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KLXS-II

ATTACHMENT J.01

KENNEDY LX SUPPORT CONTRACT – TWO (KLXS-II)

PERFORMANCE WORK STATEMENT (PWS)

TABLE OF CONTENTS

OVERVIEW AND INTRODUCTION 1
1.0 GENERAL CONTRACT REQUIREMENTS 1
1.1 Contract Management and Administration 1
1.2 Contract Financial Management 3
1.3 IT Management and IT Security 3
1.4 Safety and Health 3
1.5 Environmental Management 3
1.6 Security 4
2.0 PROGRAM MANAGEMENT 4
2.1 Technical and Administrative Program Support 4
2.1.1 Technical Reports, Documentation, and Presentations 4
2.1.2 Program Management Integration Support 5
2.1.3 Programmatic Strategic Integration (PSI) 5
2.1.4 Administrative Program Support 5
2.2 Program Control and Business Management 6
2.3 Assessments and Statistical Measurements 7
2.4 Risk Management 7
2.5 Information and Configuration Management (ICM) 8
2.6 Strategic Communications Planning 9
2.7 Education and Public Engagement 9
2.8 Program Specific IT Support 10
3.0 CROSS-CUTTING FUNCTIONS 12
3.1 Schedule Integration and Analysis 12
3.2 Technology Integration 13
3.3 Logistics Management and Integration 13
3.4 Eastern Range Support 14
3.5 Safety and Mission Assurance (S&MA) 15
4.0 TECHNICAL INTEGRATION AND MANAGEMENT 15
4.1 Technical Integration 15
4.2 Technical Management 16
4.3 Architecture Integration and Management 17
5.0 FLIGHT SYSTEMS AND OPERATIONS INTEGRATION (FS&OI) 17
5.1 Operations Integration 17
5.2 Spacecraft, Launch Vehicle and Ground Systems Operations Planning and Development 18
6.0 PROJECT MANAGEMENT AND PROJECT INTEGRATION 19

Data Requirements List

Contract Management and Administration (CMA)

1. DRD CMA-01: Contract Management Plan
2. DRD CMA-02: Technical and Cost Plan
3. DRD CMA-03: Contract Transition (Phase-out) Plan
4. DRD CMA-04: Organizational Conflict of Interest (OCI) Mitigation Plan
5. DRD CMA-05: Small Business Data Reporting
6. DRD CMA-06: Equal Employment Opportunity Report
7. DRD CMA-07: Advanced Notification of Workforce Reductions Report
8. DRD CMA-08: Records Management Program Plan
9. DRD CMA-09: Summary of Records Holdings Transfers (File Plan)

Financial Management (FM)

10. DRD FM-01: Wage/Salary and Fringe Benefit Data
11. DRD FM-02: NASA Form 533 Cost Reporting
12. DRD FM-03: Monthly Financial Management Report
13. DRD FM-04 Monthly Status Report

Information Technology (IT)

14. DRD IT-01: IT Security Management Plan
15. DRD IT-02 IT Security Plan
16. DRD IT-03 IT Software Management Plan

Security (SEC)

17. DRD SEC-01: Security Plan
18. DRD SEC-02: Emergency Management Plan
19. DRD SEC-03: Export Control Plan

Program Management (PM)

20. DRD PM-01: Program Financial Analysis
21. DRD PM-02: Project Metrics

OVERVIEW AND INTRODUCTION

The Kennedy Ground Systems Development and Operations (GSDO) Program (LX) Support Services Contract-Two (KLXS-II) provides engineering and technical services, program and business management support services, and administrative support services to the GSDO Program. The scope of this contract includes supporting ground systems and space flight systems planning and design; project management and integration; operations integration and analysis; technical requirements development, management, and compliance; and cost, risk, and schedule integration and analysis.

The KLXS-II requirements are in support of the GSDO mission goals as provided by Exploration Systems Development (ESD) and include ground systems development and operational planning for launch vehicles, spacecraft and payloads. KLXS-II support for GSDO ground systems development and operational planning crosses multiple projects and Programs including 21st Century Space Launch Complex (21CSLC), Space Launch System (SLS), and Orion.

Contract activities will be performed in the most cost-effective and efficient manner supporting NASA's priorities for safety, mission success, customer satisfaction, and innovation while maintaining flexibility and responsiveness to changing requirements.

1.0 GENERAL CONTRACT REQUIREMENTS

The general requirements outlined below are applicable to all functions identified in this Performance Work Statement (PWS).

1.1 Contract Management and Administration

The Contractor shall:

A. Perform the services and deliver the products required by this contract including the PWS, contract terms and conditions, Data Requirement Descriptions (DRDs) (Attachment J.02), and Applicable Documents List (Attachment J.06).

B. Institute and maintain an effective, efficient, and responsive organization responsible for management and oversight of contract personnel and other resources, contract performance, deliverables, and cost.

C. Have the capability to reach back for, or obtain, additional subject matter expertise as necessary without impacting GSDO's mission or operations.

D. Establish and maintain team-oriented working relationships with NASA at all levels in the organization. Through formal and informal interaction, the Contractor shall work with NASA counterparts to ensure requirements are clearly communicated, mutually understood, and satisfied. At NASA's discretion, when possible, Contractor personnel will be physically co-located with NASA counterparts.

E. Inform the Contracting Officer's Representative (COR) and Contracting Officer (CO) of problems that may impact the timely, cost effective, and safe delivery of quality products and services under this contract.

F. Update, create, comply with, and maintain Standard Operating Procedures (SOPs) and other procedural guides pertaining to the KLXS-II Contract. Written procedures developed by the Contractor for this contract shall be approved by the National Aeronautics and Space Administration's (NASA) prior to implementation.

G. Manage within NASA provided travel and training budget for KLXS-II

   1. Travel when requested by NASA in support of technical and programmatic meetings or to attend specialized training.

   2. Participate in required training sessions.

H. Participate in monthly and annual performance reviews with NASA to review contract status/progress and address issues and/or concerns.

I. Provide NASA unrestricted access to all data generated or compiled in the performance of this contract, to include Information Technology (IT) systems access, and shall respond within a reasonable amount of time to NASA requests for data that is not immediately available.

J. Manage, control, and report on all KLXS-II subcontracted work.

K. Provide a *Contract Management Plan* per DRD CMA-01.

L. Provide a *Technical and Cost Plan* in accordance with DRD CMA-02.

M. Provide a *Contract Transition (Phase-out) Plan* in accordance with DRD CMA-03.

N. Provide an *Organizational Conflict of Interest (OCI)* Mitigation *Plan* in accordance with DRD CMA-04. This plan shall describe the processes and plans used by the Contractor to ensure avoidance and mitigation of any OCIs.

O. Provide information pertaining to small business goals, subcontracting performance data, and commitment to meeting goals in accordance with DRD CMA-05, *Small Business Data Reporting*.

P. Provide an *Equal Employment Opportunity Report* in accordance with DRD CMA-06.

Q. Provide an *Advanced Notification of Workforce Reductions Report* in accordance with DRD CMA-07.

R. Provide a *Records Management Program Plan* in accordance with DRD CMA-08.

S. Provide a *Summary of Records Holdings Transfers (File Plan)* in accordance with DRD CMA-09.

1.2 Contract Financial Management

The Contractor shall:

A. Deliver *Wage/Salary and Fringe Benefit Data* in accordance with DRD FM-01.

B. Develop, implement, and maintain a contract financial system to report resources by the contract Work Breakdown Structure (WBS) and elements of cost such as labor, overhead, other direct costs (e.g., travel and subcontracts), and indirect costs in accordance with DRD FM-02, *NASA Form 533 Cost Reporting*.

C. Provide a *Monthly Financial Management Report* in accordance with DRD FM-03.

D. Provide a *Monthly Status Report* in accordance with DRD FM-04.

1.3 IT Management and IT Security

The Contractor shall:

A. Develop, maintain, and secure information systems that provide for the management, preparation, publication, control, and dissemination of information and data required by this contract, in accordance with Federal Information Security Management Act (FISMA), NASA Procedural Requirement (NPR) 7120.7, *NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements*, and NPR 1382.1, *NASA Privacy Procedural Requirements*.

B. Develop, implement, and maintain DRD IT-01, *IT Security Management Plan*; DRD IT-02, *IT Security Plan;* and DRD IT-03, *IT Software Management Plan*.

C. Ensure compliance with the Agency User Authentication requirements for application single sign-on access to all functionality for which the users have permissions in accordance with NPR 2841.1, *Identity, Credential, and Access Management*.

D. Incorporate IT security requirements at all phases of the System Development Life Cycle (SDLC) in accordance with NPR 2810.1, Security of Information Technology.

1.4 Safety and Health

The Contractor shall ensure compliance with pertinent NASA and John F. Kennedy Space Center (KSC) safety and health policies and requirements.

1.5 Environmental Management

The Contractor shall ensure compliance with Kennedy NASA Procedural Requirements (KNPR) 8500.1, *KSC Environmental Requirements*. The Contractor shall incorporate sustainable elements and practices in operations in accordance with EO 13514, *Federal Leadership in Environmental, Energy and Economic Performance,* including areas of energy efficiency, use of renewable energy, reduction in water consumption intensity, acquisition of green products and services, pollution prevention, waste prevention, recycling and waste diversion, use of alternative fuel vehicles and alternative fuels and electronic stewardship.

1.6 Security

The Contractor shall:

A. Develop, implement, and maintain a *Security Plan* in accordance with DRD SEC-01 to ensure compliance with all NASA and KSC security policies and requirements.

B. Develop, implement, and maintain an *Emergency Management Plan* in accordance with DRD SEC-02.

C. Develop, implement, and maintain an *Export Control Plan (ECP)* in accordance with DRD SEC-03.

D. Provide an organizational point of contact (POC) to interface with the NASA Protective Services Office and the Kennedy Protective Services Contractor personnel to enable security-related activities (e.g., coordinating badging for Contractor personnel) in accordance with KNPR 1600.1, *KSC Security Procedural Requirements*.

2.0 PROGRAM MANAGEMENT

The Contractor shall create Technical Reports as required by the different GSDO functional offices and as needed to meet the PWS requirements in this section in accordance with Appendix B, *Technical Reports*.

2.1 Technical and Administrative Program Support

2.1.1 Technical Reports, Documentation, and Presentations

The Contractor shall:

A. Develop, review, present, and maintain materials, analyses, and other documentation for internal and external GSDO presentations, communications, meetings, and reviews as designated by NASA. Ensure consistency of technical and programmatic content.

B. Prepare and present various topics such as technical, cost, and schedule status; specific safety or risk issues; and responses to external inquiries.

C. Provide technical writing capabilities to assist GSDO in preparing and reviewing both internally and externally generated documents.

D. Support development of GSDO planning approaches, formulation, and maintenance of documentation (e.g., Program Plan development, working group charters, and transition planning documents).

E. Assist GSDO in documenting and ensuring compliance with NPR 7120.5, *NASA Space Flight Program and Project Management Requirements*, and NPR 7123.1, *NASA Systems Engineering Processes and Requirements*, which includes planning for the next life cycle and identifying specific products required.

F. Assist in developing external commitment documentation such as Decision Memorandums and Program Commitment Agreements.

2.1.2 Program Management Integration Support

The Contractor shall:

A. Develop and integrate reporting products (e.g., technical, risk, schedule, and cost assessments) necessary for monthly Program Management Reviews, working in coordination with appropriate IPT leads, EITs, and functional managers. In addition, the Contractor shall review associated risks, problems, and issues with the appropriate IPT lead, EIT, and functional manager.

B. Coordinate and integrate data to support weekly, monthly, and quarterly reporting activities (e.g., technical achievements, performance metrics, schedules, and issues).

C. Integrate material necessary for weekly status notes from the AIT members, IPT leads, EIT members, and functional managers to the Program Manager which will then be reported to the Center, ESD or other external entities.

2.1.3 Programmatic Strategic Integration (PSI)

The Contractor supports GSDO PSI activities in support of the integrated Programmatic and Program Control Integration Team (iPIT) and GSDO supported iPIT working groups.

Based upon knowledge of Program milestones, operational processing flows, and ground systems designs, the Contractor shall:

A. Support planning, coordination, and development of programmatic products to include integrated costs and budgets, integrated schedules and interdependencies, risk assessments, education and public engagement activities, and Program life cycle milestone events.

B. Ensure the consistency, integration, and continuity of programmatic content across Programs (GSDO, SLS, Orion) regarding cost, schedules, interfaces/ interdependencies, risks and impact assessments.

C. Track changes to programmatic products and communicate status to various levels of management.

2.1.4 Administrative Program Support

The Contractor shall:

A. Provide administrative support to GSDO-related boards, panels, reviews, and working groups to include:

   1. Document agendas and minutes.

   2. Track action items through closure.

3. Communicate and distribute data items for: information, review, Review Item Discrepancy (RID)/Request for Action (RFA) processing, and storing that documentation within Microsoft SharePoint and/or applications (e.g., Integrated Collaborative Environment [ICE]).
4. Coordinate teleconferences, video conferences, conference rooms, and utilize information sharing applications (e.g., WebEx).
5. Maintain Program-related records.

B. Assist GSDO in planning, scheduling, and coordinating all office movement of GSDO personnel (civil servant and any GSDO support contractor).

2.2 Program Control and Business Management

The Contractor shall:

A. Provide cost analysis and financial management services on NASA and GSDO contractors' reports based upon knowledge of Program milestones, operational processing flows, and ground systems designs. This includes cost estimation, budget formulation and execution, earned value management (EVM) (or other performance measurement if EVM is not required).

B. Provide integrated Program cost/schedule assessment reports, analyses, and products incorporating EVM (or other performance measurement if EVM is not required) reporting.

C. Deliver cost analysis and financial management products and services in accordance with DRD PM-01, *Program Financial Analysis*.

D. Support the development, integration, review, justification, validation, and management of annual Planning, Programming, Budgeting and Execution (PPBE) and interim budgets and other budget development activities and life-cycle cost estimates; cost risks and threats; ground rules and assumptions; tracking planned versus actual expenditures; and decision packages.

E. Perform ad hoc analyses and assessments which include parametric cost estimates, schedule, cost, requirements, workforce correlations and analysis, life-cycle cost estimates, and trade studies.

F. Perform cost estimating tasks including:

1. Selection of, and recommending improvements to, cost estimating methodology.
2. Selection of cost model.
3. Development of approaches for life-cycle cost estimation.
4. Analysis of existing cost estimating models.
5. Documentation of cost and risk analyses.
6. Development of basis of estimates.

G. Perform cost assessments including review of cross-Program Change Requests (CRs) for life-cycle cost impacts, development of annual Program cost estimates, achievability assessments, confidence level analyses, and review of project financial products.

H. Develop, integrate, and manage GSDO business processes in order to improve the effectiveness and efficiency of the implementation of assigned work. Specific efforts include:

1. Formalizing and refining GSDO business processes.
2. Identifying how the GSDO offices interface, manage, and share information with internal and external customers.
3. Identifying deficiencies and recommending process improvements.
4. Developing improved business practices and plans to mitigate identified deficiencies.

2.3 Assessments and Statistical Measurements

The Contractor shall:

A. Develop GSDO Program metrics, probabilistic risk analysis and schedule risk analysis, and data in accordance with DRD PM-01.

B. Assist the GSDO Independent Assessment Team (IAT) in developing recommendations as to whether the GSDO Program can be successfully executed within available resources and applicable constraints, and provide cost reduction recommendations.

C. Assist the IAT in performing cost and schedule analyses to include cost and schedule uncertainty analysis, development of joint confidence levels, analysis of existing cost estimating models, documentation of basis of estimates, quantitative risk analyses (QRAs), and schedule assessments.

2.4 Risk Management

The Contractor shall:

A. Provide risk management support in the form of documentation, training, database management, board support and analysis, representation at boards and panels, and special assessments utilizing GSDO risk management tools, including Active Risk Management (ARM), ThinkTank, and SharePoint.

B. Support and maintain the GSDO Program and Project Risk Management process, including the identification and quantification of cost threats within the risk system and participation in GSDO risk reviews and assessments at all levels.

C. Participate in the integrated Risk Working Group, the Project Risk Working Groups, Project Risk Review Panels, and GSDO and IPT Risk Reviews. Participation includes identification, analysis, and tracking of GSDO risks.

D. Maintain the GSDO Risk Management Plan and processes, updating as necessary to reflect any findings or recommendations relative to periodic risk reviews, system safety

reviews, quantitative risk assessments, operation risk management, risk-based acquisition management, and information management systems for problem reporting, surveillance reporting, supportability data, and trends analyses.

E. Identify, evaluate, track, and report planning and assessment issues to the appropriate managers with recommendations and mitigation plans for resolving risks.

2.5 Information and Configuration Management (ICM)

The Contractor shall:

A. Perform Configuration Management (CM) and Data Management (DM) planning, configuration identification, configuration control, configuration status accounting, and configuration verification in accordance with GSDO-PLN-1001, *Ground Systems Development and Operations Program Information and Configuration Management Plan* (ICM Plan).

B. Maintain the GSDO ICM Plan and incorporate additions and/or updates to GSDO CM policies, procedures, and requirements.

C. Manage access control to various CM databases (e.g., ARM and Cradle) for requirements management, to coordinate training, and to interface with other Centers and institutional KSC organization databases (e.g., Windchill, and Document and Data Management System [DDMS] hosted at the Marshall Space Flight Center [MSFC]) for GSDO.

D. Provide CM/DM and process customization recommendations for Operations and Maintenance Requirements and Specifications (OMRS), Launch Commit Criteria (LCC), and RID tools; support training and database updates.

E. Provide DM products and services (e.g., ensure data compatibility, data item receipt, release, approval process, and standardized taxonomy) for the data/information architecture and management requirements.

F. Coordinate the disposition of CRs and ground systems studies with the appropriate Configuration Control Board (CCB) to include the KSC institutional and GSDO contractors.

G. Maintain existing documentation and provide the library functions to catalogue, store (hardcopy and electronic), maintain and provide access to Acceptance Data Packages (ADP).

H. Operate a CM Receipt Desk that includes the following functions:

1. Provide a single POC for GSDO receipt desk processing to various other CM Receipt Desks operated by NASA and contractors.
2. Disseminate meeting notices, agendas, and CR packages to the Government and contractors.
3. Request inputs (e.g., impacts and comments) on CR packages from the Government and contractors.

4. Maintain a CM action tracking log to include pertinent information such as the responsible lead organization, action disposition, distribution, due date, and closed items.
5. Consolidate the impacts and comments received from the Government and contractors to CR packages.
6. Transmit NASA-approved impacts and comments back to the controlling Program CM Receipt Desk.
7. Generate and maintain evaluation forms for each applicable change as coordinated with the designated KSC CM representative.

2.6 Strategic Communications Planning

The Contractor shall:

A. Assist in developing and maintaining a Strategic Communication Plan to convey GSDO capabilities and plans through various media to designated audiences.

B. Assess the current business environment, national space policy, and other areas deemed appropriate in order to identify and expand the GSDO target market through effective communication. In addition, the Contractor shall create and maintain marketing products highlighting GSDO Program services and skills.

C. Participate with GSDO, ESD, Human Exploration and Operations (HEO) Mission Directorate (MD), and other potential Government and commercial customers to benchmark the domestic and international launch processing environments, as well as assess the range of KSC capabilities to enable GSDO to meet emerging demands.

2.7 Education and Public Engagement

The Contractor shall:

A. Assist in developing GSDO's public engagement plan in order to generate awareness and inspire students, teachers, and the general public about the GSDO Program and how the world benefits from United States (US) space exploration achievements.

B. Prepare, organize, maintain, and report trending data, spreadsheets, and metrics for the GSDO Program outreach, including support to schools, public engagement events, and employee morale efforts.

C. Create, maintain, organize and report metrics for the GSDO Program outreach surveys to assist in evaluating the effectiveness of the outreach program.

D. Develop and maintain spreadsheets of participating schools and identify target schools to maximize the impact of Science, Technology, Engineering and Math (STEM) outreach activities.

E. Support outreach activities to both schools and public engagement events.

F. Prepare and deliver outreach packages containing mission patches, lapel pins, and other mission related items for schools, conferences, and events.

G. Schedule GSDO outreach and strategic communication meetings, and maintain meeting minutes and actions assigned.

H. Assist in preparing and coordinating GSDO event displays.

I. Adjust, implement, and maintain financial tracking system capable of tracking outreach accounts. Provide budget planning for GSDO Program outreach projects.

2.8 Program Specific IT Support

The Contractor shall:

A. Provide GSDO IT property management support to include:

1. Manage the electronic equipment in conference rooms and other common locations.

2. Assist the GSDO IT property custodian in maintaining GSDO IT inventory (e.g., smart phones, USB drives, and laptops), and tracking the shared hardware/software equipment pool. GSDO IT inventory shall be documented within the IT Security Enterprise Data Warehouse (ITSEC-EDW).

3. Assist the GSDO IT property custodian in coordinating office IT equipment moves (e.g., computers and phones) affecting both NASA civil servants and any contractor personnel supporting GSDO.

4. Serve as the primary POC for IT loan pool services and provide the following services for GSDO personnel (civil servants and contractors):

- Develop and maintain user guides/desktop instructions for services that require user self-installation for non-Agency Consolidated End-user Services (ACES) provided services.
- Develop procedures for appropriate property management of the loan pool products for check-in/check-out and conducting regular inventories.
- Ensure Contractor personnel are trained to use NASA provided software.

B. Provide GSDO IT office automation support to include:

1. Assist in the development, maintenance, and communication of the GSDO IT processes.

2. Manage and maintain access to GSDO information and data on websites, portals, and other media. Responsibilities include responding to feedback, recommending and coordinating usability, and implementing improvements/changes.

3. Develop content for populating GSDO websites, portals, and other media.

C. Provide GSDO IT support for program management, finance, and cost control to include:

1. Develop, populate, and maintain an automated repository containing GSDO budgets allowing ad-hoc queries and report writing.

2. Assist GSDO in developing, refining, and implementing the EVM (or other performance measurement if EVM is not required) system and processes.

3. Assist GSDO in the identification and implementation of automated program management tools.

D. Provide GSDO IT DM support to include:

1. Maintain an automated process for DM for tracking, monitoring, and validating all GSDO contract deliverables. This shall include distribution, status, and storage.

2. Provide the structuring of and access to data within GSDO Contractor developed systems/tools as well as recommendations for and execution of the most effective information and DM practices.

3. Provide the capability to define and execute methodologies that access the data residing within GSDO Contractor developed/provided IT systems.

E. Develop, operate and maintain software tools (e.g., Resource Environment for Enhanced Budgeting [REEB] and Ground Operations Planning Database [GOPDb]).

F. Maintain a record of security issues, problems, and resolutions for GSDO IT systems.

G. Serve as the GSDO Organizational Computer Security Representative (OCSR). The GSDO OCSR shall assist the GSDO Organizational Computer Security Officer (OCSO) to ensure the elements of the NASA IT Security Program are implemented.

1. Assist in establishing management controls and a communication process to ensure that the GSDO implementation of IT security is consistent with mission needs and NASA policies, standards, procedures, and guidance.

2. Conduct, with the OCSO, the review of the GSDO IT system security plans and maintain status information in the Center's IT security related databases.

3. Provide the coordination and consolidation of responses to IT and IT security related actions, metrics, and the status of activities.

4. Provide or assist with the Office of Management and Budget (OMB) FISMA reporting metrics for systems owned by GSDO as required by the Agency Office of the Chief Information Officer (CIO), to include:

- IT system vulnerability scan and mitigation
- Agency Security Update Services (ASUS)
- ITSEC-EDW
- Agency Security Configuration Standards (ASCS)
- NASA Security Accreditation and Authorizations System (NSAAR)
- IT system and software application registration, continuous monitoring, and annual contingency plan testing requirements

5. Support IT security incident response, incident investigation, and reporting in accordance with the Center and Agency standards and processes.

3.0 CROSS-CUTTING FUNCTIONS

The Contractor performs cross-cutting functions or tasks that span across all aspects of the GSDO Program to achieve its technical baseline.

The Contractor shall create Technical Reports as required by the different GSDO functional offices and as needed to meet the PWS requirements in this section in accordance with Appendix B.

3.1 Schedule Integration and Analysis

The Contractor provides task level schedules for each Fiscal Year (FY). This includes GSDO Program, IPT, and Element level schedules in support of planning, risk analysis, and decision-making activities.

The Contractor shall:

A. Develop, integrate, maintain, and provide detailed GSDO Program, Element, and IPT level schedules in accordance with Appendix C, *Schedule Analysis and Metrics*.

B. Develop and maintain these schedules using a software suite specified by NASA (e.g., Primavera). Train personnel (both GSDO contractor and NASA personnel) in the use of the software suite.

C. Integrate and analyze cost-loaded, critical path, and external interface linked schedules from multiple sources into a single master GSDO schedule. Sources include the GSDO AIT, IPTs, and EITs; and organizations providing direct support to GSDO.

D. Integrate and maintain Element-to-Element schedules and their associated project schedules. This includes developing and maintaining the interdependencies matrix.

E. Perform and provide analysis of schedules based upon knowledge of Program milestones, operational processing flows, and ground systems designs. Evaluate the validity of proposed schedules as well as performance to date; assess feasibility of success; and identify gaps, inconsistencies, efficiencies, and risks. Evaluate critical milestones and milestone hierarchy against existing schedules; identify critical path and schedule risks; and report findings of those analyses.

F. Maintain and update the GSDO Integrated Master Schedule Plan.

G. Develop recurring GSDO Program, IPT, and Element schedules to support studies. This includes special schedule “what-if” scenarios to facilitate analysis of ground systems and ground processing alternatives and options.

H. Document and present analysis results and recommendations.

I. Maintain configuration control over schedules and resource data.

3.2 Technology Integration

The Contractor assists in identification of new technology needs within GSDO and communication of those needs to NASA technology development organizations.

Based upon knowledge of GSDO milestones, operational processing flows, and ground systems designs, the Contractor shall:

A. Support GSDO technology development by planning and implementing an integrated approach within the AIT structure for identifying new technology needs.

B. Provide a GSDO presence at technology development forums at KSC and within HEO.

C. Coordinate GSDO technology development activities as follows:

   1. Establish a customer relationship with technology development teams on behalf of GSDO to help mitigate developmental and operational risks.
   2. Review and assess technology development progress reports and integrate status into GSDO products and schedules.
   3. Identify, coordinate, and document GSDO technology development needs for inclusion into programmatic reviews and products.

3.3 Logistics Management and Integration

The Contractor supports the management and integration of GSDO logistics for development activities and planning for future operations.

The Contractor shall:

A. Support project management activities by assisting with logistics documentation development and reviews; risk assessment and mitigation planning; development and tracking of metrics; and development and updates of an integrated logistics schedule.

B. Support monitoring and review of design support activities, including Logistics Support Analysis (LSA), and provide interface to the KSC organizations.

   Note: This task aids in performing assessments and determining procurement strategies.

C. Support GSDO logistics activities by performing and presenting/delivering various logistics studies such as facility optimization, cost estimations, and cost trade analyses as well as flight hardware recovery and transportation.

D. Support requirements development and planning for operational logistics to include:

   1. Packaging, handling, storage and transportation (PHS&T)
   2. Technical training
   3. Inventory management

4. Supply support
5. Maintenance planning

E. Review and provide input to cross-Program logistics products and processes.

F. Support the Cross-Program Logistics Integration Team efforts, which include development of integrated plans and agreements.

G. Support a variety of GSDO Program and Element meetings and teleconferences, some requiring travel (e.g., GSDO Program milestone reviews such as Preliminary Design Review [PDR], Critical Design Review [CDR], and Operations Readiness Review [ORR]; monthly reviews; and relevant GSDO Program/IPT/EIT Boards).

3.4 Eastern Range Support

The Contractor shall:

A. Provide Eastern Range technical expertise to include vehicle flight safety systems, ground systems, and operations.

1. Participate in Human Exploration Range Safety meetings (e.g., panels and working groups) which include cross-Program representatives.
2. Coordinate interaction with the Eastern Range for development of ground systems and operations related to flight safety systems and range safety.
3. Coordinate interaction with the Eastern Range to optimize Department of Defense (DoD) and Eastern Range support.
4. Participate in forums with other agencies and entities such as:
   - The Air Force Space Command, Air Force Space and Missile Systems Center, and the Eastern Range to provide technical expertise related to the Eastern Range architecture and capabilities required to support Government or commercial launch systems.
   - Space Florida and Federal Aviation Administration (FAA) in order to facilitate the interface between GSDO and potential users of GSDO services in ground systems development or ground operations.

B. Support documentation development and review activities to include:

1. Tailoring of Air Force range safety requirements for the volumes assigned to GSDO.
2. Assessing Eastern Range architecture and capabilities required to support Government or commercial launch systems.
3. Reviewing and providing input to flight safety systems, ground operations, cross-Program documentation, ground systems, and ground operations related to flight safety systems and range safety requirements.
4. Reviewing and providing schedule and risk input regarding joint use of support systems with DoD including telemetry, communications, weather services, command and control, tracking, and flight safety systems.

3.5 Safety and Mission Assurance (S&MA)

The Contractor shall:

A. Develop and provide S&MA GSDO related documentation (e.g., Process Requirement Documents (PRDs) and GSDO Program Plans).

B. Develop and provide S&MA GSDO related products (e.g., schedules and plans for Program safety and quality process requirements implementation, GSDO Program and contractor reviews, and identify and prepare GSDO S&MA risks).

4.0 TECHNICAL INTEGRATION AND MANAGEMENT

The Contractor provides engineering integration, analysis, and documentation services based upon knowledge of GSDO milestones, operational processing flows, and ground systems designs.

The Contractor shall create Technical Reports as required by the different GSDO functional offices and as needed to meet the PWS requirements in this section in accordance with Appendix B.

4.1 Technical Integration

The Contractor shall:

A. Maintain and provide updates to the requirements definition and management processes and plans.

B. Support the development and documentation of the GSDO Program and IPT level requirements. This includes requirement analysis from other Programs and applicable NASA and industry standards.

C. Support the management of the GSDO Program and IPT level requirements. This includes the traceability, documentation, tracking, and technical impact assessment of change at all levels.

D. Provide integrated assessments, reports, metrics, and analysis regarding GSDO systems and interface requirements.

E. Perform technical assessments which include analyzing proposed changes to the technical baseline and trade studies. These assessments shall be a complete integrated package consisting of all required information such as: assessment request, current baseline, concept of operations, requirements, assumptions, vehicle configuration, manifests, development and operational impacts, risks, and cost/schedule variance impacts.

F. Support cross-project technical integration to include ensuring the continuity of technical content across projects regarding requirements, interfaces, designs and impact assessments.

G. Support subsystem design reviews to ensure design compliance to requirements and identify issues with implementation of GSDO technical requirements.

H. Support the identification, tracking, mitigation, and reporting of issues identified during all phases of the program life cycle (e.g., development, verification and validation [V&V], and operations).

I. Support the development and management of GSDO Interface Requirement Documents (IRDs) and Interface Control Documents (ICDs). This includes ensuring the technical accuracy of the requirements, philosophical consistency, tracking and reporting issues, ensuring communication to all affected parties, and providing recommendations and presentations.

J. Support GSDO Cross-Program Systems Integration (CSI) activities in support of the Cross-Program Integration Team (CPIT) including its integration task teams. This support includes:

   1. Coordinate and support the planning, development and implementation of systems engineering products such as operations concepts, ground systems requirements, ground hardware integration, IRDs, ICDs, requirements V&V, trade studies, functional analyses, and systems engineering processes.

   2. Ensure the consistency, integration, and continuity of technical content across Programs including requirements, interfaces, designs and impact assessments.

   3. Track changes to systems engineering and integration products and communicate status to various levels of management.

4.2 Technical Management

The Contractor shall:

A. Assess and provide recommendations to GSDO functional managers for updating the GSDO Program technical documentation based on current baselines, processes, and plans.

B. Support the development, integration, administration, and maintenance of technical management processes and tools (e.g., Systems Engineering Management Plan [SEMP], OMRS, V&V process).

C. Support the planning, development, and the execution of systems engineering management functions for developing and operating ground and flight systems.

D. Support the planning, integration, and execution of GSDO Program milestones such as PDR, CDR, Design Certification Review (DCR), Systems Integrated Review (SIR), System Acceptance Review (SAR), ORR, Flight Readiness Review (FRR), and operational milestones.

E. Provide Systems Engineering support to technical reviews, control boards, and Technical Interchange Meetings (TIM).

F. Support the integration of cross-Program system engineering processes and forums.

4.3 Architecture Integration and Management

The Contractor shall:

A. Provide engineering services for process definition, planning, and management of architecture assessments.

B. Assess and provide recommendations for updating/modifying the GSDO architecture portion of the Architecture and Concept of Operations (ACO) document to include analysis of architecture and operational concepts; and analysis of ground systems functional allocations, ground systems Element configuration concepts, inter-Element interfaces, and external interfaces.

C. Participate in TIM activities as required to provide lessons learned and relevant experience from previous payload, spacecraft, and launch vehicle Programs.

5.0 FLIGHT SYSTEMS AND OPERATIONS INTEGRATION (FS&OI)

The Contractor shall create Technical Reports as required by the different GSDO functional offices and as needed to meet the PWS requirements in this section in accordance with Appendix B.

5.1 Operations Integration

The Contractor shall:

A. Provide operations recommendations for Element-level requirements development, allocation, management, test and verification; and operations planning, analysis and integration.

B. Support the Integration Operations Manager (IOM) in execution of the IPTs and EIT functions.

C. Examine operational approaches to determine opportunities for cost, risk, and schedule efficiencies (e.g., optimal use of existing infrastructure, optimal processing, and launch vehicle and spacecraft processing). The results shall be documented as a study, white paper, or report.

D. Maintain, assess and provide recommendations for updating/modifying the GSDO Concept of Operations (ConOps) portion of the ACO document to include analysis of operational concepts, and analysis of ground systems design and operations changes. In addition, align with SLS and Orion ConOps as appropriate per the GSDO Technical Baseline.

E. Support Integrated Test Verification and Validation (ITV&V) integration and planning to include:

   1. Requirements development.

2. Development and reporting of program deliverables (e.g., Master Verification and Validation Plan [MVVP] volumes).
3. Test objective evaluation and product development.
4. Review of GSDO, SLS, and Orion documentation relative to V&V guidelines and policies.
5. Requirements and objective closure and reporting.
6. Program level test schedule integration.

F. Support the development, planning and management of OMRS requirements and LCC. This includes recommending appropriate requirements.

G. Support Certification of Flight Readiness (COFR) planning, and review preparation and integration.

H. Support the PPBE preparation which includes forecasting GSDO Program budgets over a multi-year horizon.

I. Assist in the development of GSDO timelines for both offline and integrated processing.

J. Provide engineering assessment services for programmatic and project risk reduction as it pertains to operations.

K. Perform the following:

1. Discrete Event Simulation (DES) utilizing Arena software for operational analysis such as critical path analysis, launch availability or processing throughput.
2. Reliability, Maintainability and Availability (RMA) analysis.
3. GOPDb and timeline updates and analysis.

5.2 Spacecraft, Launch Vehicle and Ground Systems Operations Planning and Development

The Contractor provides support and integration for ground operations concepts and enables operations planning and integration of Government (e.g., SLS and Orion) and commercial users.

The Contractor shall:

A. Develop and evaluate operational concepts, documentation, and processing approaches. Evaluations shall consider operability, resources, logistics, and timelines to meet GSDO Program milestones efficiently.

B. Support the Element Operations Manager (EOM) in execution of the EIT functions.

C. Support integration of flight systems, operational concepts, facilities, facility systems, and Ground Support Equipment (GSE).

D. Support interfacing with SLS Program including liaison support, design reviews, integration, and analysis of flight and ground hardware. SLS analyses shall be integrated across the IPTs.

   Note: Examples of SLS Program flight elements include stages, boosters, avionics, payload integration, encapsulation, and engines.

E. Support interfacing with Orion Program including liaison support, design reviews, integration, analysis of flight and ground hardware, and landing and recovery planning and coordination with other Governmental organizations.

   Note: Examples of Orion Program flight elements include the Crew Module, Service Module, Spacecraft Adapter, and Launch Abort System (LAS).

F. Support the development and evaluation of GSDO operational requirements for launch vehicle and spacecraft processing.

G. Support the development and evaluation of GSE and ICD documentation for launch vehicle and spacecraft processing.

6.0 PROJECT MANAGEMENT AND PROJECT INTEGRATION

The Contractor supports the overall project management and project integration of ground elements and associated ground systems projects from the EIT/project level to the IPT and Program levels. The Contractor supports, develops, and maintains EIT, IPT, and Program level requirements, technical assessments, and the verification phases for ground systems projects. Examples of ground elements include the Vehicle Assembly Building (VAB), launch pad, mobile launcher, offline processing facilities, landing and recovery GSE and facilities, Launch Control Center, and Command and Control systems.

The Contractor shall create Technical Reports as required by the different GSDO functional offices and as needed to meet the PWS requirements in this section in accordance with Appendix B.

The Contractor shall:

A. Provide project management to ground systems development, management, fabrication and construction through turn-over to Operations and Maintenance (O&M) organizations.

B. Support NASA Element Project Managers (EPMs) in the daily management of projects from initiation, planning, execution, and monitoring through closure.

C. Provide project management support services to include:

   1. Technical performance evaluations, schedule analysis, budget development and tracking, measuring planned versus actual milestones and tracking critical paths, change management, variance analysis/assessments, and change assessments.

      Note: Development project schedules are created by the Engineering Support Contract (ESC) or successor contractor.

2. Project planning for various ground elements and respective ground systems projects.

3. Updating project WBSs.

4. Manage performance of and deliver studies and assessments to support project planning and change requirements. Review the technical, cost, and schedule aspects of programmatic trade studies and analyses for completeness and accuracy. Identify resulting impacts or adjustments that new study results may have on GSDO elements and projects as a whole.

D. Support and develop project-specific performance measures to include EVM System (EVMS) analysis (or other performance measurement if EVM is not required).

E. Support and develop project annual budget development, Construction of Facility (CoF) planning and management for GSDO ground systems.

F. Support V&V planning and management, and field implementation oversight and management.

G. Collect and analyze project performance data for reporting at various management review forums (e.g., IPT Monthly Review and Monthly Program Review).

   Note: Project performance data includes technical issues and accomplishments, schedule and cost variances, risk management, and quality associated with projects.

H. Assess project staffing, EIT/IPT implementation plans, and schedules to meet GSDO Program/element requirements and allocated milestones.

I. Manage performance of and deliver studies and assessments to support project planning and change requirements.

J. Review the technical, cost, and schedule aspects of programmatic trade studies and analyses for completeness and accuracy. Identify resulting impacts or adjustments that new study results may have on GSDO elements and projects as a whole.

K. Provide *Schedule Analysis and Metrics* in accordance with Appendix C. Provide *Project Metrics* in accordance with DRD PM-02.

L. Integrate the following sources of EIT/IPT level project performance data:

   1. Project budget details to provide an integrated project development budget.

   2. Project performance measures and EVMS (or other performance measurement if EVM is not required) data for an overall performance metric.

   3. Detailed project schedules as required and publish a monthly schedule book in accordance with Appendix C and DRD PM-02.

M. Assist in the development of and recommend guidance and policy for the management and integration of project development efforts; and participate in various management review forums.

N. Collect project status notes for each ground element and associated projects to include relevant technical, cost, and schedule issues or accomplishments.

O. Assist in writing project implementation requirements for development, construction or fabrication, and activation of ground systems projects.

P. Support the PPBE preparation which includes forecasting project budgets over a multi-year horizon, and developing phasing plans and operating plans.

Q. Track and provide schedule variances at the IPT level, measuring planned versus actual milestones and tracking critical paths. Integrate all schedules with the development project schedules.

   Note: Development project schedules are created by the ESC or successor contractor.

R. Provide support to GSDO Program integration activities that will affect ground systems concepts, trade studies, and other preliminary work (e.g., architectural, interfaces, ConOps). Support the definition/management of the ground elements architecture systems definition and support cross-element technical integration as it relates to requirements management, schedule management, design/development, verification, validation, and system/element acceptance and turnover.

S. Support updating the ground elements requirements to include flow down and linkage to architecture and operational concepts; analysis of functional allocations, element configuration concepts, inter-element interfaces, and external interfaces.

T. Support the implementation of commercial user requirements where applicable to ensure correct project design and operability.

U. Support and develop software architectural requirements, software requirements management, software integration, software and control systems V&V, software interfaces specification and management, software and application requirements, and command and control roadmap to support block upgrade strategies.

V. Support the collection of design and construction content for reviews such as PDR, CDR, DCR, SAR, and ORR.