

SECTION C – STATEMENT OF WORK

Table of Contents

Scope of Work 2

1.0 Contract Management..... 2

 1.1 Management..... 2

 1.1.2 Financial Management..... 3

 1.1.3 Property Management..... 3

 1.1.4 Information Technology (IT) and Data Management..... 3

 1.1.5 Procurement 4

 1.1.6 Safety and Health..... 4

 1.1.7 Quality Management..... 4

2.0 Technical Services 4

 2.1 Analyses, Assessments, and Trade Studies..... 4

 2.2 Mishap Reporting..... 5

 2.3 Program and Project Support 5

 2.3.1 JSC and Program Boards, Panels, Reviews, Meetings, and Working Groups 6

 2.3.2 Safety Review Process..... 6

 2.3.3 Mission Planning 6

 2.3.4 Mission Support..... 6

 2.3.5 Software Assurance 6

 2.4 Quality Assurance..... 7

 2.5 Information Technology 7

 2.5.1 Database Development and Operations..... 7

 2.5.2 Website Development and Operations..... 8

 2.6 Special Projects..... 8

3.0 Institutional 8

 3.1 Facility Operations & Maintenance 8

 3.1.1 Facility Modifications..... 8

 3.2 Pressure Systems..... 8

 3.3 White Sands Test Facility (WSTF)..... 8

 3.4 Training..... 9

 3.5 Education and Outreach..... 9

Scope of Work

The Statement of Work (SOW) applies to all current and future National Aeronautics and Space Administration (NASA) Programs and Projects. This SOW and all documents referenced herein define the Government's requirements for Safety and Mission Assurance (S&MA) engineering products and services. The majority of the work is located at the Johnson Space Center (JSC) in Houston, Texas. Resident support is required at the White Sands Test Facility (WSTF) located in Las Cruces, New Mexico. Contractor services could be required at other NASA centers, contractor or subcontractor locations, or vendor facilities. This SOW provides for the review of work performed by other contractors, Commercial Partners, International Partners (IPs), and other NASA organizations.

The Contract Management section is comprised of activities that are fairly constant, predictable, and provide the framework under which work ordered by Task Orders (TOs) will occur. This section will be firm-fixed-priced and negotiated at the beginning of each contract year. All technical work will be ordered on either completion form or term form TOs. Any work associated with the technical products ordered on TOs, including the supervision of the tasks, shall be charged to the task order requesting the work. Multiple task orders may be in effect during the performance period of the contract. Travel requirements will be stated in the individual task orders, as applicable, and may be required to both domestic and foreign locations.

The structure of the SOW should not be construed as defining a required organizational configuration.

1.0 Contract Management

The contractor shall provide contract management for all aspects of this SOW.

1.1 Management

The contractor shall develop and implement management functions to ensure that all work activities are accomplished in accordance with contract provisions. The contractor shall provide and maintain management systems for the planning, organization, control, and reporting of all activities required by this contract. These systems shall assure accomplishment of technical and schedule requirements and cost objectives. The contractor shall document their management functions and systems in accordance with Data Requirement Description (DRD) 001, Contract Management Plan. The contractor's management approach shall fully integrate activities, including those of subcontractors and major vendors.

The contractor shall provide and maintain a contract Work Breakdown Structure (WBS) in accordance with DRD 002, Work Breakdown Structure and Dictionary.

The contractor shall provide reporting in accordance with DRD 003, Integrated Technical Management Report. The contractor shall conduct monthly Contract Management Reviews (CMRs) with NASA management to provide the status of the contractor's financial and technical activities under the contract.

The contractor shall develop and implement a plan to continuously identify and propose initiatives to infuse advanced technology, innovations, and industry best practices, which promote improvements in quality, capability, and overall efficiency in accordance with DRD 004, Technology, Innovations, and Process Improvement (TIPI) Plan. The contractor shall identify potential initiatives in accordance with DRD 003. Approved initiatives will be implemented through task orders.

The contractor shall develop and implement a plan in accordance with DRD 005, External Customer Plan and clause H.10, External Customer Effort, to recruit and secure external customers for the Receiving, Inspection and Test Facility (RITF). The contractor shall secure External Customers to use the excess capacity of the RITF, in order to reduce the total cost to the S&MA Directorate without compromising safety, process integrity, or infrastructure resources.

The contractor shall report potential external customers or external customer initiatives in accordance with DRD 003.

1.1.2 Financial Management

The contractor shall provide financial reporting by cost element and include subcontractor financial data. The contractor shall provide financial and supplemental reporting in accordance with DRD 006, Contractor Financial Management Report.

1.1.3 Property Management

The contractor shall perform property management and administration of all Government property acquired or in possession of the contractor and subcontractors in accordance with the property clauses of this contract. Government property provided for use by the contract in accordance with NASA FAR Supplement 1852.245-71, Installation-Accountable Government Property, will be managed and controlled in accordance with the NASA regulations specified in that clause. Direct charge property acquired or fabricated by the contractor will be managed and controlled in accordance with FAR 52.245-1 and the contractor's Government Property Management Plan as required in DRD 007. The contractor shall also provide Logistics Reporting in compliance with DRD 015. Negative reports are required.

1.1.4 Information Technology (IT) and Data Management

The contractor shall provide IT capital planning and investment control information to NASA in accordance with DRD-012, Information Technology Capital Planning and Investment Control (CPIC).

The contractor shall protect the confidentiality, integrity, and availability of NASA Electronic Information and IT resources and protect NASA Electronic Information from unauthorized disclosure. The contractor shall conduct yearly IT Security Training and coordinate with the NA/Organizational Computer Security Official (OCSO) to insure that IT policies are followed. The protection of NASA information shall extend to all NASA on-site facilities, off-site facilities, and contractor corporate areas. Specific policy guidance is documented in the Applicable Documents List (Appendix J.1).

The contractor shall develop and implement a plan in accordance with DRD 013, IT Security Management Plan. The contractor shall identify how they will protect all documents and data produced in performance of this contract in accordance with DRD 013. All data shall be organized, controlled, and stored on NASA on-site IT equipment. Proprietary or non-standard applications, protocols, or IT systems shall not be utilized without prior NASA contractual authorization.

1.1.5 Procurement

The contractor shall procure supplies, services, and materials required in the performance of the SOW. Materials are to be acquired by the contractor when essential to the task performance and are specifically approved. Title to all property purchased or fabricated by the contractor for which the contractor is entitled to be reimbursed as a direct item of cost under this contract shall pass to and vest in the Government upon the vendor's delivery of such property or completion of fabrication. The contractor shall document the transfer of materials.

The contractor shall perform the logistical and property management receiving processes for the receipt of material and equipment.

1.1.6 Safety and Health

The contractor shall comply with JPR 1700.1, "JSC Safety and Health Handbook" for work done on-site at JSC and WSTF. For work performed at other locations, the contractor shall comply with applicable safety standards. The contractor shall develop and implement a plan in accordance with DRD 008, Safety and Health Plan; conduct a self evaluation in accordance with DRD 009, Safety and Health Program Self Evaluation; and provide lessons learned in accordance with DRD 010, Lessons Learned Program Plan.

1.1.7 Quality Management

The contractor shall establish and maintain a Quality Management System (QMS) in compliance with the ISO Q9001-2008 and in accordance with DRD 11, Quality Plan.

2.0 Technical Services

The contractor shall provide technical services, products, and reporting as ordered through TOs for all S&MA technical requirements.

2.1 Analyses, Assessments, and Trade Studies

The contractor shall perform S&MA analyses, assessments, and trade studies in support of all space flight and research and development programs. Examples of analyses include safety, reliability, availability, maintainability, quality, and supportability. These analyses may include quality engineering assessments for hardware and software; qualitative and quantitative risk management analyses; hazards analyses; failure mode and effects analyses; trending analyses; and technology assurance analyses. Examples of assessments include Integrated Supplier Assurance assessments, probability risk assessments, feasibility assessments, risk mitigation assessments, ground systems and facilities assessments, and pre- and post-launch assessments. Products can include analytical math models and results including data, databases, algorithms,

and interpretation of results. The contractor shall provide documentation packages as specified in the TOs for each product.

The contractor shall develop, implement, and validate analytical tools and math models; as well as modify existing analytical tools and math models to support evolving safety and mission assurance analysis requirements. The contractor shall develop computational capabilities and modify existing computational capabilities necessary to support the generation of the safety and mission assurance analysis products. The contractor shall develop documentation on the definition, configuration, and verification of analytical math models. The contractor shall develop documentation on the configuration and verification of NASA unique and commercial off the shelf software tools. The contractor shall provide training on how to use the NASA unique software tools to perform the associated safety and mission assurance analyses.

2.2 Mishap Reporting

The contractor shall support accident, incident, and mishap investigations in accordance with NPR 8621.1, NASA Procedural Requirements for Mishap Reporting, Investigation, and Recordkeeping.

2.3 Program and Project Support

The contractor shall provide technical expertise for all of the Program life cycles in order to assure systems meet Program and Project requirements. The life cycle includes the concepts and requirements phase; design and development phase; manufacturing, test, acceptance, and delivery phase; operations and maintenance phase; and close out phase.

The contractor shall assist in the development of Program requirements; verify requirements and identify nonconformances; perform trade studies, analyses, assessments, audits, reviews, and evaluations; prepare and present reports and briefings; and participate in meetings and review boards and panels.

The contractor shall evaluate the manufacturing, testing, and refurbishment of hardware and software to ensure the delivery of products is in accordance with functional, performance, and design requirements. The contractor shall provide expertise for Electrical, Electronic, and Electromechanical (EEE) parts.

The contractor shall conduct documentation and drawing reviews, coordinate work requests, and participate in formal reviews. Examples include Manufacturing Readiness Reviews (MRRs) and Test Readiness Reviews (TRRs). The Contractor shall provide expertise for Acceptance Reviews (ARs), System Acceptance Reviews (SARs), Functional Configuration Audits (FCAs), and Physical Configuration Audits (PCAs) to assess the readiness of hardware and software for acceptance by NASA.

The contractor shall coordinate technical meetings, prepare system documentation, maintain work instructions, provide mission related products, and provide technical and administrative expertise for program reviews, design reviews, and S&MA forums.

2.3.1 JSC and Program Boards, Panels, Reviews, Meetings, and Working Groups

The contractor shall provide technical expertise for all JSC and Program forums. Examples of forums include Mission Integration and Operations Control Boards, Joint Operations Panels, Flight Operations Reviews, Increment Operations Reviews, and International Space Station Mission Management Team (IMMT) meetings.

2.3.2 Safety Review Process

The contractor shall provide technical expertise for Safety Review Panels and interpretation of safety requirements to assist with the integration of safety processes. The contractor shall recommend requirement implementations, evaluate implementation documents and waiver requests, and negotiate resolution of safety issues. The contractor shall participate in working group meetings and formal and informational reviews of documentation to assess hardware and software compliance with applicable requirements.

2.3.3 Mission Planning

The contractor shall perform evaluations of flight worthiness and readiness and generate flight assessment documentation to support Flight Readiness Reviews (FRRs). The contractor shall prepare S&MA Certification of Flight Readiness (CoFR) and Certification of Extra Vehicular Activity (EVA) Readiness (CoER) presentations for S&MA internal and Program FRRs.

The contractor shall review flight products to identify safety issues. Examples include flight rules and crew procedures. The contractor shall ensure that operational hazard controls are properly implemented. The contractor shall assist in the identification, assessment, reporting, tracking, and mitigation of risks throughout the Program life cycle.

The contractor shall support EVA mission crew training and verify EVA Assessment Team (EVAAT) crew training. The contractor shall perform, document, baseline, and maintain EVA operations risk assessments for EVAs.

2.3.4 Mission Support

The contractor shall provide technical expertise for operation of space vehicle missions including pre-flight timeline reviews, real-time console support, and post-flight activities after each flight and expedition.

The contractor shall participate in investigations of in-flight anomalies and failures, and in the implementation of resolutions and preventive or corrective actions.

The contractor shall provide real-time assessments of hazards and risks in support of contingency operations.

2.3.5 Software Assurance

The contractor shall provide facility assessments which include product and process surveillance and software assurance support for ground simulators, mission control centers, development integration laboratories, and integrated training facilities.

The contractor shall support simulation or integrated ground system testing, both pre- and post-acceptance, to assess compliance of planned simulations or integrated system testing. The contractor shall ensure NASA plans, procedures, and applicable standards for the simulator or facility are met.

The contractor shall manage and provide expertise for the development and implementation of all NASA software continuous improvement initiatives.

The contractor shall ensure that JSC procedures and controls are compliant with the Capability Maturity Model Integration (CMMI). This includes the periodic review and recommended revision to Agency and Center software policies, procedures, and standards.

2.4 Quality Assurance

The contractor shall provide technical assessments and audits through inspection, verification, and the witnessing of work and processes used in the development, manufacturing, testing, storage, handling, and shipping and receiving of hardware, software, and associated ground support equipment.

The contractor shall provide surveillance and audits for NASA contracts as defined at the TO level. Surveillance and audits shall be performed for hardware and software processes and hardware fabrication where in-line inspection is being performed by other on-site contractors.

The contractor shall maintain data for reporting and tracking of Problem Reporting and Corrective Action (PRACA) items. The contractor shall enter data, maintain, and assess JSC projects' Quality Assurance Records Center (QARC) documentation.

The contractor shall provide expertise to assess new and emerging technologies and provide recommendations to programs and projects. Example technologies include metals, welding, soldering, brazing, nonmetallic materials, Surface Mount Technology (SMT), lubrication, seals, contamination, fasteners, contamination-related environmental technology, fluids, Non-Destructive Evaluation (NDE), and Statistical Process Control (SPC).

2.5 Information Technology

The contractor shall provide technical and administrative IT services and expertise for S&MA hardware and software infrastructure. Services shall include server administration, IT security, S&MA unique desktop support, SharePoint administration, IT planning, and data management.

2.5.1 Database Operations

The contractor shall make recommendations for new database user requirements. The requirements will include justification, testing, operations, implementation, schedule, and documentation required to support data requirements. The contractor shall maintain the integrity of existing database content and provide content updates and database modifications.

2.5.2 Website Operations

The contractor shall make recommendations for new website requirements. The contractor shall maintain the integrity of existing website content and provide content updates and website modifications.

2.6 Special Projects

The contractor shall perform research, planning, designing, and execution of special projects in support of the Safety and Mission Assurance Directorate.

3.0 Institutional

The contractor shall provide technical services and products as ordered through TOs for all S&MA institutional requirements.

3.1 Facility Operations & Maintenance

The contractor shall operate the Receiving, Inspection and Test Facility (RITF) on-site. The contractor shall provide mechanical and electrical part testing, failure analysis and evaluations, and specialized training in NASA workmanship standards. The contractor shall ensure the existing American Association for Laboratory Accreditation (A2LA) and ISO/IEC 17025:2005, General Requirements for the Competence of Testing and Calibration Laboratories, accreditation is maintained for all RITF lab disciplines. Tasks may include, but are not limited to, integration of requirements; verification of operational readiness; test buildup; preparation of hardware and software interface equipment; operation and maintenance of instrumentation and control systems and software; new procedure and process development; maintenance of facility work instructions; identification and control of hazards; and mitigation of hazardous conditions which includes operations with hazardous materials such as mercury, methyl ethyl ketone, 98% sulfuric acid, and JP-8 Jet fuel. The contractor shall maintain all records associated with work performed in the RITF.

3.1.1 Facility Modifications

The contractor shall evaluate, design, fabricate, install, and test facility equipment and systems for the RITF. The contractor shall maintain and verify facility operational readiness status and verify readiness of RITF facility equipment and systems. This section pertains to end-user equipment and systems and does not apply to facility infrastructure equipment.

3.2 Pressure Systems

The contractor shall provide engineering and technical expertise for the JSC Pressure Systems Certification. Inspection personnel shall possess a commission from the National Board of Boiler and Pressure Vessels. Inspectors shall be certified by the American Welding Society to perform weld inspections.

3.3 White Sands Test Facility (WSTF)

The contractor shall provide the WSTF S&MA office with technical expertise to establish and implement policies and program requirements. The contractor shall provide engineering and technical expertise in materials and process engineering and system safety. The contractor shall provide technical expertise for the WSTF pressure systems certification program, inspection

support to flight and flight-related systems, and implementation of the safety and health requirements.

3.4 Training

The contractor shall develop technical training materials and provide training to users, civil servants, contractors, and commercial customers. Examples of training that may be required to be provided include through-hole and surface mount soldering and inspection, lithium battery handling, and electrostatic discharge (ESD) control classes. The contractor shall maintain all training records and certifications.

3.5 Education and Outreach

The contractor shall plan and implement educational and outreach activities including special projects, demonstrations, displays, special events, and presentations in support of the Safety and Mission Assurance Directorate. The contractor shall develop outreach materials including brochures, multi-media products, and exhibit materials.

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