

ORDER 024 Revision 9
Payload Operations Integration Function (POIF)

1.0 Introduction

This Order identifies the tasks associated with the Systems Development and Operations Services (SDOS) contract in support of the Marshall Space Flight Center (MSFC) Payload Operations Integration (POI) task. POI develops integrated payload operations requirements, plans and processes and ensures their compatibility with flight and ground systems across the ISS and IP/Ps for ISS and Shuttle Sortie payloads. POI staffs the Payload Operations Integration Center (POIC) cadre positions 24 hours a day, 7 days a week, year round. POI ensures payload safety and facilitates “user access” to station resources to maximize science return and enhance mission success.

This work will include the overall management, planning, coordination, scheduling, and reporting necessary to accomplish contract requirements for this effort.

1.1 Applicable Documents

DOD 5000.2	Operation of Defense Acquisition System
15 CFR Parts 730-774	Export Administration Regulations (EAR)
22 CFR Parts 120-130	International Traffic in Arms Regulations (ITAR)
29 CFR Part 1910	Occupational Safety and Health Standards
Executive Order 13101	Greening The Government Through Waste Prevention, Recycling, and Federal Acquisition (On-site only)
ISO 9001-2000	Quality Management Systems - Requirements
MIL-HDBK-881	Department of Defense Handbook Work Breakdown Structure
MIL-STD-961 Appendix A	Department of Defense Standard Practices, Defense and Program Unique Format and Content Specifications
MIL-STD-973	Military Standard, Configuration Management
MPD 1280.1	Marshall Quality Management System Manual
MPD 2190.1	MSFC Export Control Program
MPR 7120.1	Program/Project Planning
MPR 7120.3	Data Management, Program/Project
MPR 8715.1	Marshall Safety, Health, and Environmental (SHE) Program
MPR 6410.1	Handling, Storage, Packaging, Preservation, and Delivery (H.S.P.P.&D)
MSFC-HDBK-3379	MSG Operations Interface Handbook
MSFC-HDBK-3262	MSG Safety Operations Handbook
MSFC-PLAN-3227	MSG Flight Operations Support Plan
MSFC-PLAN-3219	MSG Ground Support Personnel Training and Certification Plan
MSRR1-SPEC-0015	Payload Training Unit Development Specification

MSRR1-DOC-0001	MSRR-1 Operation Concept
MSRR1-DOC-0090	PTU User Manual
MSRR1-PLAN-0003	MSRR-1 Training Implementation Plan
MWI 7120.6	Program/Project Continuous Risk Management
MWI 8621.1	Close Call and Mishap Reporting and Investigation Program
NPD 2190.1	NASA Export Control Program
NPR 8621.1	NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating and Recordkeeping
NPD 9501.3	Earned Value Performance Management
NPR 8715.3	NASA General Safety Program Requirements
EO-WPMP-01	POIF Work Package Plan
SSP 41173	Space Station Quality Assurance Requirements
SSP 50010	Payload Ground Support Personnel Training and Certification Plan
SSP 50011	ISS Concept of Operations and Utilization (COUP)
SSP 50200-01, -07, -08, -09	ISS Program Implementation Plan (SPIP) Volumes 1, 7, 8, and 9
SSP 57000	Pressurized Payload Interface Requirements Document
SSP 58334	Configuration Management for POIF
SSP 58335	Payload Operations and Integration Data Management Plan
SSP 41184-02	Multi-lateral Training Management Plan
SSP 50323	Payload User Development Guide (PUDG)
SSP 58026-01	Generic Payload Simulator Requirements Document
480PLN0095A	MSRR-1 GSP Training and Certification Plan
480SPC0099A	PTU Laptop Software Requirements Specification
480SPC0098A	PTU Software Requirements Specification

1.2 Contract J-8 Documents

NFS 1852.242-74 & 75	NASA Contractor Financial Management Reporting
NFS 1852.204-76	Security Requirements for Unclassified Information Technology Resources
NPD 7120.4	Program/Project Management
NPR 7120.5	NASA Program/Project Management Processes & Requirements
NPR 9501.2	NASA Contractor Financial Management Reporting
NSTS 1700.7 ISS Addendum	Safety Policy and Requirements for Payloads Using the International Space Station

NSTS/ISS 18798	Interpretations of NSTS/ISS Payload Safety Requirements
MPR 8040.1	Configuration Management, MSFC Programs/Projects
MWI 6410.1	Packaging, Handling, and Moving Program Critical Hardware
JSC-DO12-96-28	Memorandum for Record: Roles and Responsibilities Relating to the Safety Review Process of All Payloads/Experiments on the ISS
SSP 50431	Space Station Program Requirements for Payloads
SSP 52054	ISS Program Payloads Certification of Flight Readiness (CoFR) Implementation Plan
SSP 57001	Pressurized Payload Interface Control Document Template
SSP 57002	Payload Software Interface Control Document
SSP 57003	Attached Payload Interface Requirements Document
SSP 57004	Attached Payload Interface Control Document
SSP 58318	MSFC Certification of Flight Readiness (CoFR)
SSP 58700	US Payload Operations Data File (PODF) Management Plan

2.0 Scope

The scope of this Order will provide the overall management, planning, coordination, scheduling and reporting to support the POI effort. Unless otherwise stated, all of the requirements of this effort are contained in this SOW and no further requirements are implied from the contract SOW. The SDOS POI Program Manager is responsible for the implementation and success of the overall project.

3.0 Management

The Contractor shall provide Management as specified in the following paragraphs:

3.1 Contract Management

The Contractor shall provide the planning, coordination, technical direction, and surveillance of the activities necessary to assure disciplined performance of work and timely application of resources for the accomplishment of the POI Task Order. The Contractor shall be responsible for maintaining communication with each supported organization and alerting the Contracting Officer's Technical Representative (COTR) immediately of any problems that would prevent meeting established milestones or product deliveries.

The Contractor shall provide NASA MSFC with necessary information on project progress to allow the Government to monitor product assurance, identify significant problems, and implement corrective action, as applicable, based on the Contractor's performance.

3.2 Financial Reporting

The Contractor shall establish, implement, and maintain a financial reporting system in accordance with the NASA FAR Supplement (NFS) 18-52.242-74&75 and NASA Procedural Requirements (NPR) 9501.2. The Contractor shall submit a Financial Management Report containing financial information accordance with DRD 916MA-005.

3.3 Planning and Control

The Contractor shall provide reporting in accordance with approved management procedures in the Management System Description provided for this contract under DRD 916MA-004. The Contractor shall provide Modified Cost Performance Reports (CPR's) in accordance with DRD 916MA-009.

The Contractor shall establish, implement, and maintain an inventory control system to track and control all Government-furnished and Contractor-acquired property. The Contractor shall comply with the Government property clauses specified in the contract. The Contractor shall prepare and maintain a report identifying and listing all Government furnished property provided for use by the Contractor in the performance of contracted effort, and for which the Contractor has been given physical custody. The Contractor shall comply with the Government Property Management Plan as submitted for the SDOS Contract in accordance with DRD 916LS-001.

3.4 Scheduling

The Contractor shall provide scheduling and other program support for the POI Task Order as specified in the following paragraphs:

3.4.1 Program Office Scheduling Support: Major Milestone Schedules

The Contractor shall develop, coordinate, and maintain the Payload Operations and Integration (POI) schedules and readiness milestones in response to ISS Program major milestones, and in coordination with related operations elements schedules. Major milestone schedules developed under this order as related to EVMS shall be included in the Contract deliverable under Order 020.

The Contractor shall maintain an archive of the POI major milestone schedules in electronic form in accordance with SSP 58335, POI Data Management Plan and have the responsibility to submit schedules and other data for POI website postings and paper distribution.

3.4.2 Other Program Support: Detailed Schedules & Other Related Analyses

The Contractor shall provide Detailed Schedules and Other Related Analyses at Levels II-V. Detailed schedules developed under this order are not required in the Contract Deliverable, but should be available as a working document under Office of Primary Responsibility (OPR) control. These schedules shall be maintained on the POI web server and updated by the 10th business day of the month. The source for POI Project Milestones shall be the JSC OZ2/Payload Mission Integration Team website. The POI schedules are not required to be submitted to the CSD at JSC.

3.5 Risk Management

The Contractor shall document and implement a risk management process, using NPR 7120.5, "Program and Project Management Process and Requirements" as guidelines, to increase the likelihood of achieving program/project goals. The Risk Management Plan developed according to MWI 7120.6, "Program/Project Continuous Risk Management," and approved for this contract under TO-001MA-002 provides specific information on how the Contractor shall implement the risk management requirements of NPR 7120.5 and how risk items shall be documented and communicated to the Government. As part of the risk management process, the Contractor shall provide a prioritized list of potential risks for this Order. In addition, the risk analysis and risk

tracking reports shall be provided throughout the life cycle of the program/project. The Contractor shall immediately notify MSFC of problems that pose a potential risk to cost, schedule, and performance of deliverable end items.

3.6 On-site Employee Location Listing

The Contractor shall provide NASA a list of all onsite Contractor employees working under this contract and their designated locations in accordance with DRD 916CD-002. The Contractor shall include information for this Task Order in the On-Site Employee Location List delivered under Order 020 of the SDOS Contract.

3.7 Technology Reports

The Contractor shall provide any Technology Reports in accordance with paragraph 3.7 of the Contract SOW.

3.8 Program Management Reviews (n/a)

3.9 Work Breakdown Structure (WBS)

The Contractor shall include the Work Breakdown Index for this Task Order in accordance with the requirements specified in paragraph 3.9 of the Contract SOW with the following clarification:

The format of the WBS Dictionary shall be as specified by NASA in DR TO024MA-001.

3.10 Configuration Management (CM)

The Contractor shall plan, develop, and maintain the POI Configuration Management (CM) and Data Management (DM) processes as documented in SSP 58334 and SSP 58335. These processes apply to the documentation that is directive to POI or produced by POI. POI documentation shall comply with standards and requirements defined in SSP 58334, Configuration Management for Payload Operations Integration and the POI Data Management Plan, SSP 58335. The Contractor shall deliver SSP 58334, Configuration Management for Payload Operations Integration in accordance with DR TO024CM-001. The Contractor shall deliver SSP 58335, POI Data Management Plan in accordance with DR TO024CM-002.

The Contractor shall, in support of the POI Certification of Flight Readiness (CoFR) process, develop and maintain a matrix of CM controlled flight and ground products. This matrix includes Change Board managed and OPR managed documentation. The Contractor shall provide the secretariat personnel to support the POI Control Boards and Technical Coordination Meetings to provide minutes, prepare directives, track and record actions. The contractor shall perform the CM document quality (DQA) verification.

The Contractor shall be responsible for the archival of ISS payload flight execution information and configuration managed data in accordance with SSP 58335, POI Data Management Plan.

3.11 Safety and Mission Assurance (S&MA)

The Contractor shall comply with the Safety and Mission Assurance (S&MA) Program for overall administration of this contract as defined in the following paragraphs:

3.11.1 Off-Site/On-Site Contractor Safety Program Plans

The Contractor shall establish and implement an industrial safety, health, and environmental program that incorporates the following Safety and Health Program Core Process Requirement (CPR) elements (in accordance with the approved plan for this contract under DRD 916SA-001 and documented in MPR 8715.1 “Marshall Safety, Health, and Environmental (SHE) Program”).

- a. Management commitment and employee involvement in the safety and health program.
 1. Document worksite safety and health policy.
 2. Establish and communicate clear safety and health goals.
 3. Full management involvement in implementation of the safety and health program (e.g., management led safety and health committee and supervisor led monthly safety meetings).
 4. Full employee involvement in the safety and health program.
 5. Assign and communicate responsibilities.
 6. Provide authority and resources to correct safety and health deficiencies.
 7. Provide or allow access to professional safety and health staff.
 8. Hold management and employees accountable for safety and health.
 9. Conduct annual self-evaluation reviews.

- b. System and worksite hazard analysis.
 1. Complete and update baseline surveys.
 2. Perform analysis of new work.
 3. Perform hazard analysis of all jobs [i.e., job hazard analysis (JHA)].
 4. Conduct safety and environmental inspections (i.e., at a minimum, one per supervisor per month).
 5. Establish and maintain a hazard reporting system.
 6. Investigate all mishaps and “close calls,” and correct hazards.
 7. Analyze all injury, illness, and “close calls” trend data

3.11.2 Mishap Reporting

The Contractor shall investigate and report mishaps occurring during operations in accordance with NPR 8621.1, “NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping,” and MWI 8621.1, “Close Call and Mishap Reporting and Investigating Program.” Mishaps shall be reported to the MSFC S&MA Office in accordance with DRD 916SA-002. Input for this Task Order shall be included in the deliverable submitted for the SDOS Contract.

3.12 Export Control

The Contractor shall comply with all U.S. Export Control Laws and Regulations, including International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130, and the Export Administration Regulations (EAR), 15 CFR Parts 730-774, in the performance of this Task Order.

The Contractor shall prescribe to NASA and MSFC export procedures, guidelines, and policies as given in NPD 2190.1 and MPD 2190.1.

The Contractor shall identify, classify and track all export commodities (i.e. Internet web pages, software, technologies, Scientific and Technical Information (S&TI), available documentation,

specifications, drawings, etc.) pursuant to NASA/MSFC Export Control Program and other Federal Agency rules or regulations.

If the Contractor claims that an export commodity is in the public domain, then the Contractor shall be required to provide evidence to support this claim to NASA.

3.13 IT Security

The Contractor shall perform in accordance with the Information Technology Security Plan approved for this contract under DRD 916CD-003.

The FAR requirement NFS 1852.204-76, Security Requirements for Unclassified Information Technology Resources, shall apply to all onsite and offsite employees using computers that access MSFC, ISS, and other NASA computer networks. Additionally, this FAR clause applies to all computer databases to be created and maintained by the Contractor. This FAR clause shall not apply in this case to those IT resources identified in sections 4.6.7 and 4.9, as those IT resources are maintained by the MSFC Center Operations Directorate.

4.0 Sustaining Support

The Contractor shall provide Sustaining Support for the POI Task Order as specified in the following paragraphs:

4.1 Procurement (n/a)

4.2 Graphics (n/a)

4.3 Strategic and Tactical Planning (n/a)

4.4 Records and Archiving (n/a)

4.5 Database Management and Documentation

The Contractor shall establish and/or maintain the capability to access and interact with the International Space Station and other NASA program information systems and databases relative to POI. The Contractor shall procure equipment (hardware and software) necessary to support the performance of daily tasks within this Order.

4.6 Scientific Information (n/a)

4.7 Ground-Based Research & Technology Development (n/a)

4.8 Telescience Support Center (TSC) Facility Development and Maintenance (n/a)

4.9 Website Support

The Contractor shall design, develop, and maintain the host equipment, web sites and pages to support POI products. Administrative functions shall include user account creation and maintenance,

evaluation and application of security patches dictated by MSFC standards, development and maintenance of the Payloads Web Server system security plans, implementation of system hardware and software upgrades, maintenance of procedures and processes required to support all web server administrative functions.

4.10 Special Studies N/A

4.11 Project Manager Support

The Contractor shall support POI administrative tasks such as coordinating meeting and telecon logistics, taking meeting minutes, recording actions, developing and tracking metrics to support process improvements.

4.12 Review and Oversight of Payload Developers Activities Support (n/a)

4.13 Systems Engineering Support (n/a)

4.14 Plans and documentation (n/a)

4.15 Research and Technology Development (n/a)

5.0 Experiment/Facility Development and Operations

This section of the SOW defines the Contractor's efforts in the integration and operation of payloads and facilities. The following sections define the tasks that are required of the Contractor:

5.1 Management Support

The Contractor shall manage and control this Order in accordance with the requirements listed below:

5.1.1 Project Planning

The Contractor shall define the resources, structure, approach, and processes required to complete the Payload Operations and Integration task. Team Leads shall be identified to support the overall project planning for Payload Operations and Integration.

The Contractor shall provide the resources required to support the Manned Space Flight Awareness Award process. The Contractor shall procure award and honor articles, such as pins, patches, and certificates per Customer request. The Contractor shall provide support as specified in paragraph 4.6.8 of the contract SOW. The contractor shall provide periodic administrative meeting set-up, support and coordination for POIF training, workshops, technical and VIP meetings hosted by POIF. The Contractor shall also procure hardware and software necessary to support the High School Students United with NASA to Create Hardware (HUNCH) Project and the POI web server function as required upon Customer agreement. In addition, the Contractor shall procure office supplies necessary to support the performance of daily tasks within this Order.

5.1.2 Order Management Reviews

The Contractor shall prepare and present status of this Order at the Contractor Status Meeting. It is expected that this meeting would occur at least monthly. These status reviews shall encompass technical, schedule, risk assessment, cost, accomplishments, concerns/problems, changes and projections.

The Contractor shall support other reviews and provide special reports as required to discuss and resolve technical and programmatic problems and changes that may occur in the course of the Contract. In addition to status reviews, the Contractor shall prepare data (e.g. ROM estimates) for and support other reviews, such as, ISS Program Budget review process, MSFC annual reviews, as defined by the Order Monitor. If required by the Order, the Contractor shall provide preliminary copies of review material and presentations to MSFC for dry run and approval prior to the formal Review.

The NASA Customer shall specify in accordance with the budget or special request guidelines, the format and content of the Contractor input and supporting rationale required in support of the Government Budget review process.

5.2 Systems Engineering (n/a)

5.3 Experiment/Facility Definition (n/a)

5.4 Payload/Carrier Definition (n/a)

5.5 Payload/Carrier Development (n/a)

5.6 Payload/Carrier Fabrication, Test and Check-out (n/a)

5.7 Payload Integration, Training and Operations

The Contractor shall provide the operations personnel and capability to accomplish: Operations preparation, planning, training, and execution of on-orbit payload operations functions for Payloads, Payload Support Systems (PLSS), EXPRESS Rack, MELFI, WORF, ELC and post-flight and post-increment functions. The Contractor shall provide the following POI essential payload operations functions: controlling the PLSS; facilitating the on-orbit operation of payloads by Principal Investigators and Crew; managing shared resources; and assuring the safety of payload operations.

The Contractor shall base planning for this revision on the July 2009 Assembly Sequence (Attachment 1) Ref_ASOV_072009_CD11777_CR11814_haf.ppt and the OZ Integrated Payload List (Attachment 2 OZ IPLC PCB Baseline).

5.7.1 Integrated Requirements Development

The Contractor shall gather and integrate POI requirements based upon the SSP 50011, ISS Concept of Operations and Utilization (COUP) and provide recommended updates to the applicable SSP 50200, ISS Program Implementation Plan (SPIP) Volumes 1, 7, 8, and 9 as payload operations requirements and processes evolve. The Contractor shall implement operational processes and procedures in accordance with the SSP 57000, Pressurized Payload Interface Requirements

Document; SSP 57002, Payload Software Interface Control Document; and SSP 57003, Attached Payload Interface Requirements Document.

The Contractor shall perform tasks necessary for the integration of payload operations planning and requirements for ground and on-board systems. This includes the development of the integrated payload operations processes for generic and increment specific integration of plans to train, certify, and execute 24x7 ISS payload operations.

The Contractor shall provide integrated process definition for interdependent operations and training entities (Mission Control Center-Houston (MCC-H), Payload Operations Integration Center (POIC), International Partner payload operations centers, users, and crew).

The Contractor shall develop and maintain the payload operations concepts and processes, perform the required analyses to integrate the operational requirements, and participate in the associated working groups, boards, and panels.

The Contractor shall coordinate with EXPRESS Rack Engineering Integration, EXPRESS Rack Sustaining Engineering, and Payload Engineering Integration to support the ISS vehicle implementation functions.

The Contractor shall review vehicle requirements and provide payload operations inputs into the ISS flight systems design and operations; including the Command and Data Handling System, Integrated Monitoring and Control System, Payload Executive Processor Software System, Communication and Tracking, ISS onboard software, and other vehicle systems supporting payload operations.

The Contractor shall provide support to define and maintain the functional capability requirements of the POIC. Support shall be provided to the requirements definition, development, test, and verification for operations tools. This includes, but is not limited to, the POIC facility interface tools, the Enhanced Huntsville Operations Support Center System (EHS) components, International Procedure Viewer (IPV), and Payload Planning System software tools.

The Contractor shall implement operational processes and procedures in accordance with the POIF Work Package Plan (EO-WPMP-01).

The Contractor shall develop and maintain the operational requirements to support crew and ground support personnel payload training and simulations, payload ground data services, planning, operations constraints, rules, and regulations for ISS payloads and ETOV SORTIE payloads.

The Contractor shall provide input to information system planning and requirements to support analysis of network architectures and facility interfaces to the POIC, Space Station Training Facility (SSTF)/Payload Training Center (PTC), Payload facilities, MCC-H, International Partner payload control centers, and other user facilities.

The Contractor shall implement the requirements for the POI Ground Support Personnel (GSP) Training and Certification Plan, the Multi-lateral Training Management Plan, US PODF Management Plan and Annexes, and the ISS Payload Training Implementation Plan.

The Contractor shall implement the requirements for the SSP 52054, ISS Program Payloads Certification of Flight Readiness (CoFR) Implementation Plan.

5.7.2 Integrated Analysis (n/a)

5.7.3 Integrated Carrier Verification (n/a)

5.7.4 Operations Development

The Contractor shall provide operations support throughout the development and operation of the payload/facility/carrier, participating in requirements development, design reviews, and ground testing to support increment preparation, on-orbit operations, and post increment activities.

The Contractor shall perform operations preparation functions in support of generic and increment specific payload operations on the ground and onboard the ISS and ETOV.

The Contractor shall plan, develop, and maintain POI expert systems and tools required to support operations preparation and execution. This includes, but is not limited to, development support of /iPV, PPS, DSRC, and accompanying user guides, training plans, and operational verification of the ground support tools and systems.

The Contractor shall perform POI pre-increment planning and integration for US and International Partner payload operations. This includes requirements collection and analysis, payload activity and data flow analysis, and identification of increment planning software requirements as plans and concepts evolve.

The Contractor shall develop and maintain generic simulator documentation as required in support of the training and simulation processes.

The Contractor shall coordinate and integrate the activities of the ground support team (POIC Cadre) in support of the development and maintenance of payload related POIC databases (i.e. POIC payload contact database, ATLAS training database, and Payload Hazard Control database), software, documents, operations products, and schedules.

The Contractor shall provide input to the Payload Operations Handbook (POH) and Operations Interface Procedures (OIPs) regarding operating protocols and interfaces with MCC-H, International Partners, users, cadre personnel, and facilities.

The Contractor shall integrate and implement all activities required in support of the US PODF Management Plan (SSP 58700) and Annexes. This includes the baselining process for operations nomenclature, procedures, and displays.

The Contractor shall support the review of payload safety documentation to ensure that POI flight products are in compliance.

The Contractor shall provide the POI Safety function in preparation and support of on-orbit operations. The Contractor shall provide personnel to support the Payload Safety Review Panel processes and evaluate the POI flight operations products for flight safety compliance. The Contractor shall perform analysis to ensure the operational products maintain hazard controls and safe operations. The Contractor shall perform Independent Safety Verification Reviews of the US Payload procedures. The Contractor shall develop and maintain the Payload Operations Safety Database. The Contractor shall provide Payload Safety Training to the ISS Crew and POI Ground Support Personnel.

The Contractor shall develop and maintain the Payload Hazard Control Matrix. The Contractor shall deliver this documentation in accordance with DR TO024OP-002.

The Contractor shall develop end-to-end systems data supporting payload operations. This includes POIC displays, special computations, scripts, and operations notes regarding hardware and software pre-flight issues that impact flight operations.

The Contractor shall develop and maintain console documentation and operations manuals to support the training readiness of the POIC Cadre. This task includes, but is not limited to the payload systems manuals, console handbooks, and computer based training.

The Contractor shall provide input and support the execution of the POIC Ground Support Personnel Training and Certification Plan.

The Contractor shall provide support to the processes defined for the Payload Operations Control Board (POCB), the NASA POCB, the US PODF Control Board, and the ODF Control Board as required. The Contractor shall provide board and panel representation/membership as required.

The Contractor shall input to and coordinate plans and procedures defining the International Partner interfaces, payload support systems usage, and general operations.

The Contractor shall provide an integration function across all POI disciplines to ensure increment/flight schedules and certification.

The Contractor shall support ISS Program Reviews, as well as POI Internal Reviews in accordance with POI Schedules and ISS major milestones. This includes reviewing documentation, coordinating agendas, consolidating required data packs, posting on POI websites, and tracking actions.

The Contractor shall support the ground support personnel training and simulation processes with the necessary products, tools, and personnel.

The Contractor shall maintain SSP 58318, MSFC Certification of Flight Readiness (CoFR) Implementation Plan. The Contractor shall provide the necessary data required to support the POI Certification of Flight Readiness endorsements as specified in SSP 58318. This includes, but is not limited to, inputs in support of Payload Operations CoFR for POIC Cadre positions, plans, procedures, and processes.

5.7.4.1 Planning, Operations, and Analysis

The Contractor shall plan, develop, and execute the requirements defined in support of mission planning and product development. The collection, assessment, coordination, documentation, and software modeling of both ETOV and ISS payload planning requirements shall be the responsibility of the Contractor. The detailed definition of the payload operations portion of the Increment Operations Plan (IOP), payload planning products, detailed knowledge of ISS planning tools utilization (i.e. Payload Planning System), and the execution of the sub-elements of the POI schedules are critical components required of the Contractor to support ISS NASA elements and Partner integrated planning.

The Contractor shall provide for the increment specific planning product development and associated training for the development of the Final Integrated Payload On-orbit Ops Summary (OOS), the Planning Ground Rules and Constraints, the review of the integrated systems and payloads planning

products and plans, simulation support, and inputs to increment preparation and real time documentation such as POHs, OIPs, payload regulations, and flight rules.

The Contractor shall plan, develop, and coordinate activities required to support all ETOV mission payload operations both to and from the ISS for NASA elements and International Partners. This includes ETOV SORTIE payload procedure definition, development, and verification; the coordination of ETOV transfer and pre-pack items, the development and verification of associated procedures and the conduct of ETOV SORTIE payload crew operations training. The Contractor shall be governed by Operations Data File (ODF) standards and baselined Operations Nomenclature guidelines as dictated by the US PODF Change Board.

5.7.4.2 Space Systems Operations

The Contractor shall provide input and support the conduct of facility interface testing to verify capabilities required to execute ISS payload operations. This includes the development of requirements, plans, and procedures necessary to support ground and flight systems transitions, database validation, facility interface verification for NASA elements (Remote Sites, Telescience Centers) and International Partner Control Centers.

The Contractor shall support the HOSC facility processes. This includes but is not limited to panel and board support, schedule coordination, test support, and tool and network planning.

The Contractor shall provide for the increment specific data planning product development in support of the Final Integrated Payload On-orbit Ops Summary (OOS), the Planning Ground Rules and Constraints, the review of the integrated systems and payloads planning products, simulation support, and inputs to increment preparation and real time documentation such as POHs, OIPs, payload regulations, and flight rules.

The Contractor shall support increment preparation of the flight and ground data systems with respect to NASA elements and International Partner interfaces. This includes Command and Data Handling (C&DH) Systems, Communications and Tracking (C&T) Systems, Payload Support Systems, Ground Facility Systems, EXPRESS Rack, MELFI, WORF, MSG, MSRR-1, ELC, Antenna Management (ANTMAN) software, Data System Routing and Configuration (DSRC) software, and EHS. The Contractor shall support the development, test, verification, and validation processes for command and telemetry database releases.

The Contractor shall support the development of payload ground data services requirements in support of on-orbit operations.

The Contractor shall support the development of International Partner imagery requirements.

The Contractor shall develop, verify, and maintain the Ground Command Procedures utilized by the POI Cadre to manage payload support systems and specific payloads.

The Contractor shall develop, verify, and maintain automated procedures and use of the automated Timeliner software for selected payload support systems, integrated payloads, EXPRESS Rack, EXPRESS subrack payloads, WORF, MSG, MSRR-1, ELC, and MELFI. These procedures shall be developed in accordance with standards dictated by the US PODF Management Plan and Annexes.

The Contractor shall plan, develop, and execute procedures and processes in support of facility class payload operations. This task includes EXPRESS Rack, WORF, MSG, MSRR-1, ELC, and MELFI

facilities. The Contractor shall be responsible for crew and cadre training and simulations, as well as the associated product development in support of these training functions. The Contractor shall provide for the facility class payloads on-orbit near real time operations support during increment operations.

The Contractor shall provide the personnel to support the MSG and MSRR-1 Project Management with responsibilities to include but not be limited to participation in weekly meetings; on-orbit status monthly reports; project-level documentation development, review, and configuration control; and schedule coordination.

The Contractor shall maintain MSG and MSRR-1 project documentation. This includes but is not limited to MSFC-PLAN-3227, MSG Flight Operations Support Plan; MSFC-PLAN-3219, MSG Ground Support Personnel Training and Certification Plan; MSFC-HDBK-3379, MSG Operations Interface Handbook; and MSFC-HDBK-3262, MSG Safety Operations Handbook, 480PLN0095A, MSRR-1 GSP Training and Certification Plan; MSRR1-SPEC-0015, Payload Training Unit Development Specification; MSRR1-PLAN-0003, MSRR-1 Training Implementation Plan; MSRR1-DOC-0001, MSRR-1 Operation Concept; 480SPC0099A, PTU Laptop Software Requirements Specification; 480SPC0098A, PTU Software Requirements Specification; and MSRR1-DOC-0090, PTU User Manual.

The Contractor shall support daily status meetings on the flight and payload systems. The Contractor shall manage coordinate and maintain the Payload Anomaly Reports (PARs) as identified during on-orbit operations. The Contractor shall be responsible for tracking issues, actions, and status from initiation to resolution.

The Contractor shall participate in payload design reviews, payload developer site testing, SSITF testing, and KSC testing.

The Contractor shall support assessments of the C&DH and C&T systems as related to payload operations.

The Contractor shall support the Hardware/Software On-orbit Reconciliation tracking effort.

5.7.4.3 Training and Crew Operations

The Contractor shall perform activities required to plan, develop, and verify ISS payload and ISS payload systems ground and on-orbit procedures and displays. The Contractor shall maintain the US PODF as it resides in the ISS Procedures Viewer (iPV). The Contractor shall be governed by Operations Data File (ODF) standards and baselined Operations Nomenclature guidelines as dictated by the US PODF Change Board. The assessment of flight and ground system requirements as they support the maintenance of iPV is critical to the Contractor's ability to produce the US PODF.

The Contractor shall integrate, build, verify, and maintain payload procedures in iPV flight and training libraries in support of ground and on-orbit training and operations execution.

The Contractor shall support all milestones related to the training and simulation processes for crew and ground support personnel. This includes the planning, requirements definition, development, documentation, and execution of Crew and GSP training and simulations at JSC, MSFC, and other facilities. The Contractor shall provide the personnel to support and chair technical interchange meetings, training strategy team meetings for crew and GSP training requirements definition, simulation engineering, crew training coordination, and the associated schedules maintenance.

The Contractor shall develop and maintain a Crew Training Matrix for each increment.

The Contractor shall provide the personnel to support the development and certification of training courseware and training instructors for ground and crew training and simulation processes. To support the conduct of crew and ground training, the Contractor shall participate in payload design reviews, payload developer site testing, SSITF testing, and KSC testing.

The Contractor shall provide the personnel to support the MSG and MSRR-1 Project Management with responsibilities to include but not be limited to participation in weekly meetings; on-orbit status monthly reports; project-level documentation development, review, and configuration control; and schedule coordination.

The Contractor shall provide MSG science investigation inputs, as necessary, to MSG facility ground test plans and procedures in support of troubleshooting, facility improvement, and payload integration activities.

The Contractor shall plan, integrate, and implement activities necessary for Payload Display Review Team early assessments leading to verification of payload displays. The Contractor activity shall include support of payload usability reviews for procedures and displays. The Contractor shall develop tools and courseware as required to support the payload usability process.

The Contractor shall plan, develop, and implement processes and procedures to accomplish payload stowage and payload cold stowage integration functions.

The Contractor shall provide input to the US PODF Management Plan and Annexes.

The Contractor shall provide support to the Multi-lateral Payload Training Panel (MPTP). Tasks include, but are not limited to leading the MPTP peer review processes for multi-lateral training inputs; integrating cross-partner training products; and coordinating with the external boards and panels associated with partner training interfaces and processes.

The Contractor shall maintain the Multi-lateral Training Management Plan and the ISS Payload Training Implementation Plan.

The Contractor shall maintain the POI Ground Support Personnel (GSP) Training and Certification Plan. The Contractor shall deliver this document in accordance with DR TO024OP-001.

The Contractor shall manage the execution of GSP training as dictated by the GSP Training and Certification Plan and associated processes. This includes maintaining the training courseware library and software, as well as the schedules required for training execution.

The Contractor shall be responsible for the archival of all training records pertaining to GSP training and certification.

The Contractor shall support the planning, development, and execution of payload operations training and simulation requirements levied on the following crew and ground team training and flight facilities: Space Station Training Facility (SSTF), Payload Training Complex (PTC), KSC facilities, MSFC facilities, and other JSC facilities.

The Contractor shall plan, development, and execute all phases of the simulation process. This

process includes joint simulations with other flight control teams and stand alone simulations for POI cadre and payload developer teams. All associated tools, courseware, scripts, and other documentation shall be developed by the Contractor as required.

The Contractor shall plan and develop training materials to be provided to the payload developer teams. This includes POI Payload Academy training.

The Contractor shall provide the on-site JSC resident support to facilitate and coordinate the integration and implementation of payload crew and ground training and simulations.

The Contractor shall develop Generic Payload Models (GPM) that simulate the functionality of the payload and its interfaces to the ISS core systems. These simulations shall include data downlink and commanding for crew and ground support personnel interfaces. This task shall include the maintenance of existing payload training simulators and models, such as the MELFI Trainer, along with the development of new models, mockups, and simulators. These tasks are to be completed in accordance with requirements and guidelines as specified by SSP 50323, Payload User Development Guide (PUDG) and SSP 58026-01, Generic Payload Simulator Requirements Document.

The contractor shall develop a simulation of the payload and stowage for the Glass Rack Trainer (GRT). This two dimensional modeling shall be at a sufficient level to train the ISS crew and cadre on payload and stowage operations. This task shall include the maintenance of existing GRT payloads along with the development of new GRT payloads stowage facilities. This task shall also include an understanding of the GRT operating and development system, trouble shooting any GRT system problems, and verification of any system upgrades.

The Contractor shall provide the systems engineering support for the MSFC-to-SSTF interface. This task shall include an understanding of both Marshall Space Flight Center (MSFC) and Space Station Training Facility (SSTF) systems, data base/model configuration and development, facility-to-facility verification, problem assessment and testing, and general support for data flow and commanding for payload training. The development of test procedures, instructor operating procedures, and instructor operating displays is included. This task includes interface testing of PD provided PTS. This task also includes systems engineering support required for the GRT, Payload Simulator Environment, and GPM.

The Contractor shall support and participate in the High School Students United with NASA to Create Hardware (HUNCH) project to include procurement of necessary hardware and software as required in support of the project. The Contractor shall provide project leadership along with JSC personnel to coordinate the development of low to medium fidelity hardware and software to support training efforts for NASA ground support personnel.

5.7.5 Training

The Contractor shall work with the Payload Developer teams and POI disciplines to implement the requirements for ground team training. The Contractor shall provide training to the PD teams and POI GSP personnel to support proper decision making. The Contractor GSP shall participate in all required training defined by the GSP Training and Certification Plan and incorporated into Individual Training Plans and shall participate in mission simulations as required.

5.7.5.1 POI GSP Training and Certification

The Contractor shall plan, develop, and maintain job descriptions and training plans for all contractor-staffed POIC Cadre positions to be certified. The Contractor shall execute the documented training plans in support of cadre certification.

The Contractor shall participate in the POI GSP Training. This includes, but is not limited to documentation review, roundtable discussions, formal presentations, training scenarios, simulations, and Payload Academy.

The Contractor shall conduct training and simulations in accordance with documented POI GSP training and certification requirements. This includes coordination of POI interface training for the payload developer and POI ground support personnel.

5.7.6 Integration and Launch Site Support (n/a)

5.7.7 On-orbit Operations

The Contractor shall provide certified console operators to conduct payload operations on a 24 hour x 7 day basis. The staffing shall be determined based on work load, necessity for 24 hour staffing, criticality of data, video, and payload monitoring and control, and re-planning effort. This includes control room staffing, on-call support, and off-console functions required to support position certification as dictated by the GSP Training and Certification Plan and associated Individual Training Plans. The console functions include payload and systems integration tasks associated with mission planning, operations control, data management, stowage, safety, on-board and ground procedure management, facility management, MSG science investigations, and shuttle operations.

The Contractor shall provide the following 24x7 console positions: Operations Control (OC), Timeline Change Officer (TCO), two Payload Rack Officers (PRO), Data Management Coordinator (DMC), and Shuttle Operations Controller (SOC) during ETOV operations only. The Contractor shall provide two Payload Communications Manager Console positions as a 16x5 position and a 16x7 position. The Contractor shall provide the Stowage console position as 16x5 positions.

The Contractor shall provide certified console operators for the following during MSG and MSRR-1 on-orbit operations: MSG/MSRR-1 operations, command, and control; and MSG Investigation operations.

The Contractor shall provide 8x5 personnel in support of the following POI on-orbit real time processes: data management and archival, safety, planning, procedures, stowage, anomaly resolution, execution product review and preparation, and Operations Change Request (OCR) processing. These include Real time Information Control Officer (RICO), Payload Systems Engineer, Safety Engineer, PODF Support, Increment Lead Stowage, Increment Lead Operations Control, Increment Lead Payload Rack Officer, Increment Lead Data Management Coordinator, Increment Lead Payload Communications Manager, Increment Lead Planning function, and Payload Planning Manager.

The POIC Safety Engineer shall identify an on-call certified individual at all times. During the individual's on-call status, he/she must maintain proximity to the POIC, such that he/she can provide support in presence to the POIC within 2 hours of being called.

5.7.8 Post Mission Activities

The Contractor shall support post mission reviews and provide inputs to post mission lessons learned as required.

5.8 Maintenance and Sustaining Engineering (n/a)

5.9 Ground Control Tests (n/a)

6.0 Travel

The Contractor shall provide estimates for domestic and international travel as requested by NASA to support the tasks in this Order. The Contractor shall comply with NASA and MSFC regulations.

7.0 Government Furnished Equipment

For work that will be performed on-site at MSFC, the government will provide the normal on-site facilities and telephones. The Contractor shall procure under this order computer equipment necessary to support the performance of daily tasks within this Order and hardware, software, and associated licenses necessary to support the POI tasks as specified under this order. The Contractor shall track all Government Furnished Property in accordance with the Contract SOW.

8.0 Materials

The Contractor shall identify and procure materials necessary to support the tasks in this Order. The Contractor shall procure office supplies necessary to support the performance of daily tasks within this Order.

9.0 Period of Performance

The period of performance for this Order shall be ATP through June 30, 2012.

10.0 Deliverables

The DRL below defines the data requirements under this contract and the frequency of submission for data under this contract.

Table 1. Data Requirements List (DRL)

Order DRD No.	Source DRD No.	Data Requirement Title	Data Type	Updates	Initial	30 days prior To NASA CCB
TO024CM-001	SSP 58334	Configuration Management Plan	1			X
TO024CM-002	SSP 58335	Data Management Plan	1			X
TO024MA-001		WBS Dictionary	2	10 calendar days after change	30 days after ATP	
TO024OP-001		GSP Training and Certification	1			X
TO024OP-002		Payload Hazard Control Matrix	1			X

11.0 Performance Fee Plan

This paragraph defines the criteria by which the Payload Operations and Integration Function Order will be evaluated for performance fee determination.

Evaluation Criteria

Schedule	30%
Technical Performance	50%
Cost Control Performance	20%

11.1 Performance Measurement

The Contractor shall perform self-surveillance and discuss metrics with the Order Monitor on a monthly basis. All evaluation metrics will be comprised of an evaluation by the Order Monitor, NASA observation of Contractor performance, and tracking of deliverables and metrics associated with the evaluation metrics below. The Order Monitor will provide a status report to the COTR and any appointed task monitors. The Government may conduct random audits of the progress reports in order to validate the accuracy of data submitted by the contractor. Other surveillance techniques may be employed if considered necessary by the Government.

Evaluation for fee purposes will be conducted at approximately 6 month intervals from the date of the contract award, or as determined by the Contracting Officer. There will be approximately 4 reporting periods based on the order period ATP – 6/30/07. These defined intervals do not preclude more frequent discussions concerning performance in the areas of technical, cost and schedule. All performance fee is paid provisionally until final verification of performance under each order.

The Order Monitor for this Order will be Lybrease Woodard. Changes in this assignment may be made as deemed necessary by the Government, with written notification of such changes forwarded to the contractor by the COTR. The Government retains the unilateral right to amend the plan at any time.

11.2 Schedule (30%)

The contractor's performance with respect to schedule shall be evaluated per the following parameters.

11.2.1 Schedule Statusing (25%)

The Contractor's timeliness in providing new forecast dates on POI tasks/milestones as defined in the POI Level III Schedule behind schedule more than 10 working days without new forecast dates for the evaluation period shall affect 5% of the performance fee per the following table:

Quantity unstateded tasks/milestones and/or tasks/milestones later than 10 working days without new forecast	Percent fee awarded
<5	25%
5-10	15%
>10	0%

Tracking shall begin after initial submission of the Project Schedule.

11.2.2 Late or Incomplete Status Deliveries (5%)

Late or incomplete delivery of weekly (project team), monthly POI progress status, quarterly status and any other management status requested by the Order Monitor during the evaluation period shall affect 5% of the performance fee per the table below:

Instances of inadequate status delivery	Percent fee awarded
<2	5%
2-3	2%
>3	0%

Inadequate delivery shall be defined as the following situations:

- >1 working days late for weekly status due at weekly team meetings (with exception of instances excused by the Order Monitor),
- > 3 working days late for Monthly Progress discussions and Monthly POI Schedule Database status

11.3 Technical Objectives (50%)

11.3.1 Maintaining Certified Flight Controllers (25%)

Maintaining certified flight controllers is critical to real-time operations and maintaining the certified flight controllers shall affect 25% of the performance fee. The requirements for flight controller certification will be established at the beginning of each evaluation period. The contractor shall maintain certified flight controllers in the flight controller and increment preparation positions. The contractor shall track the training and certification of the flight controllers through the training and certification phases. The metric below is based on the total flight certifications and will be measured for each performance fee period based upon the total number of contractor personnel that have been officially certified (X) divided by the total number of contractor personnel that have been designated to fill a console position (Y).

Maintaining Flight Controller Certification (X/Y=%)	Percent fee awarded
100%	25%
95% or above	15%
<95%	0%

11.3.2 Corrective Action (5%)

Actions collected as part of managing the POI tasks shall be tracked as corrective actions. These actions shall be defined between the POI Contractor task management and the Order Monitor and/or COTR to address project issues. This includes actions resulting from console operations events with a root cause found to be inadequate situational awareness, training, procedures, processes, flight documentation, tools, displays, or ground systems. Deficiency in completing corrective actions within 10 working days of the assigned due date without negotiation resulting in new due dates shall affect 5% of the performance fee for the evaluation period per the table below.

Quantity of incomplete scheduled corrective actions (INCOMPLETE)	Percent fee awarded
<3	5%
3-5	3%
>5	0%

11.3.3 Deliverable Quality (10%)

The quality of deliverables which are developed by the Contractor shall affect 10% of the performance fee during the evaluation period. Quality shall be assessed as the number of Technical Coordination Meetings (TCM) required to baseline a product and the ability to resolve issues prior to the Board dates for the products. Deliverable quality shall be based on the sum of points for the evaluation period per the table below.

Number of Outstanding Issues at Board	Percent fee awarded
<2	10%
2-3	5%
>3	0%

11.3.4 Ground Support Personnel Qualification and Adherence to Standards (10%)

The quality of ground support personnel qualification for test or operational support, and adherence of ground support personnel to MSFC, project, shuttle, and ISS standards shall affect 10% of the performance fee. The Government may conduct audits of logs, procedure execution notations, and training records, as well as observe operations. Deviations from baselined standard operating procedures or ground support personnel certification requirements may affect the fee for the evaluation period per the table below. These deviations include the Incident Boards convened for real time operations, Failed Certification Simulations prior to real time operations, or De-certification of certified ground support personnel during real time operations.

Number of Deviations	Percent fee awarded
<3	10%
3-5	5%
>5	0%

11.4 Cost Control (20%)

The contractor shall control cost consistent with negotiated cost. Cost Performance shall affect 20% of the performance fee and shall be based on Cost Rating (C) per the table below.

Cost Rating (cumulative), C (actual cost / negotiated cost)	Percent performance fee awarded
$C < 0.98$	20%
C between 0.98 and 1.0	$(.20)(345-250C)\%$
C between 1.0 and 1.08	$(.20)(1282.5-1187.5C)\%$
$C > 1.08$	0%