (see Clause G.11, LIST OF GOVERNMENT PROPERTY FURNISHED PURSUANT TO FAR 52.245-2).

“Contractor-acquired property” means property acquired, fabricated, or otherwise provided by the Contractor as a direct contract charge to NASA for performing a contract, and to which NASA has title (see Clause G.7, INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY).

Attachment J-9, JSC On-site Installation Accountable Property, Part 1 identifies the “replaceable” on-site Government property made available on a no-charge basis for use in performance of FDOC (see Clause G.7, INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY).

Attachment J-9, JSC On-site Installation Accountable Property, Part 2 identifies the “non-replaceable” on-site Government property made available on a no-charge basis to the Contractor for use in performance of FDOC (see Clause G.7, INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY).

Attachment J-9, JSC On-site Installation Accountable Property, Part 3 identifies the on-site installation services made available to the Contractor on a no-charge basis for use in performance of FDOC (see Clause G.7, INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY).

The Contractor shall submit updates to these attachments not later than 30 days after the beginning of each Fiscal Year.

2.15.1. Government Property

The Contractor shall document and maintain FDOC government property management processes and procedures in accordance with the Government Property Management Plan (DRD-FDOC-0008).

The Contractor shall utilize the Government’s property tracking system for FDOC property identified in Attachment J-9 Parts 1 and 2. The Contractor shall provide custodians to input and manage data in the Government’s property tracking system for property provided under this contract. The Contractor shall track and be accountable for FDOC Government property identified in Attachment J-8 Parts 1 and 2, and all contractor-acquired Government property with its own tracking system. The Contractor shall provide reports and inventories in accordance with Property Financial Reporting (FDOC-DRD-0014).

The Contractor shall be the delegated property administrator and shall designate a point-of-contact for FDOC Government property administration and management.

2.15.2. Contractor-Owned Capital Property

The Contractor shall track contractor-owned capital property separately from Government property.

2.16. Equipment Replacement/Obsolescence

The Contractor shall provide and maintain a plan to prevent the obsolescence of deployed and utilized FDOC assets (hardware and software), accounting for all variables that affect the lifetime of assets (e.g., service agreements, component reliability, software licenses, etc.), in accordance with the Equipment Replacement Plan (DRD-FDOC-0048).

The Contractor shall establish delivery plans, estimate resources, and allocate work into the integrated cost, schedule, and technical baselines, for each applicable facility, for the purpose of rectifying or preventing obsolete assets (e.g., non-maintainable equipment), in accordance with Systems Lifecycle Process (DRD-FDOC-0047).

The Contractor shall utilize and comply with the established technical change management

process on FDOC (DRD-FDOC-0043, Change Control Process and Plan) for planning and preparing efforts to rectify or prevent obsolete assets.

The Contractor shall provide and adhere to an annual FY operating plan (DRD-FDOC-0018, Fiscal Year (FY) Operating Plan and Planning, Programming, Budgeting, and Execution (PPBE)) that defines the equipment replacement content for the upcoming FY. All labor and materials for equipment replacement are in the contract baseline.

Contractor-owned capital property that enables the Contractor to provide maintenance and sustaining services remains the responsibility of the Contractor to provide and replace within their own equipment replacement plan and shall remain the property of the Contractor.

3. Facilities Support

The Contractor shall manage, develop, modify, maintain, sustain, and operate all facilities and supporting functions defined in this SOW. The Contractor shall also ensure the availability, integrity, and reliability of these facilities.

This facility support is categorized as Common Facilities Support, Unique Facilities Support, and Facility Engineering and Support Services.

3.1. Common Facilities Support

Common facilities support is applicable to all facilities and consists of management, system engineering, development, modification, maintenance, sustaining engineering, operations, facility operations, decommissioning, reconfiguration, facility resource scheduling, performance standards, test and checkout, interface support, certification, training, travel, reports, and requirements documentation. The Contractor shall provide and adhere to a Systems Lifecycle Process (DRD-FDOC-0047).

The Contractor shall coordinate with JSC's COD for installation-provided services (e.g., power, heating, ventilation, air conditioning, and safety controls), and plant engineering and operations in accordance with requirements documents, including JSC-27049, Memorandum of Understanding and Standard Interface Plan between Center Operations Directorate and Mission Operations Directorate.

The Contractor shall coordinate with JSC's Information Resources Directorate (IRD) for services in accordance with the Memorandum Of Understanding (MOU) and Service Level Agreement (SLA) between IRD and Mission Operations Directorate. The Contractor shall be responsible for technical power distribution (as defined in JSC-27049) within each facility and for coordinating with plant engineering and operations to ensure proper environmental control for personnel and equipment.

The Contractor shall adhere to the standards and processes specified in JSC-63756, Mission Operations Directorate Software Management Plan for all FOD software and supporting data files. For new or modified software and supporting data files to meet new requirements and are not compliant with the FOD SMP guidelines regarding software and supporting data files, the Contractor shall be responsible for requesting Mission Systems Review Board (MSRB) approval to grant waivers to the FOD SMP guidelines. For existing software and supporting data files that are currently in sustaining, the MSRB assumes the SMP documentation is adequate until such time that the software is modified to meet new requirements or it is deemed inadequate due to the needs of another project, at which time its adequacy shall be re-evaluated for compliance to the SMP.

3.1.1. Management

The Contractor shall manage the facilities covered by FDOC. The Contractor shall coordinate and integrate minor building upkeep to keep each building in showcase condition and shall at

times perform minor building upkeep such as carpet installation, replacement, and cleaning. The Contractor shall provide management and control of the facility hardware, software and data configurations for the purpose of ensuring the facilities are ready to support the flight manifest.

The Contractor shall adhere to the latest revision of JSC-64052, Facility Management Plan. The Contractor shall provide configuration management and documentation maintenance of the NASA-owned facility architecture baselines and requirements.

The Contractor shall manage the integration of NASA-provided flight hardware and software into the facilities as needed.

The Contractor shall provide and adhere to a Software Standards, Development, and Configuration Management Plan (DRD-FDOC-0057).

The Contractor shall provide software source code and supporting data files to NASA per Software Documentation Delivery (DRD-FDOC-0062).

3.1.2. Development, Modification, and Systems Engineering

NASA will determine all facility requirements. The Contractor shall implement NASA-approved requirements for development and modification changes. The Contractor shall develop and modify, as needed, the documentation of these requirements in the facility Level A and B Requirements (DRD-FDOC-0045).

The Contractor shall provide and adhere to an annual FY operating plan (DRD-FDOC-0018, Fiscal Year (FY) Operating Plan and Planning, Programming, Budgeting, and Execution (PPBE)) that defines the development and modification content, taking into account the NASA-provided technical, managerial, budget, and resource expectations.

The Contractor shall provide systems engineering, development engineering, modification engineering, and service integration of COTS, GFP, and custom solutions for all facilities defined in this SOW. The Contractor shall provide systems engineering in compliance with NPR 7123.1, NASA Systems Engineering Processes and Requirements.

The Contractor shall provide systems engineering support of development and modification requests (of hardware and software) through the change process defined in Section 2.14.2, Technical Change Process. The Contractor shall also utilize this change process to obtain NASA approval for development and modification. The Contractor shall procure/develop all hardware and software for development and modification unless otherwise specified through the change mechanism.

The Contractor shall provide support for technical analyses, cost assessments, “make/buy” decisions, and other specific activities necessary to accomplish development, modification, and systems engineering. The Contractor shall develop and modify, as needed, the Interface Control Documents (ICD) and Interface Definition Documents (IDD) (DRD-FDOC-0046) and the Design Specifications (DRD-FDOC-0055).

The Contractor shall provide Design Review(s) (DRD-FDOC-0054) for approved development and modification changes and shall incorporate approved changes to the facility architecture in the Design Specification (DRD-FDOC-0055).

Performance standards for the response to NASA-driven development and modification requests are defined in Section 3.1.5, Performance Standards.

For all software tool integration, interface changes, and integration/delivery of development and modification, the Contractor shall coordinate the scheduling and impact of the change with the facility directly affected by the change, the applicable NASA project manager, and the user representatives of the affected facility.

The Contractor shall perform operational analysis, system engineering, verification testing (per the Test and Checkout sections of this SOW), and provide sustaining engineering for all development and modification.

The Contractor shall provide delivery of development and modifications as identified in the applicable unique facility support sections of this SOW.

The deliveries may bundle several systems/subsystems or remain as an individual delivery (whichever is most efficient) per the Systems Lifecycle Process (DRD-FDOC-0047) upon successful test completion. The Contractor shall release all other development and modifications as independent deliveries.

The Contractor shall provide and maintain an integrated project schedule for each facility that identifies all hardware, software, data, and displays planned for each delivery. The applicable NASA project manager approves the schedule, content, and delivery dates.

The Contractor shall deliver an Acceptance Review Package (DRD-FDOC-0053).

The Contractor shall provide a Software Development Folder (DRD-FDOC-0059) for each application developed or modified. The Contractor shall deliver new software to IPs and HSG sites as required.

3.1.3. Maintenance and Sustaining Engineering

The Contractor shall provide and adhere to an annual FY operating plan (DRD-FDOC-0018, Fiscal Year (FY) Operating Plan and Planning, Programming, Budgeting, and Execution (PPBE)) that defines the maintenance and sustaining engineering content, taking into account the NASA-provided technical, managerial, budget, and resource expectations.

The Contractor shall perform maintenance and sustaining engineering of the facility per the configuration management process defined in Section 2.14, Configuration Management. Facilities may contain COTS, GFP, and custom hardware and software. The Contractor shall provide facility availability and reliability as specified in the requirements and in the applicable facility section for Performance Standards.

The Contractor shall maintain the documentation for the facility Level A and B Requirements (DRD-FDOC-0045), the Interface Control Documents (DRD-FDOC-0046), and the Design Specifications (DRD-FDOC-0055).

The Contractor, in performance of maintenance and sustaining engineering, shall:

- Ensure ready availability of spares.
- Manage maintenance agreements with hardware and software suppliers.
- Manage software licenses.
- Resolve and correct hardware and software anomalies.
- Perform preventative maintenance.
- Calibrate test equipment per Section 2.11, Quality Assurance (QA).

The Contractor shall support the installation of new equipment and interface cabling, removal of obsolete equipment and cabling, and the equipment replacement (Section 2.16, Equipment Replacement/Obsolescence) for each facility.

The Contractor shall perform operational analysis, system engineering, and verification testing (per the Test and Checkout sections of the SOW) for sustaining engineering changes.

The Contractor shall provide delivery of sustaining content as specified in the applicable unique facility support sections of this SOW.

The deliveries may bundle several systems/subsystems or remain as an individual delivery (whichever is most efficient) per the Systems Lifecycle Process (DRD-FDOC-0047) upon successful test completion. The Contractor shall release all other sustaining content as independent deliveries.

The Contractor shall provide and maintain an integrated schedule for each facility that identifies all hardware, software, data, and displays planned for each delivery. The applicable NASA project manager approves the schedule, content, and delivery dates.

The Contractor shall deliver an Acceptance Review Package (DRD-FDOC-0053).

The Contractor shall update the Software Development Folder (DRD-FDOC-0059) for the maintenance and sustaining engineering of each application. The Contractor shall deliver updated software to IPs and HSG sites as required.

3.1.4. Facility Operations

The Contractor shall provide facility operations support consistent with the applicable unique facility operations support requirements sections.

The Contractor shall provide generalized facility operations support services for overall computing systems health, status, recovery, and help support.

- 8 hours/day x 5 days/week (Monday – Friday) = 40 hours/week.

The Contractor shall establish, maintain, and adhere to Standard Operating Procedures (DRD-FDOC-0061).

3.1.5. Performance Standards

The Contractor shall provide support for determination of designs and costs for facility and software development and modifications per the change mechanism defined in Section 2.14, Configuration Management. The Contractor shall:

Required Service: Provide Design Review(s) and analysis of initial cost impact for NASA approved development and modifications.

Standard of Excellence: Complete a design and cost estimate within 8 weeks of SR submittal for 95% of the modifications in each award fee period.
 Complete a design and cost estimate within 10 weeks of SR submittal for 95% of the development activities in each award fee period for the first design review and within 5 working days of the negotiated milestone for any additional design reviews contained in the same SR.

Minimum Requirement: Complete a design and cost estimate within 10 weeks of SR submittal for 95% of the modifications in each award fee period.
 Complete a design and cost estimate within 12 weeks of SR submittal for 95% of the development activities in each award fee period for the first design review and within 10 working days of the negotiated milestone for any additional design reviews contained in the same SR.

Note: “SR submittal” is defined as the time when the applicable NASA project manager or designee concurs on design review requirements as defined in Change Control Process and Plan (DRD-FDOC-0043).

The Contractor shall also maintain delivered software. The standards, for each subsystem, for AR density in Kilo (i.e., 1000) Source Lines of Code (KSLOC) are as follows:

Required Service: Maintain at or below the following “Open” anomaly density (AR/KSLOC) for new and existing software.

Standard of Excellence: 1 anomaly per 8 KSLOC for mature software (defined as software greater than 2 years old and where no more than half of the source lines of code have changed within the prior year) and 1 anomaly per 2 KSLOC for code that is not mature.

Minimum Requirement: 1 anomaly per 5 KSLOC for mature software and 1 anomaly per 1

KSLOC for code that is not mature.

The Contractor shall:

Required Service:

Complete implementation of scheduled hardware or software development, modifications, or reconfigurations. Implementation completion is defined as Release to Operations (RTO) for hardware or software development, modifications, or reconfigurations releases or deliveries (impacts due to flight window changes or other exceptions are excluded with applicable NASA project manager approval for this performance standard).

Standard of Excellence:

Complete implementation of hardware or software development, modifications, or reconfigurations for flight priority 1 reconfigurations or modifications before the approved RTO delivery/release date.

Complete implementation of other hardware or software development, modifications, or reconfigurations by the approved RTO delivery/release date.

Minimum Requirement:

Complete implementation of hardware or software development, modifications, or reconfigurations for flight priority 1 reconfigurations or modifications by the approved RTO delivery/release date.

Complete implementation of other hardware or software development, modifications, or reconfigurations within seven calendar days of the approved RTO delivery/release date.

Note: "Approved RTO delivery/release date" is defined as the negotiated and applicable NASA project manager approved date that the Contractor is expected to complete the SR implementation.

3.1.6. Test and Checkout

In support of test and checkout for facility changes, the Contractor shall:

- Provide and adhere to a Facility Test and Verification Approach (DRD-FDOC-0050).
- Perform verification of all releases due to development, modification, or maintenance changes, including IT Security capabilities, per Test and Verification Plans and Procedures (DRD-FDOC-0051).
- Perform verification of all interfaces, including joint testing with IP facilities, per the Interface Control Documents (DRD-FDOC-0046).
- Perform verification of IT security capabilities.
- Report test status and provide a Test and Verification Report (DRD-FDOC-0052).
- Provide necessary test tools to complete verification.
- Schedule all required test resources.
- Accommodate user support of testing.
- Collect performance data and perform performance analysis of the facility systems and subsystems for trend analysis per the Technical Metrics Plan and Reports (DRD-FDOC-0007).

3.1.7. Interface Support

For the management of interface support, the Contractor shall:

- Provide support for Interface Control Document (DRD-FDOC-0046) for all facility interfaces defined in the requirements and design documents for each facility.
- Ensure continued services and compatibility for all external network interfaces.

- Provide planning and execution for meeting support, travel, interface negotiation, and end-to-end ground systems integration.

The Contractor shall create, provide, maintain, test, and troubleshoot interfaces between facilities (including applicable IP facilities), between facilities and user applications, and between user applications (reference Section 3.2.11, User Applications and Supporting Data Files Support). The Contractor shall report performance analysis per the Technical Metrics Plan and Reports (DRD-FDOC-0007).

The Contractor shall coordinate the Integrated Network Services (INS) network connectivity requirements through NASA.

3.1.8. Certification and Training

The Contractor shall provide and adhere to a Training and Certification Plan (DRD-FDOC-0042) to describe the Contractor's plans for training and certification of operations support personnel. The plan should address the guidelines of the flight control team certification requirements defined in DA-WI-16, Mission Operations Directorate Spaceflight Personnel Certification Plan. The Contractor shall certify and train software engineers, as appropriate, in accordance with JPR 2820.1, JSC Software Training Plan.

The Contractor shall provide trained and certified personnel required to support the capabilities to operate, control, setup, and change configurations and operational status for ground systems, subsystems, support systems, external interfaces, and networks.

3.1.9. Metrics/Data and Reports

The Contractor shall provide metrics, status, and data reports providing insight into the facility status in accordance with Technical Metrics Plan and Reports (DRD-FDOC-0007) and Status Reports and Reviews (DRD-FDOC-0012).

The Contractor shall provide administrative support for agendas and minutes of control boards and panels, project integration meetings, and technical cost and schedule review meetings as listed in Status Reports and Reviews (DRD-FDOC-0012).

3.1.10. Reserved

3.1.11. Special Projects (Indefinite Delivery, Indefinite Quantity (IDIQ))

All special project support will be enabled through IDIQ via delivery orders issued for the applicable facility, except as enabled through Section 3.3, Facility Engineering and Support Services (Level of Effort (LOE)).

3.2. Unique Facility Support

Unique facility support addresses specific facility support requirements that are in addition to or different from those in Section 3.1, Common Facilities Support.

The Contractor shall perform the requirements listed in Section 3.1, Common Facility Support, as well as the requirements listed in Section 3.2, Unique Facility Support, as identified for each facility unless otherwise specified in Section 3.2.

3.2.1. Mission Control Center Systems (MCCS) Facilities Support

3.2.1.1. Management

The Contractor shall comply with Federal and DoD requirements for secure communications, utilizing the COMSEC system. These systems shall provide for classified and sensitive but unclassified (SBU) communications using administrative and physical controls. Refer to

Attachment J-2, Applicable Documents.

The Contractor shall assist with the maintenance and administration of the NASA COMSEC account for secure communications.

The Contractor shall provide encryption key management services, in accordance with secure communications requirements.

The Contractor shall provide for proper handling, storage, and destruction of classified, SBU, and COMSEC documentation.

All personnel performing COMSEC requirements are required to have a minimum SECRET clearance.

The Contractor shall provide and adhere to a User Applications Strategic Plan (DRD-FDOC-0056).

3.2.1.2. Development, Modification, and Systems Engineering

The Contractor shall provide two deliveries per year for each MCC-H system/subsystem as defined in Section 1.2.1.1, Mission Control Center – Houston (MCC-H), for development and modifications that are a requirement or architecture change. These deliveries may bundle several systems/subsystems or maintain separate deliveries as is most efficient. All other development or modifications shall be released as an independent delivery to operations per the Systems Lifecycle Process (DRD-FDOC-0047) upon successful test completion.

The Contractor shall perform version control and upload of supporting data files into the operational area after receiving certification sign-off documentation from the user.

The Contractor shall provide COMSEC engineering expertise for the development of future COMSEC systems as required by NASA.

The Contractor shall provide installation support for the Secure Telephone Unit version III (STU-III), Secure Terminal Equipment (STE), various encryptors and their associated fill devices, and any other COMSEC equipment necessary for the ongoing operations of the COMSEC Equipment Facility (CEF).

3.2.1.3. Maintenance and Sustaining Engineering

The Contractor shall deliver up to two sustaining engineering releases per year of each MCC-H system or subsystem.

The Contractor shall provide technical support of the Meteorological Interactive Data Distribution Subsystem (MIDDS) to MSFC.

The Contractor shall maintain the classified messaging capability, including associated encryption key management services, storage of sensitive and classified documentation, and the interfaces to the classified point to point circuits.

The Contractor shall provide support for the maintenance of the Secret Internet Protocol Router System (SIPRNET).

The Contractor shall provide COMSEC engineering expertise for day-to-day maintenance of COMSEC systems as required by NASA.

The Contractor shall perform limited maintenance on various cryptographic equipment, as described by Memorandum of Agreement (MOA) between NASA and the U.S. Air Force. This equipment is located in the MCC-H, FOD simulator facilities, ESTL, Ellington Field and the Sonny Carter Training Facility (SCTF).

3.2.1.4. Facility Operations

The Contractor shall provide MCC-H facility operation services consistent with the following mission support operational requirements:

- Support up to two concurrent operations 312 hours/week (this staffing level includes on- and off-console support and trajectory application operations):
 - 1st operation – 24 hours/day x 7 days/week = 168 hours/week.
 - 2nd operation – 24 hours/day x 6 days/week (Monday – Saturday) = 144 hours/week
- For Cryptographic operations – 24 hours/day x 7 days/week = 168 hours/week.
- Security level – Mission Critical & Moderate Security Level Systems.

On-call support and support by special request is to be provided as required to meet special peak or critical periods of activity.

The Contractor shall provide BCC facility operation services:

- Security level - Mission Critical & Moderate Security
- Operations – 8 hours x 5 days/week (Monday – Friday). On-call and special requests can be made 24 hours/day x 7 days/week (Sunday – Saturday).
- In the event of a MCC-H deactivation and BCC activation, after the additional staffing arrives on-site (consistent with Flight Control Team plans), provide 24 hours/day x 7 days/week Telecom/Controller support for up to 60 days.

The Contractor shall maintain the classified messaging capability, including associated encryption key management services, storage of sensitive and classified documentation, and the interfaces to the classified point to point circuits.

The Contractor shall provide support for the daily operations of the Secret Internet Protocol Router System (SIPRNET).

The Contractor shall provide COMSEC engineering expertise for day-to-day operations for the COMSEC systems as required by NASA.

The Contractor shall provide operations support for the Secure Telephone Unit version III (STU-III), Secure Terminal Equipment (STE), various encryptors and their associated fill devices, and any other COMSEC equipment necessary for the ongoing operations of the COMSEC Equipment Facility (CEF).

The Contractor shall perform day-to-day operations of the equipment and its interfaces. This equipment is located in the MCC-H, FOD simulator facilities, ESTL, Ellington Field and the Sonny Carter Training Facility (SCTF).

3.2.1.5. Performance Standards

The mission control ground systems of the MCC-H perform unique critical functions and require a higher-level performance standard. Higher availability and reliability performance standards are defined as:

- | | |
|-------------------------|---|
| Required Service: | Provide ground systems services for mission control. |
| Standard of Excellence: | 100% availability of critical and non-critical functions as defined in JSC-35066, Mission Control Center System (MCCS) Level A Requirements. |
| Minimum Requirement: | 99.5% availability of critical functions as defined in JSC-35066, Mission Control Center System (MCCS) Level A Requirements, with no impact to safety, mission success, or major program schedule milestones. There is to be 98% availability of non-critical functions, with no impact to safety, mission success, or major program schedule milestones. |

3.2.1.6. Test and Checkout

The Contractor shall provide inputs to the International Ground System Specification (IGSS) verification compliance matrix.

3.2.1.7. Interface Support

The Contractor shall provide technical systems engineering and operational support to the Ground Segment Control Board (GSCB) and international Technical Interchange Meetings

(TIMs).

The Contractor shall present at and report findings from the multi-lateral and bi-lateral IP meetings that establish technical and operational interfaces and procedures with both the NASA and IP mission control centers. Examples of these meetings are the GSCB, System Security Engineering and Integration Support (SSEIS), Network and Communications Analysis Integration Team (NACAIT), Integration Verification and Test (IV&T), Ground Segment TIMs, and Joint Operations Panels (JOPs).

The Contractor shall schedule Payload Operations Control Center (POCC) facilities to support mission specific requirements, testing, secure stowage and staging of equipment, and day-to-day operations for external users (non-resident, NASA-required). The Contractor shall also participate in technical interchange meetings and project meetings as the external customer liaison.

The Contractor shall generate SRs and Mission Reconfiguration Requests (MRRs) based on external customer inputs to prepare the MCC for payload operations (for example, data display, command ability, voice access). Additionally, the Contractor shall coordinate with and submit SRs to the IRD contractor to ensure internet, phone, and facsimile reconfiguration to meet external customer needs.

The Contractor shall coordinate shipping requirements, and oversee the receipt of, unloading, and movement within FDOC facilities of Experiment Ground Support Equipment (EGSE). The Contractor shall write the Mission Integration Plan (MIP) Annex 5 to document POCC facility requirements of external customers.

3.2.1.8. Certification and Training

There are no facility-unique certifications or training requirements for MCCS facilities support.

3.2.1.9. Metrics/Data and Reports

The Contractor shall provide management reports and meeting support, providing insight into the overall facility, for the following:

- FOD Ops Cadre – weekly
- MCC Recon Data Integration meeting – twice a month
- MCCS Hazard Report – yearly or as required

3.2.1.10. Requirements Documentation

The Contractor shall adhere to the latest revision of the following documents:

- SSP-54500, International Ground System Specification Document
- PRD/PSP/OR/OD Program Number: 30000, International Space Station Orbital Vol-I and Vol-II
- International Partner Protocol Agreements
- SSP-42018, International Space Station, United States On-Orbit Segment to Ground (Through Tracking and Data Relay Satellite System) Interface Control Document, Parts 1 and 2
- SSP-50200, Space Program Implementation Plan (SPIP), Volume 1: Station Program Management Plan
- SSP-50200, Station Program Implementation Plan Volume 2: Program Planning and Manifesting
- SSP-50110, Multi-Increment Manifest Document – International Space Station Program
- JSC-29229, Flight Controller Operations Handbook (FCOH) Station Operations

- JSC-63998, MCCS User Applications Subsystem Requirements Document

The Contractor shall maintain, publish, and adhere to the following documents:

- All documents defined in Table 3.2.1.10
- JSC-64019, Mission Control Center System (MCCS) Systems Engineering Management Plan (SEMP)

Table 3.2.1.10 MCC-H Systems Level A/B/C Requirements and Interface Control Documents (ICDs)	
MCCS Level A Requirements Documents	
MCCS Level A Requirements	JSC-35066, Mission Control Center System (MCCS) Level A Requirements
User Apps Level A Requirements	JSC 35078 User Apps Level A Requirements
MCCS Level B/C Requirements Documents	
Communications Subsystem	JSC-35099 Volume 1 MCCS Communications Subsystem - Common Requirements JSC-35099 Volume 2 MCCS Communications Subsystem - GtG Requirements JSC-35099 Volume 3 MCCS Communications Subsystem - CEM Requirements JSC-35099 Volume 4 MCCS Communications Subsystem - TCS Requirements JSC-35099 Volume 5 MCCS Communications Subsystem - SCP Requirements JSC-35099 Volume 6 MCCS Communications Subsystem - SCLE Requirements JSC-35099 Volume 7 MCCS Communications Subsystem - ISSDL Requirements JSC-35099 Volume 8 MCCS Communications Subsystem - JSL-G Requirements JSC-35099 Volume 9 MCCS Communications Subsystem - S-G Voice Requirements JSC-35099 Volume 10 MCCS Communications Subsystem - Comm Network Requirements
Command System	JSC-62655, Volume 4 – 6, Mission Control Center (MCC) Command Subsystem Requirements
Voice System	JSC-35095, Volume 1 and 2, MCCS Voice Subsystem Requirements

Table 3.2.1.10 MCC-H Systems Level A/B/C Requirements and Interface Control Documents (ICDs)	
Video System	JSC-35096, Mission Control Center (MCC) Video Subsystem Requirements
Trajectory System	JSC-63986, MCCS Core Trajectory Subsystem Level B Requirements Document
Infrastructure Hardware (IHW) Subsystem	JSC-35094 MCCS Infrastructure Hardware Subsystem Requirements
Common Services Subsystem	JSC-35098 Volumes 1 & 2 MCCS Common Services Subsystem Requirements
User Applications	JSC-35113 User Applications System (UAS) Mission Planning Level B Requirements JSC-35114 User Applications (UAS) Crew Support Systems Level B Requirements JSC-35115 User Applications System (UAS) Common Tools Level B Requirements JSC-35116 User Applications System (UAS) Avionics, Systems, and Payloads (ASP) Level B Requirements
External Services Delivery (ESD) Subsystem	JSC-35086, Volume 1 - 3 MCCS External Services Delivery Subsystem Requirements
Facility Management Subsystem (FMS)	JSC-66359, MCCS Facility Management Subsystem Requirements
Storage Subsystem	JSC-35097, Volumes 1 & 2, MCCS Storage Subsystem Requirements
Network Subsystem	JSC-66360, Volumes 1 & 2, MCCS Network Subsystem Requirements
Security Subsystem	JSC-66361, Volumes 1 - 3, MCCS Security Subsystem Requirements
Meteorological Interactive Data Display System (MIDDS) and Weather Distribution System (WDS)	JSC-62860, Meteorological Interactive Data Display System (MIDDS) Level B Requirements
ISS MOD Avionics Reconfiguration Subsystem (IMARS)	JSC-36405 Integrated Planning System ISS MOD Avionics Reconfiguration Subsystem Data Products Interface Specification

Table 3.2.1.10 MCC-H Systems Level A/B/C Requirements and Interface Control Documents (ICDs)	
Goddard Space Flight Center (GSFC)	JSC-11534, Volume I, JSC/GSFC Operational Communications ICD for Mission Control Center Systems
Kennedy Space Center (KSC)	JSC-11534, Volume XV JSC to KSC Operational Communications ICD for Mission Control Center Systems
White Sands Complex (WSC) / Network Control Center Data Services (NCCDS)	JSC-11534, Volume XV JSC to SN NCCDS Operational Communications ICD for Mission Control Center Systems
George C. Marshall Space Flight Center (MSFC)	SSP-45001, Space Station Control Center to Huntsville Operations Support Center (HOSC) Interface Control Document, Parts I and II
Station Verification Facility (SVF)	SSP-50026, Station Verification Facility (SVF) to Space Station Control Center (SSCC) and Electronic Systems Test Laboratory (ESTL) External Interface Control Document (ICD), Parts I and II
ISS Mission Operations Directorate (MOD) Avionics Reconfiguration System (IMARS)	JSC-36405, IPS ISS Mission Operations Directorate (MOD) Avionics Reconfiguration System (IMARS) Data Products Interface Specification
Electronic Systems Test Laboratory (ESTL)	JSC-13241, Control Center Complex (CCC) to Electronic Systems Test Laboratory (ESTL) Interface Control Document (ICD)
Huntsville Operations Support Center (HOSC)	SSP-45001, Space Station Control Center to Huntsville Operations Support Center (HOSC) Interface Control Document (ICD) – Part 1
Canadian Space Agency (CSA)	SSP-45004, Space Station Control Center (SSCC) to Canadian Space Agency (CSA) Interface Control Document (ICD) – Part 1
Russian Space Agency (RSA)	SSP-50057, Space Station Control Center to Russian Space Agency Ground Segment Interface Control Document, Parts I and II
European Space Agency (ESA)	SSP-45011, Space Station Control Center to European Space Agency Ground Segment (ESA GS) Interface Control Document, Part 1
Japan Aerospace Exploration Agency (JAXA)	SSP-45012, Space Station Control Center to Japan Aerospace Exploration Agency (JAXA) Ground Segment Interface Control Document, Part 1
Italian Space Agency (ASI)	SSP-50612, Space Station Control Center/Space Station Processing Facility to Italian Space Agency Ground Segment Interface Definition Protocol

3.2.1.11. Special Projects (Indefinite Delivery, Indefinite Quantity (IDIQ))

There are no facility-unique special projects requirements for MCCS facilities support.

3.2.2. Reserved

3.2.3. Reserved

3.2.4. Training Systems (TS) Facilities Support

3.2.4.1. Management

There are no facility-unique management requirements for TS facilities support.

3.2.4.2. Development, Modification, and Systems Engineering

The Contractor shall provide delivery of development and modifications as a base service. The Contractor is responsible for up to two mission-specific load deliveries per year for the ISS. These deliveries shall include the integration of NASA-provided flight software and the incorporation of identified systems development, modifications and required sustaining engineering updates. Any additional program load deliveries (e.g. MPCV, SLS...) shall be enabled via IDIQ.

3.2.4.3. Maintenance and Sustaining Engineering

The Contractor shall provide releases of sustaining updates and changes as a base service per the Systems Lifecycle Process (DRD-FDOC-0047). The Contractor is responsible for up to two releases per year of core TS systems/subsystems. Sustaining changes that are independent from the release can be released to operations, per the Systems Lifecycle Process (DRD-FDOC-0047), upon successful test completion.

3.2.4.4. Facility Operations

The Contractor shall provide TS facility operations services consistent with the following operational support requirements:

On console, support up to 3 concurrent operations: (Legacy SSTF)

- 24 hours/day x 5 days/week (Monday – Friday) = 120 hours/week.
- 16 hours/day x 2 days/week (Saturday – Sunday) = 32 hours/week.
- Security level - Moderate Security Level Systems.
- On-call support and support by special request is to be provided as required to meet special peak or critical periods of activity.

The contractor shall provide generalized operations support for overall computing systems health, status, recovery, and help support for 16 concurrent operations for the following training assets:

- Full Task Trainer - 3 Operations
- Crew PTT - 3 Operations
- FCPTT- 6 Operations
- SVMF PTT -3 Operations
- RFCT/Sim City -1 Operation

3.2.4.5. Performance Standards

The Contractor provides facility systems services for TS in accordance with requirements documents. The training systems perform unique critical functions and require a higher-level performance standard. Higher availability and reliability performance standards are defined as:

- Required Service: Provide training operations services for the TS.
- Standard of Excellence: 100% system operations availability for Integrated Sims.
- Minimum Requirement: 97% system operations availability for Integrated Sims.
- Standard of Excellence: 97% system operations availability for all non-integrated Sims (e.g. PTT's FCPTT's, DST's).
- Minimum Requirement: 94% system operations availability for all non-integrated Sims (e.g. PTT's FCPTT's, DST's).

3.2.4.6. Test and Checkout

The test and checkout process shall include user standalone and integrated load checkouts.

3.2.4.7. Interface Support

The Contractor shall integrate updates into the ASTs in Russia, Germany, and Japan semi-annually. The Contractor shall coordinate with Russia on updates to the Russian-provided Soyuz trainer in the PTT area.

3.2.4.8. Certification and Training

There are no facility-unique certifications or training requirements for TS facilities support.

3.2.4.9. Metrics/Data and Reports

The Contractor shall participate in the following meetings:

- TS Control Panel – weekly
- TS Working Group - weekly

3.2.4.10. Requirements Documentation

The Contractor shall adhere to the latest revision of the following documents:

- SSP-54500, International Ground System Specification Document
- PRD/PSP/OR/OD 30000, International Space Station Orbital Vol-I and Vol-II
- International Partner Protocol Agreements
- SSP-42018, International Space Station, United States On-Orbit Segment to Ground (Through Tracking and Data Relay Satellite System) Interface Control Document, Parts 1 and 2
- SSP-50200, Space Program Implementation Plan (SPIP), Volume 1: Station Program Management Plan
- SSP-50200, Station Program Implementation Plan Volume 2: Program Planning and Manifesting
- SSP-50110, Multi-Increment Manifest Document – International Space Station Program

The Contractor shall maintain, publish, and adhere to the latest revision of the documents defined in Table 3.2.4.10.

Table 3.2.4.10 TS Systems Level A/B/C Requirements and Interface Control Documents (ICDs)	
SSTF Systems Level A Requirements Documents	
Level A Requirements Specification	JSC-36585, Level A Requirements Specification for the Space Station Training Facility
SSTF Systems Level B/C Requirements Documents	
Station Applications Subsystem	JSC-35142, Station Applications Subsystem Level B/C Requirements for the Space Station Training Facility
Station Crew Stations Subsystem	JSC-35124, Station Crew Stations Subsystem Level B/C Requirements for the Space Station Training Facility
Station Environment (ENV) Subsystem	JSC-35138, Environment Subsystem Level B/C Requirements for the Space Station Training Facility
Instructor / Operator Station (IOS) Subsystem	JSC-35122, Instructor/Operation Station Subsystem Level B/C Requirements for the Space Station Training Facility
Onboard Computer System (OBCS) Subsystem	JSC-35137, Onboard Computer Subsystem Level B/C Requirements for the Space Station Training Facility
Operations Tools (Ops Tools) Subsystem	JSC-35140, Operations Tools Subsystem Level B/C Requirements for the Space Station Training Facility
Real-Time Session Subsystem (RTSS)	JSC-35121, Real-Time Session Subsystem Level B/C Requirements for the Space Station Training Facility
Reconfiguration Subsystem (Recon)	JSC-35141, Reconfiguration Subsystem Level B/C Requirements for the Space Station Training Facility
Robotics Subsystem (ROB)	JSC-35125, Robotics Subsystem Level B/C Requirements for the Space Station Training Facility
Status and Control (SaC) Subsystem	JSC-35139, Status and Control Subsystem Level B/C Requirements for the Space Station Training Facility
Visual (VIS) Subsystem	JSC-35123, Visual Subsystem Level B/C Requirements for the Space Station Training Facility

Table 3.2.4.10 TS Systems Level A/B/C Requirements and Interface Control Documents (ICDs)	
TS21 Level A Requirements Documents	
TS21 Level A Requirements	JSC 35072, Training Systems 21 (TS21) Level A Requirements
TS21 Level B Requirements Documents	
Computational Systems Infrastructure	JSC 35075, Vol. 100, Training Systems 21 (TS21) Level B Requirements Volume 100 Computational Systems Infrastructure
Station Crew Stations Subsystem	JSC 35075, Vol. 200, Training Systems 21 (TS21) Level B Requirements Volume 200 Simulation Models
Station Environment (ENV) Subsystem	JSC 35075, Vol. 300, Training Systems (TS21) Level B Requirements Volume 300 Onboard Computer Systems
Instructor/Operator Station (IOS) Subsystem	JSC 35075, Vol. 400, Training Systems (TS21) Level B Requirements Volume 400 Student Stations
Onboard Computer System (OBCS) Subsystem	JSC 35075, Vol. 500, Training Systems (TS21) Level B Requirements Volume 500 User Support Systems
Operations Tools (Ops Tools) Subsystem	JSC 35075, Vol. 600, Training Systems (TS21) Level B Requirements Volume 600 Audio/Visual Systems
Real-Time Session Subsystem (RTSS)	JSC 35075, Vol. 700, Training Systems (TS21) Level B Requirements Volume 700 Facility
Reconfiguration Subsystem (Recon)	JSC 35075, Vol. 800, Training Systems (TS21) Level B Requirements Volume 800 Software Production Environment
TS Interface Control Documents (ICDs)	
Columbus Laboratory – Trainer U.S. (COL-TRU)	SSP-50067, Space Station Training Facility to Columbus Laboratory – Trainer U.S. Interface Control Document
Japanese Experiment Module (JEM) Segment Trainer (JST)	SSP-50068, Space Station Training Facility (SSTF) to Japanese Experiment Module (JEM) Segment Trainer (JST) Interface Control Document (ICD)
MSFC Payload Operations Integration Center (POIC) and Remote Area for Payload Support (RAPS)	SSP-50088, Space Station Training Facility (SSTF) to Marshall Space Flight Center (MSFC) Payload Operations Integration Center (POIC) and Remote Area for Payload Support (RAPS) Interface Control Document (ICD) Parts 1 & 2
Russian Segment Trainer (RST)	SSP-50069, Space Station Training Facility (SSTF) to Russian Segment Trainer (RST) Interface Control Document (ICD)

3.2.4.11. Special Projects (Indefinite Delivery, Indefinite Quantity (IDIQ))

There are no facility-unique special projects requirements for TS facilities support.

3.2.5. Reserved**3.2.6. Reserved****3.2.7. Reserved****3.2.8. Integration and Test Environment Facilities Support****3.2.8.1. Management**

There are no facility-unique management requirements for HITE/MITE and SPE facilities support.

3.2.8.2. Development, Modification, and Systems Engineering

There are no facility-unique development, modification, or systems engineering requirements for HITE/MITE and SPE facilities support.

3.2.8.3. Maintenance and Sustaining Engineering

There are no facility-unique maintenance or sustaining engineering requirements for HITE/MITE and SPE facilities support.

3.2.8.4. Facility Operations

The operations support to the HITE/MITE shall be provided per the Schedule of MCC-H Activities process. The support is one of the concurrent operations defined by Section 3.2.1.4, Facility Operations.

The Contractor shall provide HITE facility operations services consistent with the following operational support requirements:

- Security Level – Mission Critical Security System
- Special support of 24 hours/day x 7 days/week as required

The Contractor shall provide MITE facility operations services consistent with the following operational support requirements:

- Security Level – Moderate Mission Security System
- Special support of 24 hours/day x 7 days/week as required

The Contractor shall provide SPE facility operations services consistent with the following operational support requirements:

- Security Level – Moderate Mission Security System.

3.2.8.5. Performance Standards

There are no facility-unique performance standards requirements for HITE/MITE and SPE facilities support.

3.2.8.6. Test and Checkout

There are no facility-unique test or checkout requirements for HITE/MITE and SPE facilities support.

3.2.8.7. Interface Support

There are no facility-unique interface support requirements for HITE/MITE and SPE facilities support.

3.2.8.8. Certification and Training

There are no facility-unique certifications or training requirements for HITE/MITE and SPE facilities support.

3.2.8.9. Metrics/Data and Reports

There are no facility-unique metrics/data or reports requirements for HITE/MITE and SPE facilities support.

3.2.8.10. Requirements Documentation

Refer to Section 3.2.1.10, Requirements Documentation.

3.2.8.11. Special Projects (Indefinite Delivery, Indefinite Quantity (IDIQ))

There are no facility-unique special projects requirements for HITE/MITE and SPE facilities support.

3.2.9. Development Environments Facilities Support

3.2.9.1. Management

There are no facility-unique management requirements for MSDE and SDE facilities support.

3.2.9.2. Development, Modification, and Sustaining Engineering

There is no facility-unique development, modification, or systems engineering requirements for MSDE and SDE facilities support.

3.2.9.3. Maintenance and Sustaining Engineering

There are no facility-unique maintenance or sustaining engineering requirements for MSDE and SDE facilities support.

3.2.9.4. Facility Operations

The Contractor shall provide MSDE facility operations services consistent with the following operational support requirements:

- Security Level – **Moderate Mission Security System**.
- Special support of 24 hours/day x 7 days/week as needed.

The Contractor shall provide SDE facility operations services consistent with the following operational support requirements:

- Security Level – Moderate Mission Security System.

3.2.9.5. Performance Standards

There are no facility-unique performance standards requirements for MSDE and SDE facilities support.

3.2.9.6. Test and Checkout

There are no facility-unique test or checkout requirements for MSDE and SDE facilities support.

3.2.9.7. Interface Support

There are no facility-unique interface requirements for MSDE and SDE facilities support.

3.2.9.8. Certification and Training

There are no facility-unique certifications or training requirements for MSDE and SDE facilities support.

3.2.9.9. Metrics/Data and Reports

There are no facility-unique metrics/data or reports requirements for MSDE and SDE facilities support.

3.2.9.10. Requirements Documentation

Development environment requirements are specified in the Level A requirements for each applicable facility.

3.2.9.11. Special Projects (Indefinite Delivery, Indefinite Quantity (IDIQ))

There are no facility-unique special projects requirements for MSDE and SDE facilities support.

3.2.10. OTF Facilities Support**3.2.10.1. Management**

The Contractor is not responsible for configuration management and documentation maintenance of the OTF architecture baselines.

3.2.10.2. Development, Modification, and Systems Engineering

There are no facility-unique development, modification, or systems engineering requirements for OTF facilities support.

3.2.10.3. Maintenance and Sustaining Engineering

There are no facility-unique maintenance or sustaining engineering requirements for OTF facilities support.

3.2.10.4. Facility Operations

Not applicable for OTF facilities support.

3.2.10.5. Performance Standards

There are no facility-unique performance standards requirements for OTF facilities support.

3.2.10.6. Test and Checkout

The Contractor shall support the NASA testing of any development and modification changes to the OTF.

3.2.10.7. Interface Support

There are no facility-unique interface support requirements for OTF facilities support.

3.2.10.8. Certification and Training

There are no facility-unique certifications or training requirements for OTF facilities support.

3.2.10.9. Metrics/Data and Reports

Not applicable for OTF facilities support.

3.2.10.10. Requirements Documentation

Not applicable for OTF facilities support.

3.2.10.11. Special Projects (Indefinite Delivery, Indefinite Quantity (IDIQ))

There are no facility-unique special projects requirements for OTF facilities support.

3.2.11. Reserved**3.3. Facility Engineering and Support Services (Level of Effort (LOE))**

Facility Engineering and Support Services are those services provided directly in support of NASA (LOE, CLIN-004). Personnel shall be familiar with all of the facilities in this SOW to ensure proper technical interface support between FOD and the applicable NASA program or project. This section of the contract shall be initiated via Task Order using Clause H.3, Task Ordering Procedure.

Travel plans for each task are in accordance with the Travel Plan (DRD-FDOC-0019).

Average support levels are defined in Clause F.9, Level of Effort (Cost), Table F.9, Average LOE Support Level.

3.3.1. Ground Segment Control Board (GSCB)

The GSCB is a multi-lateral board that established a baseline for and controls subsequent change to operations and mission integration ground facilities related products. The GSCB also provides a forum for the resolution of technical and schedule issues, including joint operations and utilization issues.

The Security Analysis and Support Team (SART) and the Network and Communications Analysis and Integration Team (NACAIT) sub-teams chartered under the GSCB, work specific functional areas for ground systems interfaces. The Contractor shall provide support to these teams.

The Contractor shall provide GSCB engineering and Technical Interchange Meeting (TIM) support, act as International Ground System Specification (IGSS) book manager, and provide Software Review Control Panel (SRCP) support for GSCB-related topics. The Contractor shall also provide GSCB administration support, including: IP telecon set up; GSCB, TIMs, and telecon agenda development and coordination; Minutes and protocol development and distribution; IP escort coordination; IP badging. In addition to these tasks, the Contractor shall provide support for IP Network requirements and implementation coordination.

3.3.1.1. System Security Engineering and Integration Support (SSEIS)

The SSEIS is chartered to integrate and coordinate ground system security processes. In support of SSEIS, the Contractor shall provide program level security risk analyses and risk mitigation recommendations for the shared and networked ground systems. The Contractor shall investigate ground system security incidents, and provide rapid response to security

incidents.

The SSEIS provides for the development of security agreements, security requirements, architecture changes, and security protective mechanisms applications for the IP Interfaces with NASA.

Service level of support shall be defined annually by NASA.

- **Security Engineering Support**

The Contractor shall provide security-engineering support for:

- Security Documentation review and evaluation for NASA and IP documentation.
- GSCB, Mission Integration and Operations Control Board (MIOCB) Document review and evaluation.
- Development of program process and procedures regarding security.
- Security Incident support including the development of operating procedures, event reporting, event response coordination, corrective action follow-up, and final posture auditing.
- Security Protection Development support including security risk analysis, security requirements, security plans, security products and implementation, and security test support, including testing of the MCC-H/IP interfaces and support to IPs for interface testing.
- Security projects scheduling.

- **Documentation Support**

The Contractor shall provide for documentation generation, maintenance, and publication support for:

- Processes and procedures.
- IP agreement and protocols.
- ICDs.
- Security plans.
- TIMs.
- Ground segment schedules.
- Security protection documentation.

3.3.1.2. Network and Communications Analysis and Integration Team (NACAIT)

The Contractor shall provide support to the NACAIT by coordinating and documenting network communications requirements. Additionally, the Contractor shall collect program requirements changes, work with various program communities to validate the requirements, resolve any discrepancies, and document the final requirements in the program's formal requirement document.

Service level of support will be defined annually by NASA.

- **NPRD Documentation Support**

The Contractor shall provide for network program requirement documentation (NPRD) generation, maintenance, and publication.

3.3.2. Program Requirements Document (PRD)

The Contractor shall provide book management support of the program requirements

documents (PRD) into the Automated Support Requirements System (ASRS). The Contractor shall provide support to include identification, technical analysis, coordination, and documentation.

3.3.2.1. PRD Documentation Support

The Contractor shall provide for PRD documentation generation, maintenance, and publication.

3.3.3. Human Space Flight (HSF) Network Operations Integration

The Contractor shall provide technical integration support including systems analysis and engineering support to the operations of the NASA data services providers. These providers include the Wide Area Network, the NASA Ground Networks, and the NASA Space Network support. Additionally, the Contractor shall assist in integrating the other NASA centers and DoD support for HSF missions including the use of tracking radars. The emphasis of this work shall be in supporting certification that the space communications data services are fully integrated and ready to support HSF missions.

The Contractor shall support the preparation of the:

- CoFR.
- ACAs.
- Communications and data services execution.
- Service performance metrics and evaluation.
- Current and pending anomaly resolution reports.
- Space improvement recommendations.
- Periodic roll-up reports on the status of the space communications data services elements.

Service level of support will be defined annually by NASA.

3.3.3.1. Certificate of Flight Readiness (CoFR)

The Contractor shall assist in the preparation of the CoFR documentation. The Contractor shall work with the Network Support Group (NSG) and NACAIT organizations to plan the integrated implementation of space communications data services required to support HSF missions. In addition, the Contractor shall assist in the evaluation of required endorsement codes within the CoFR implementation plan. This effort shall be documented in a summary report on the results of providing space communications data services for each mission in support of Progress, Automated Transfer Vehicle (ATV), H-II Transfer Vehicle (HTV), and other scientific laboratories.

3.3.3.2. Project Management Documentation Support

The Contractor shall provide project management documents including service development, operations milestones and associated schedules, and cost and program evaluations that have sufficient depth to identify problem areas in providing the services with options for workarounds in the event of service interruption of any kind and for whatever reason. The Contractor shall provide an assessment and rollup of the ACAs necessary for successful integrated service. Additionally, the Contractor shall support all HSF Readiness Reviews.

3.3.3.3. ICD Support

The Contractor shall provide technical integration support and development of ICDs related to the NASA network services utilized by the mission support functions in this SOW. NASA network services are comprised of the Wide Area Network, the NASA Ground Networks, and

the NASA Space Network support. The Contractor shall provide assessments of the voice, video, and data services capabilities of the NASA network services to ensure that the mission support function requirements in this SOW are being met. In addition, the Contractor shall assess the planned network capabilities for future development work. Supporting travel shall be as defined per the Travel Plan (DRD-FDOC-0019).

3.3.4. Systems Engineering and Integration Support

The Contractor shall provide system engineering support services to the NASA-led effort of defining NASA's ongoing engineering projects. Engineering support shall include systems engineering, spacecraft operability definition, and system development skills to supplement NASA core competencies. The support shall include providing studies, analyses, impact statements, end-to-end architecture tradeoff assessments, implementation plans, and operations process reengineering and proposed alternatives. Services levels of support will be defined annually by NASA.

3.3.5. Architectural and Engineering Support

The Contractor shall provide system engineering and architectural design support services to the NASA Systems Engineering and ongoing NASA control center space operations engineering projects. All strategic engineering activities will be defined and scheduled by NASA. Engineering activities shall be conducted at JSC, within an office and computer laboratory environment. These NASA directed services shall include:

- Studies and analysis of proposed operations modifications.
- Identification and documentation of alternative operations solutions.
- End-to-end architecture tradeoff assessment.
- Development of strategic and tactical plans.
- Implementation plans and strategies.
- Standards development.
- Investigation of space operations process and reengineering.
- Evaluation of new NASA program requirements.
- Investigation and development of new technologies for possible operations modifications.

Service level of support will be defined annually by NASA.

The Contractor shall support the development, coordination, and refinement of the mission operations facilities strategic vision and tactical plans across all mission operations facilities reflected in the estimates above.

3.3.5.1. Documentation

The Contractor shall provide documentation generation and publication support of the system engineering and architectural design results.

3.3.6. Reserved

3.3.7. Alternate Facility Manager

The contractor shall provide Alternate Facility Manager support services to the NASA-led effort of providing Primary Facility Manager Services. Alternate Facility Manager support services shall include safety and health, facility and operations functions to supplement NASA core competencies.

Services levels of support will be defined annually by NASA.

Acronyms

- A -

A	Administration (when associated with a building number)
ACA	Associate Contractor Agreement
AFB	Air Force Base
AGVE	Air/Ground Voice Equipment
ANSI	American National Standards Institute
APFPF	Attitude and Pointing Flight Production Facility
AR	Anomaly Report
ASI	Italian Space Agency
ASQC	American Society for Quality Control
ASRS	Automated Support Requirements System
AST	American Segment Trainer
ATV	Automated Transfer Vehicle
AUTODIN	Automated Digital Network
AWIPS	Advanced Weather Information Processing System

- B -

BCC	Backup Control Center
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- C -

CaLV	Cargo Launch Vehicle
CCC	Control Center Complex
CCF	Consolidated Communications Facility
CCIS	Consolidated Communications Interface Subsystem
CDS	Consolidated Distribution Subsystem
CEF	COMSEC Equipment Facility
CEM	CCF Element Manager
CEV	Crew Exploration Vehicle
CLIN	Contract Line Item
CLV	Crew Launch Vehicle
CM	Configuration Management
COD	Center Operations Directorate
CoFR	Certificate of Flight Readiness
COL-TRU	Columbus Trainer – U.S.
COMSEC	Communications Security
COTR	Contracting Officer's Technical Representative
COTS	Commercial-Off-The-Shelf
CPS	Consolidated Planning System
CSA	Canadian Space Agency

CWBS	Contract Work Breakdown Structure
CxTF	Constellation Training Facility
- D -	
DDCS	Data Display and Computation Subsystem
DEMOS	Distributed Earth Model Orbiter Simulation
DoD	Department of Defense
DOLILU	Day of Launch Initialization Load (“l-load”) Update
DRD	Data Requirement Description
DRTS	Discrepancy Report Tracking System
DS	Data Storage
DST	Dynamic Skills Trainer
DTS	Data Telemetry System
DVICE	Digital Voice Inter-Communications Equipment
- E -	
ECLSS	Environmental Control and Life Support System
EDP	Electronic Documentation Project
EFN	Electronic Flight Note
e.g.	For example [<i>Latin</i> <i>exempli gratia</i>]
EGSE	Experiment Ground Support Equipment
EIS	External Interface Subsystem
EMCC	Emergency Mission Control Center
EMS	Environmental Management System
ENV	Station Environment
EPFOL	El Paso Forward Operating Location
ESA	European Space Agency
ESC	Engineering Support Center
ESTL	Electronics Systems Test Laboratory
EU	Electronic User
EVM	Earned Value Measurement
- F -	
FCL	Facility Clearance Level
FCOH	Flight Controller Operations Handbook
FCPTT	Flight Controller Part Task Trainer
FDOC	Facilities Development and Operations Contract
FDPA	Flight Dynamics Planning and Analysis
FEID	Flight Equipment Interface Device
FEP	Front End Processing
FEPS	Front-End Processing Subsystem
FOD	Flight Operations Directorate

FOT	Flight Operations Trainer
FTT	Full Task Trainer
FY	Fiscal Year
- G -	
GFP	Government Furnished Property
GIDEP	Government Industry Database for Electronic Parts
GOTS	Government-Off-The-Shelf
GP	General Purpose
GRC	Glenn Research Center
GS	Ground Segment
GSCB	Ground Segment Control Board
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
GSI	Government Source Inspection
- H -	
HOSC	Huntsville Operations Support Center
H&S	Health and Status
HITE	High Integration and Test Environment
HSG	Houston Support Group
HSR	Houston Support Room
HTV	H-II Transfer Vehicle
- I -	
I-loads	Initialization Loads
IAM	Integrated Asset Management
ICATT	ISS Command and Telemetry Team
ICD	Interface Control Document
IDD	Internal Data Distribution
IDDS	Internal Data Distribution System
IDIQ	Indefinite Delivery, Indefinite Quantity
i.e.	that is [<i>Latin id est</i>]
IGSS	International Ground System Specification
IMARS	ISS MOD Avionics Reconfiguration Systems
INS	Integrated Network Services
IOS	Instructor / Operator Station
IP	International Partner
IPS	Integrated Planning System
IRD	Information Resources Directorate
ISO	International Organization for Standardization
ISPX	Information Sharing Protocol External Interface

ISS	International Space Station
ISSP	International Space Station Program
I&T	Integration and Testing
IT	Information Technology
ITAR	International Traffic in Arms Regulation
ITF	Integrated Training Facility
IV&T	Integration Verification and Testing
- J -	
JAEL	JSC Avionics Engineering Laboratory
JAXA	Japan Aerospace Exploration Agency
JEM	Japanese Experiment Module
JF	JSC Form
JOP	Joint Operations Panel
JPD	JSC Procedural Document
JPR	JSC Procedural Requirement
JSC	Johnson Space Center
JSC-TV	JSC – Television
JST	JEM Systems Trainer
- K -	
KSC	Kennedy Space Center
KSLOC	Kilo Source Lines of Code
- L -	
LAN	Local Area Network
LeRC	Lewis Research Center
LOE	Level of Effort
LPS	Launch Processing System
LSAM	Lunar Surface Access Module
- M -	
MCC-H	Mission Control Center – Houston
MCCS	Mission Control Center System
McIDAS	Man Computer Interactive Data Access System
MDSC	Mission Data Storage System Complex
MIDDS	Meteorological Interactive Data Distribution Subsystem
MITE	Moderate Integration and Test Environment
MIOCB	Mission Integration and Operations Control Board
MIP	Mission Integration Plan
MOA	Memorandum of Agreement
MOD	Mission Operations Directorate
MOH	MCC Operations Handbook

MORS	Mission Operations Reconfiguration System
MOTS	Modified-Off-The-Shelf
MOVE	Mission Operations Voice Enhancement
MOW	Mission Operations Wing
MPSR	Multi-Purpose Support Room
MRR	Mission Reconfiguration Request
MSFC	Marshall Space Flight Center
MSSC	Mission Systems Security Center
- N -	
N	North (when associated with a building number)
NACAIT	Network and Communications Analysis Integration Team
NASA	National Aeronautics and Space Administration
NATT	NASA Application Tracking Tool
NCSL	National Calibration Standards Laboratory
NPD	NASA Policy Directive
NPR	NASA Procedural Requirement
NPRD	Network Program Requirement Document
NSG	Network Support Group
NWS	National Weather Service
- O -	
OBCS	Onboard Computer System
OCA	Orbital Communications Adapter
OCD	Operations Concept Document
OCI	Organizational Conflict of Interest
ODRC	Operational Data Reduction Complex
ORU	Orbital Replacement Unit
OS	Operating System
OTF	Operations Technology Facility
- P -	
PC	Personal Computer
PCAG	Platform Change Assessment Group
PCS	Portable Computer System
PDAC	Procedure Development and Control
PIM	Planning Information Management
PLT	Payload Trainer
POCC	Payload Operations Control Center
POIC	Payload Operations Integration Center
PPBE	Planning, Programming, Budgeting, and Execution
PRB	Project Review Board

PRD	Program Requirements Document
PS	Platform Services
PSS	Platform and System Services
PTT	Part Task Trainer
PV	Procedure Verification
- Q -	
QA	Quality Assurance
QMS	Quality Management System
- R -	
RAPS	Remote Area for Payload Support
RITF	Receiving Inspection and Test Facility
ROB	Robotics Subsystem
RPF	Robotics Planning Facility
RSA	Russian Space Agency
RST	Russian Segment Trainer
RTO	Release to Operations
RTSS	Real-Time Session Subsystem
RUPSM	Resource Utilization Planning and System Model
RWS	Robotics Workstation
- S -	
S	South (when associated with a building number)
SaC	Status and Control
SART	Security Analysis and Response Team
SATERN	System for Administration, Training, and Educational Resources for NASA
SBU	Sensitive But Unclassified
SCT	Self-Contained Trainer
SCTF	Sonny Carter Training Facility
SDE	Software Development Environment
SDF	Software Development Folder
SEMP	Systems Engineering Management Plan
SIPRNET	Secret Internet Protocol Router System
SMG	Spaceflight Meteorology Group
SMP	Software Management Plan
SMTF	Shuttle Mission Training Facility
SNAS	Space Network Access System
SOW	Statement of Work
SPE	Software Production Environment
SPF	Software Production Facility
SPIP	Space Program Implementation Plan

SR	Support Request
SSTF	Space Station Training Facility
STE	Secure terminal Equipment
STU-III	Secure Telephone Unit version III
SVF	Station Verification Facility
SVMF	Space Vehicle Mockup Facility
- T -	
TCP	Technical Control Panel
TCS	Test and Checkout Subsystem
TDD	Test Data Driver
TDRSS	Tracking and Data Relay Satellite System
TIM	Technical Interchange Meeting
TIRF	Transmittal/Information Request Form
TS	Telecommunications System
TS	Training Systems
TSS	Timing Subsystem
- U -	
UACB	User Application Control Board
UPS	User Planning System
U.S.	United States
USA	United Space Alliance
- V -	
VIS	Visual
VS	Video Subsystem
- W -	
WDOL	Wage Determination On-Line
WDS	Weather Distribution System
WI	Work Instruction
WSP	Workstation and Server Platform
- Z -	
ZOE	Zone of Exclusion