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J-1
Performance Work Statement

For

**Kennedy Space Center Integrated
Communications Services (KICS)**

1.0 CONTRACT OVERVIEW

Kennedy Space Center (KSC) Communications Vision:

The Kennedy Space Center desires to acquire world-class support for existing systems and services, modernize its communications infrastructure, increase communication services customer satisfaction, develop a service-based communication support model, and use this model to meet future communications needs.

The desired end state, after modernization, is analogous to service levels and standards of the telecommunications industry (i.e. shared, high capacity infrastructure, 99.999% availability, coherent access to large quantities of dissimilar information including: voice, video, telemetry, audio, and data). KSC seeks establishment of relationships and/or affiliations with the communications industry and related technology providers. The primary role of these relationship(s) will be to infuse knowledge, advanced technologies, and operational methodologies into KSC's communications systems in order to achieve KSC's modernization goals of increasing services, reducing cost and meeting PWS requirements. Candidate areas for application of this expertise/knowledge include: WAN/MAN design; development and implementation; emerging communications technology implementation; and large scale deployments (premise wiring, infrastructure upgrades, LAN/MAN/WAN). "Affiliate," as used in this PWS, means a party obtained via subcontract or other legally binding agreement that will support design, implementation, and operations activities associated with this KSC Vision.

A wide range of customers will be serviced under this contract, including multiple NASA programs, DOD, contractors, academia, other government agencies and varied space related industry entities. The contract scope includes a wide spectrum of services and capabilities that are categorized as "communications" and vary from well-defined delivery order type items to efforts that involve the discovery and development of the future.

The contractor shall perform contract Phase-In and operational support activities so as to assure a seamless transition to and implementation of the new contract without any impact to existing communications infrastructure or mission operations.

The contractor shall perform communications and IT system design, development, operations, planning, maintenance, modernization, engineering, and life cycle management for the Kennedy Space Center and NASA Initiatives. The goals associated with this effort include increased responsiveness to customer needs, increased levels of customer service and satisfaction, and operational support for multiple concurrent users.

The contractor shall implement, maintain and utilize IT security hardware and software techniques, upgrades, plans and tools to ensure the highest integrity and security of KSC IT communication systems and services.

The contractor shall perform its responsibilities in the most cost-effective and efficient manner while supporting the government's top priorities for safety, security, mission success, customer satisfaction and infrastructure stewardship. These responsibilities include the following: program management; design, engineering, operation and maintenance of assigned facilities, ground systems; information technology; logistics; and institutional support.

The contractor shall perform all necessary program management including technical and business functions to plan, implement, track, report, and deliver the required products and services described in this Performance Work Statement (PWS). The contractor shall provide all personnel and other resources, except as otherwise specified in the contract, necessary to accomplish these functions. The contractor shall execute these management functions while maintaining flexibility and responsiveness to changing requirements.

The contractor shall implement a comprehensive safety and mission assurance program that emphasizes safety, health, and environmental stewardship in accordance with the NASA Safety Hierarchy described below in Section 3.0.

Under this contract, the contractor shall have broad mission and day-to-day responsibilities of increasing customer satisfaction, performing communications system and IT development, providing operations and modernization for the government and designees. Therefore, the general scope of the contract covers any communications or IT services or related activities arising from the PWS in support of human exploration and development of space, earth and space science exploration, or related enabling functions.

This contract will require the contractor to maintain and operate KSC's communications infrastructure to support KSC communications needs while migrating towards a service based model over the life of the contract. Implementation of this vision will require the contractor to collapse existing systems and their supporting infrastructure into a common communications infrastructure without negatively impacting operational support levels. As this process progresses, the capabilities provided by these systems will move away from a "Cost Plus" model and toward a priced-service model. Key outcomes desired from this migration include improved flexibility of communications systems and infrastructure and improved responsiveness.

2.0 BUSINESS MANAGEMENT

The contractor shall perform all business functions necessary to execute and administer the Kennedy Integrated Communication Services (KICS) contract under the guidelines of the center's safety, health, and environmental policies.

The contractor shall manage and control intra-company, subcontractor, and vendor activities required to fulfill the contract. The contractor shall be accountable for the quality and timeliness of the goods, services, and Indefinite Delivery/Indefinite Quantity (ID/IQ) efforts under this contract. The contractor shall provide visibility for the government into all aspects of intra-company, subcontractors, and vendor activities.

The contractor shall provide the government with a quarterly KICS contract review, which includes, but is not limited to: financial status, indirect rate reviews and contract cost forecast (with estimate to complete), cost savings and cost avoidance initiatives, systems status, on-going projects, completed projects, planned or proposed projects, risk management status and risk mitigation planning/status, and safety and health data.

The contractor shall provide monthly status reviews and develop, maintain and report performance-based metrics associated with cost, schedule, and quality performance. The contractor shall define and implement project controls for managing changes to the overall contract cost and schedule.

The contractor shall perform to the communication service standards as shown in the Surveillance Plan, Attachment J-5, Table 1, and deliver communication services in accordance with Attachment J-5, Table 2.

The contractor shall implement KICS requirements and further KSC's goals in reaching the KSC business management objectives of:

- Providing safety, health, and environmental stewardship
- Providing quality communication systems with no impacts to operational activities
- Providing flexible communication resources to meet customer requirements
- Providing personnel and processes that are timely and responsive to customer needs
- Providing expertise in communication systems
- Modernizing KSC communication systems infrastructure
- Delivering communication services within contract value
- Providing state of the art technology in communication systems
- Beginning and finishing projects on schedule and within budget
- Providing communications infrastructure stewardship
- Managing costs, including labor rates and indirect cost growth

2.1 Phase-In Plan

The contractor shall develop and implement a Phase-In Plan, which defines the contractor's approach to and estimated costs of phasing communication services from the incumbent contractor while minimizing operational impacts to various center customers. The Phase-In shall be complete within 90 days of contract award to include migration of all existing work control communication services data and records to the new KICS work control system. The work control system shall be fully operational by completion of the Phase-In period. The Phase-In Plan will address partnering with the incumbents and provide a time estimate for implementation. The contractor shall provide a Phase-In status to the government at a minimum of once per week.

2.2 Financial Management

The contractor shall develop, implement, and maintain an integrated financial management system for planning, tracking, compiling, and reporting contract costs. The contractor shall provide all other necessary financial support required by the government to meet the budgeting, cost reporting, billing, and disclosure requirements of the contract. The contractor shall develop and submit reports to the government per the Work Breakdown Structure (WBS) provided in Appendix 6. The contractor shall provide financial systems that support NASA's transition to full cost accounting.

The contractor shall provide financial reports in accordance with the requirements of the Financial Report (DRD M-1), and NF533. The contractor shall complete selected portions of NPD 9501.3A, Earned Value Management as directed by the Information Technology and Communications (IT&C) representative.

The contractor shall develop and implement a rolling five-year Technical and Cost Plan (DRD M-2) to define planned work and estimate the cost of work to be performed or planned during the subsequent five years. This plan shall be revised and updated every year. The contractor shall support the government's development of yearly operating plans with respect to cost and workforce assessment of KICS related responsibilities. The contractor shall support cost impact assessment of requirements changes, hardware modifications or upgrades, special studies, and Indefinite Delivery/Indefinite Quantity (ID/IQ) support. Requests involving ID/IQ cost estimates shall be addressed and provided to the government within 14 calendar days.

The contractor shall conduct a Monthly Financial Review meeting within 14 calendar days after the close of the reporting month to provide the government Contracting Officer's Technical Representative (COTR) insight into contract cost and workforce utilization. The contractor shall provide accurate expenditures and forecasts of labor and material costs and workforce utilization. The contractor shall develop and propose cost and workforce utilization metrics, including trend analysis, to the government for revision and agreement. The proposed metrics will reflect sustaining engineering, operations and maintenance activities, and ID/IQ support.

2.3 Technical Management

The contractor shall implement the contract requirements in a manner that ensures all activities required by this PWS are properly accomplished and recorded. The contractor shall implement a sustaining engineering and maintenance program. The contractor shall manage contract resources to account for surge, non-standard, and recovery requirements in addition to collecting, tracking and enforcing warranties provided for services, maintenance, or equipment related to communication services covered in the contract. The contractor shall recommend, develop, and implement innovative approaches consistent with government regulations that improve services and customer satisfaction provided under this contract.

After contract award, the contractor shall recommend, procure, incorporate, and operate commercially available systems as replacements for all obsolete Government Furnished Property (GFP) as delineated in Appendix 5. The contractor shall develop and identify components and systems requiring replacement or upgrade. The contractor's assessment of GFP to be replaced, or subsequently identified as obsolete, requiring upgrades, will be part of the Technical and Cost Plan. The government will approve any upgrade or replacement of GFP.

The contractor shall provide the government unrestricted on-line access to all data generated in the performance of this contract and utilize web-based interfaces whenever possible. Contract deliverables shall be made available to the government using automated, on-line systems, and may utilize existing KSC systems (e.g. TechDoc).

The contractor shall participate in weekly status (configuration and availability) meetings with associated communications systems government organizations.

2.3.1 Work Control

The contractor shall implement a work control process. This process must plan, schedule, execute, monitor, document and improve KICS-provided communication services. This process shall include In-Family and Out-of-Family (see Section 4.0) services and developmental activities, and shall exhibit sufficient flexibility to adapt to future contract requirements. The contractor shall utilize MAXIMO® as the KICS work control system. The government shall provide the software license to implement MAXIMO® for the current communications support services operating environment.

The contractor's work control system and business processes shall track and predict personnel and system resource usage and shall incorporate and utilize a resource leveling function across operations and maintenance, sustaining engineering, program support and ID/IQ. The contractor's work control system shall have the capability to provide online reports to identified government and customer users. The contractor's work control system shall provide and the contractor shall implement work control data migration to the KICS successor contractor.

The contractor shall provide an integration function for all communication services under contract. The integration function shall provide status to the government on all scheduled work, outages, and other items pertinent to the contractor's provision of communication services.

The contractor shall ensure critical communication services (e.g. security, fire alarms, OIS-D, paging and area warning, OTV, and other critical systems identified in Attachment J-1, Section 4.0) are available and operational 24 hours per day, 7 days per week. The contractor shall staff an existing communications control center 24 hours per day, 7 days a week to document customer requests for service. The communications control center shall initiate remediation activities by the appropriate KICS contractor organization or transfer the request to the appropriate KSC contractor for remediation.

For administrative communication services (e.g. phones, voice mail, video conferencing), the contractor shall respond to customer requests for service and correct service deficiencies from 6:00 a.m. Eastern to 8:00 p.m. Eastern, Monday through Friday except when specifically approved by the government.

The contractor shall support pre-planned program customer requirements and operational processing up to 24 hours per day, 7 days a week. In response to unplanned outages, schedule disruptions or to declared contingencies, the contractor shall support up to 24 hours per day, 7 days a week. The contractor shall perform outages and execute maintenance actions during non-mission critical and off-shift timeframes in order to minimize risk to program operations and to limit impacts to center wide processes (reference Section 2.3.5, Outage Management).

The contractor shall provide a weekly work schedule, with associated resource usage, for each system. The work schedules shall contain all work with the exception of In-Family and Task Order work items. The work schedules shall show all planned work for the current fiscal year as well as the previous week. All completed work shown on the schedules shall be indicated as such. The contractor shall also integrate all KICS system work schedules and provide, on a weekly basis (or less frequently, as determined by the IT&C government representative), an integrated master KICS work schedule.

The contractor shall provide a technical status report to the government on a weekly basis. The report shall address, but is not limited to, project status, significant maintenance actions, system anomalies, customer support issues, near-term outages, issues and concerns, and planning status of future work. The contractor shall provide minutes and track and maintain an action item log through completion of corrective action.

The contractor shall schedule activities to include the following minimum information:

1. Work orders to be executed
2. Task duration, including start and end times

3. Identification of hazardous operations and associated control area requirements
4. Task leader and phone number
5. Personnel resources, by function, required for each activity
6. Parts required to implement the task
7. Related system outages and impact times

The contractor shall provide schedule activities information to the government during the weekly status meetings. Scheduling information shall also be incorporated into the weekly work schedule described above.

2.3.2 Requirements

The contractor shall develop and maintain a process for collecting and documenting customer requirements. The contractor shall be responsible for the entirety of communication systems from data source to delivery at the customer interface point. The contractor shall assist KICS customers in development of communication system requirements and documentation of requirements in official databases.

The contractor shall respond to requirements in the Program Requirements Document (PRD) using the Automated Support Requirements System (ASRS) in accordance with KSC GP60-3, Automated Support Requirements System Handbook. The contractor shall provide a closed-loop, tracking mechanism to ensure requirements are documented in work control procedures, implemented, and verified within the database.

The contractor shall develop and implement a web-based tool for KICS customers to document and track communication support requirements and obtain work schedules to be operational 6 months after contract award.

For program mission support or major institutional customer requirements that cannot or will not be met, the contractor shall prepare, process, and provide justification for approval by the IT&C government representative.

On an as-requested basis, the contractor shall provide the government with status of completed and open requirements to include estimated hours and/or cost to complete.

2.3.3 Reviews

The contractor shall provide support and technical input with respect to communication systems at various reviews. These reviews include, but are not limited to, those listed in Table 2.1.

FUNCTION	REVIEW
STS	Flight Hardware Move/Mate Readiness Review
	S0017, Terminal Count Demonstration Test (TCDT) Pre-Test Briefing
	S0026, S0028 Orbiter Landing

	S5023, Orbiter Rollover
	A5214, SSV Rollout
	S0009, Pad Validation
	S0014, Flight Readiness Firing
	S0037, LH2/L02 Load Demonstration
	Payload Interface Test (S07XXX) as applicable
	Launch Readiness Review (LRR)
	S0007, Launch Countdown Pre-Test Briefing
	S0007, Launch Countdown Post-Test Briefing
	S0007 and S0017 OMI Reviews
	GSS Rollover, Rollout Readiness Review
ISS/Payloads	Payload Test as applicable
	Payload Test OMI Review as applicable
	Launch Site Support Plans
	Program Requirement Documentation Review
	Payload Readiness Review (PRR)
	Ground Operations Readiness Review (GORR)
LSPO	Launch Management Coordination Meeting (LMCM)
	Launch Readiness Review (LRR)
	Flight Readiness Review (FRR)
Institutional	Major Moves
	Emergency Preparedness Plan Annual Review
	Center Director Annual Holiday Outage Review
	Facility construction and modification as applicable
	Institutional reviews and boards as applicable
	CoF Design Reviews
	Monthly Financial Review
	KICS Quarterly Contract Review
All	Anomaly/investigation reviews as applicable
	Constraint and Pre-Test reviews as applicable
	IT&C Pretest and Posttest Readiness Reviews

Table 2.1: Reviews

2.3.4 Meetings

The contractor shall provide support and technical input with respect to communication systems at various program and institutional meetings at KSC. These meetings include, but are not limited to, those listed in Table 2.2. The contractor shall respond to action items identified at meetings.

FUNCTION	MEETING
STS	Launch Countdown Working Group (LCWG)
	Launch Commit Criteria Working Group

ISS/Payloads	Ground Operations Working Group (GOWG)
	Technical Interchange Meeting (TIM)
	ICS Status Meeting
	Monthly Facility IPT
LSPO	Ground Operations Working Group (GOWG)
	Technical Interchange Meeting (TIM)
	Communication and Telemetry Requirements Meeting
Institutional	Outage Planning Meetings
	Major Moves
	Weekly Systems Status Meeting
	IT&C Prelaunch & Postlaunch Photo Review

Table 2.2: Meetings

2.3.5 Outage Management

The contractor shall plan and implement communication system and facility outages at KICS supported facilities. To ensure outages have been properly coordinated and approved by KSC customers prior to implementation, the contractor shall develop an outage identification, review and customer approval process, and participate in other contractor’s outage planning sessions and reviews. The contractor shall ensure outages are scheduled, initiated and recovered during periods of non-critical program or center processing and shall ensure communication systems maintenance, update, test, checkout and repair are completed as defined by requirements in the PRD and Section 4.0. The contractor shall recover from unplanned outages in a manner that limits impacts to critical center or mission processing operations. For each outage, the contractor shall maintain a list of impacted systems and approving organizations. The KICS outage task leader shall ensure all affected parties are notified when planned outages exceed planned timelines or when unplanned outages occur.

2.3.6 Training

The contractor shall provide a reliable work force that is trained and competent, certified and licensed as required, and experienced and knowledgeable about the work to be accomplished, so as to meet all responsibilities under the contract throughout the life of the contract. The contractor shall manage training and certification to be cost-effective, and to ensure that the appropriate skills, experience, and knowledge are available when and where they are needed. The contractor will further manage training and certification to ensure that current skills and knowledge are maintained as technology advances and infrastructure modernization progresses. The contractor shall plan and implement training and certification as described here and in Section 8.0 of this Performance Work Statement.

The contractor shall maintain a technical reference library to support contractor personnel and for customer education and use. The contents of the library shall be cataloged to facilitate library use. The library shall contain documents not released through the

Engineering Data Center (EDC) process, or made available via the CMDS or Tech Doc systems, such as Commercial Off-The-Shelf (COTS) equipment and software manuals, vendor drawings, KICS-developed documents, and other documentation and publications and software that apply to the products and services utilized or delivered by the KICS contract.

2.3.7 Configuration Management

The contractor shall perform configuration management on all assigned hardware and software. The contractor shall provide configuration documentation for all communication systems and components operated under this contract such as, but not limited to: engineering drawings, circuit path routing, and access control, (DRD M-3). The contractor shall maintain the documentation of assigned systems to the “as-built” configuration. The contractor shall maintain the existing Operations, Maintenance and Engineering Matrix (OMEM), which delineates equipment configuration designation. The contractor shall appoint an administrator responsible for maintenance and updates to the Configuration Management Data System (CMDS). The appointed individual for CMDS will need to be trained and certified to perform the administrator’s functions. The contractor shall make configuration management data and information available to the government as requested.

The contractor shall provide a configuration control board and implement a configuration control process to receive, evaluate, prioritize, track and implement configuration control for communications systems.

2.3.8 Security Management

The contractor shall operate a security program in accordance with governing Agency, Department of Defense (DOD), Department of Homeland Security, and KSC directives as revised. The contractor shall develop, update and implement a Security Plan (DRD-M-4), which provides security planning for all personnel, facilities, equipment, and communications systems to assure compliance with, but not limited to, the following: NFS 1852.204-76, Security Requirements for Unclassified Technology Information Resources, FAR 52.204-2, Security Requirements, NFS 1852.223-75, Major Breach of Safety or Security, NPG 1620.1, Security Procedures and Guidelines; KHB 1610.1, KSC Security Handbook; NPG 2810.1, Security of Information Technology, and KSC Chief Information Officer (CIO) policies. The contractor shall submit IT Security Plans for review and approval by KSC’s IT Security Manager. The contractor shall implement IT specific security in accordance with the requirements of the PWS, Sections 4.0 and 6.0.

The contractor shall ensure personnel have the required Personnel Reliability Program (PRP) and security clearances for access to controlled facilities and systems at Kennedy Space Center.

2.3.9 Emergency Management

The contractor shall develop, update and implement an Emergency Preparedness Plan (DRD M-5) in compliance with JHB 2000, Consolidated Comprehensive Emergency Management Plan and JDP-KSC-P-3014, Generic Emergency Procedures Document. The plan shall include the contractor's assigned communication systems, hardware, software, infrastructure, equipment, data storage and operations. The contractor shall plan for and participate in drills and implement the Emergency Preparedness Plan for declared institutional and customer emergencies.

The contractor shall ensure that the Emergency Preparedness Plan includes plans to respond to significant loss of capability due to accident or incident, equipment or infrastructure failures, attacks against computer systems and networks, loss of capability due to natural disaster, and other center-level emergency situations, and include plans to conduct timely recovery.

Under Center-declared or program-declared emergency conditions, the contractor shall respond and implement real-time identified requirements at the direction of the CO, COTR or IT&C government representative.

The contractor shall designate a KICS Emergency Coordinator responsible for supporting emergency preparedness planning and implementation.

2.3.10 Data Management

The contractor shall develop, update and implement a data management program, which provides for the management, preparation, publication, control, and distribution of data generated during the performance of this contract in compliance with NPD 1440.6, NASA Records Management. The contractor shall develop and maintain data repositories to support contract requirements including Data Requirements Document (DRD)/Data Requirements List (DRL) related products. The contractor shall provide for the handling and control of customer and proprietary data and software. The contractor shall provide a Data Accession List of documents produced and maintained for this contract.

The contractor shall identify an export control focal point to represent the contractor at the KSC Export Control Working Group (ECWG).

The contractor shall maintain the documentation baseline and ensure all new data storage (hardcopy and electronic) and KICS work control information. The contractor shall maintain compatibility with work control management systems of Shuttle, ISS, Institutional, and Launch Services Program Office contractors. The contractor shall maintain and integrate all legacy and historical system documentation data into any new documentation and workflow process.

The contractor shall maintain existing documentation and all documentation developed as part of the contract. The contractor shall provide the library functions to catalog, store

(electronic format), and maintain data. Existing hardcopy documentation, which cannot be converted to electronic format, may remain in hardcopy only with the approval of the Information Technology and Communications directorate. The contractor shall make the data available to the government as requested.

The contractor shall maintain and operate a repository for engineering documentation that includes a formal release process. The contractor shall update and revise documents, and purge outdated documents, as required. The contractor's repository and release system shall utilize existing EDC and CMDS engineering documentation systems and shall include basic engineering drawings and all released revisions, for contractor drawings, vendor drawings, shop drawings and work orders.

The contractor shall create and provide to the government unrestricted, on-line access to data stored and produced under this contract. All data made available to the government under this contract shall be retrievable, editable, and compatible with government hardware and software systems as identified in the requirements listed in Section 6.0, Contract Level Information Technology. This on-line access capability shall first be made available at the completion of the phase-in period and then maintained throughout the duration of the contract.

The contractor shall create, submit for government approval and implement the communication systems Data Impoundment Plan (DRD M-6) by the completion of the phase-in period. The plan shall address data associated with communication systems that control data access, capture communication system configuration, and restrict data release to specified organizations.

2.4 Quality Management

The contractor shall ensure the communication systems processes and procedures provide quality services and products to the government, continuously improve these products and services, ensure the safety of its personnel and assets, provide a healthy work environment for its personnel, provide environmental stewardship with respect to the KSC communication systems and other assigned sites under this contract, and ensure customer satisfaction.

The contractor shall develop, maintain, and implement a Quality Management Plan (DRD M-7).

2.4.1 Customer Satisfaction

The contractor shall provide the communication services defined and described in this PWS so as to ensure the satisfaction of Space Shuttle, International Space Station (ISS), Launch Services Program Office (LSPO), Institutional, and future KSC customers while

utilizing continuous improvement methods (Section 2.4.4) to succeed in the dynamic KSC work environment.

The contractor shall provide customer management support to the government for all program customers to include: Shuttle, ISS, LSPO, Institutional customers, and potential future KSC projects and programs. The support includes, but is not limited to: participating in internal KSC planning meetings, assisting Center customers in defining site and program processing requirements, and documenting site requirements.

2.4.2 Quality Assurance

The contractor shall establish, certify and maintain a Quality Management System (QMS) that, as a minimum, certifies and adheres to the requirements of ANSI/ISOASQ 9001-2000 American National Standard Quality Management Systems – Requirements, and revisions, throughout the contract duration. The contractor’s initial QMS shall become registered by a Registration Accreditation Board (RAB)-certified third party registration body within 12 months of the effective date of the contract. The contractor’s full, certified version of the QMS shall be registered within 18 months after contract award by a Registration Accreditation Board (RAB)-certified third party registration body. The registration scope shall be the contractor’s quality system scope as defined in the contractor’s quality manual. The QMS procedures, planning, and all other documentation and data that comprise the QMS shall be made available to NASA for review on an as-requested basis. Existing quality documents that meet the requirements of this contract may continue to be used. NASA may perform any necessary inspections, verifications, and evaluations, to ascertain compliance to requirements and the adequacy of the implementing procedures. In addition, the contractor’s QMS shall make provisions for the following supplements to the 9001-2000 elements:

1. Customer Verification of Subcontracted Product - The contractor shall submit procurement documents to the designated NASA representative for determination of the need for Government Source Inspection (GSI) prior to release of the procurement.
2. Procurements, which require GSI, shall include the following statement, “The Government has the right to inspect any or all of the work included in this order at the supplier’s plant.”

The contractor shall collect and compile evidence derived from empirical data including, but not limited to: test results, analysis reports, inspection records, and delivery logs to establish that the products and services delivered to the government are in compliance with the requirements and specifications of the KICS contract.

The contractor shall develop, implement and update a process to control and improve the quality of products and services provided under this contract. The contractor shall develop a set of parameters with government concurrence, to be monitored by contractor quality personnel for the measurement and verification of critical processes that control key product characteristics. The measurements shall include, but not be limited to, data

on product and service quality, workmanship errors and rework. The process shall be auditable by the government and documented by the contractor.

The contractor shall participate in the Government/Industry Data Exchange Program (GIDEP) and NASA advisory reporting systems in accordance with NPG 8735.1, Procedure for Exchanging Parts, Materials, and Safety Problem Data Utilizing the Government-Industry Data Exchange Program and NASA Advisories.

The contractor shall notify the government of mission critical hardware/software anomalies and make available all trouble tickets on said hardware/software. The contractor shall provide the government status on such problem reports and notification of anomaly correction in a timely manner.

In the event of a program or center incident or contingency, the contractor shall support any government investigation and make available all pertinent documentation.

2.4.3 Reliability and Maintainability

Within one year of contract start, the contractor shall develop and implement a reliability and maintainability program that meets the requirements of NPD 8720.1, NASA Reliability and Maintainability Program Policy, and NASA-STD-8729.1, Planning, Developing, and Managing an Effective Reliability and Maintainability (R&M) Program. The contractor shall develop and implement a process that ensures the reliability and maintainability throughout the lifecycle of the communication systems and equipment for which the contractor is responsible. The process shall include assessments of reliability and maintainability performance against baseline allocations; preparation of reliability and safety analysis assessments and trend analyses; and participation in failure reviews.

2.4.4 Continuous Improvement

The contractor shall develop, update, and implement a continuous improvement program in accordance with ANSI/ISOASQ 9001-2000 American National Standard Quality Management Systems – Requirements.

The contractor shall initiate action, including requesting government approval, to change requirements that are indicated, by trending and data analysis, to be unreasonable or unnecessary, and to improve processes that result in products or services that fail to meet requirements.

2.4.5 Work Documentation and Authorization

By completion of the phase-in period, the contractor shall develop and implement a work order process that documents, controls, authorizes, schedules, executes, and reviews all work performed on communication system hardware, software, and facilities. The contractor's process shall perform configuration control of work orders, to include work order publication, revision, and release. The contractor shall ensure work orders provide

detailed instructions for all activities, identify hazardous activities and associated control areas, track as-built configuration, and verify approved requirements are satisfied.

2.4.6 Foreign Object Debris (FOD) Prevention

The contractor shall ensure its personnel adhere to the KSC FOD prevention program in accordance with KHB 5310.1D, Reliability, Maintainability and Quality Assurance Handbook, General Operating Policy 5-4.

2.4.7 Energy Conservation

The contractor shall develop and implement an energy conservation program. The contractor shall, on an as-requested basis, report to the government on measures taken to reduce energy consumption and provide quantified or estimated cost savings data. Energy conservation shall not be applied at the expense of quality and customer support. All new equipment, where applicable, shall have a high-energy efficiency rating.

2.4.8 Performance Metrics

The KICS contractor will develop, maintain, analyze and report performance for contract requirements and provide quarterly management reviews. The KICS contractor shall provide clear quantifiable metrics, which incorporate any contractually defined metrics in partnership with the IT&C Directorate. The contractor shall prepare a written document defining the agreed upon performance metrics which shall be approved by the Contracting Officer prior to implementation. The contractor will report existing or potential problem areas and identify corresponding trends. The report will also provide recommended solutions with estimated costs and completion times. The contractor shall submit a consolidated quarterly electronic Contract Performance Metrics Report to the Contracting Officer. The contractor shall also provide supporting data to substantiate compliance with the identified metrics. The contractor shall provide on-line access to the Contract Performance Metrics Report and supporting data to NASA-KSC personnel and other government personnel approved by the Contracting Officer. The Contract Performance Metrics Report will be developed in accordance with DRD M-8.

2.5 Risk Management

The Contractor shall develop and implement management approaches, including the criteria, methods, and procedures for identifying, analyzing, planning, tracking, controlling, communicating, and documenting KICS-related risks associated with:

- Contract Transition/Phase-In
- Contract Administration
- Performance of PWS Requirements

- Contract Financial Management

The contractor shall develop, implement, and update a Risk Management Plan (DRD M-9) in accordance with NPG 7120.5, NASA Program and Project Management Processes and Requirements (Section 4.3, Risk Management) and NPG 8000.4, Risk Management Procedures and Guidelines. The Risk Management Plan shall provide an organized, systematic decision making process that efficiently manages risks associated with the KICS at KSC.

The contractor shall identify and discuss risk factors and issues, for the areas delineated above, which are relevant with the performance of assigned duties during various management meetings and contract reviews. The discussion shall include methods to mitigate/manage identified risks, including presentation of risk mitigation status at periodic meetings and reviews.

3.0 SAFETY, HEALTH, AND ENVIRONMENTAL STEWARDSHIP

NASA has established its safety priorities as follows:

- (1) **Safety for the Public**
- (2) **Safety for Astronauts and Pilots**
- (3) **Safety for the NASA and Contractor Workforce**
- (4) **Safety for High-Value Equipment and Property**

The contractor shall assist KSC in reaching its safety goals by ensuring freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

3.1 Safety and Occupational Health

The contractor shall develop, implement, and maintain a comprehensive safety and occupational health program, which ensures the protection of personnel, property, equipment, and the environment. The contractor shall submit a Safety and Occupational Health Plan (DRD SHE-1), which describes its approach to maintaining the health and welfare of its employees and assets.

The contractor shall comply with KHB 1710.2, KSC Safety Handbook and all applicable federal, state, and local government safety laws, regulations, and policies.

The contractor shall comply with all safety and mission assurance ground operations requirements of the STS, ISS, and LSPO programs.

The contractor shall comply with the maximum work time rules in accordance with Section 3.4 of KHB 1710.2, KSC Safety Practices Handbook. The contractor shall maintain a list of critical positions and make this list available to the government as requested.

The contractor shall take, or cause to be taken, any other safety, and occupational health measures the government may reasonably direct.

The contractor shall investigate all work-related incidents, accidents, and close calls, to the extent necessary to determine their causes and furnish the government a report in a timely fashion, in such form as the government may require, of the investigative findings and proposed or completed corrective actions.

The contractor shall implement any corrective actions directed by the government.

The contractor shall assist authorized government representatives in examination of sites or areas where work under this contract is being performed in order to determine the adequacy of the contractor's safety and occupational health measures.

The contractor shall obtain safety approval on all hazardous procedures prior to execution.

The contractor shall institute a risk management process for assuring personnel and property will be protected from injury or harm as a result of exposure to hazards in accordance with Agency and KSC guidelines, policies and directives reflected in this section. The risk management process shall be implemented at contract start and shall provide prompt and thorough investigation and reporting of accidents or "near misses" and shall incorporate methods for review, deviations and approvals of operating procedures.

The contractor shall support, participate and incorporate KSC Super Safety and Health Day into workforce education, operational planning, system availability while ensuring contract requirements are met.

3.1.1 Voluntary Protection Program

The contractor shall have a robust safety and health program that could be certified to the most recent OSHA Voluntary Protection Program (VPP) Star certification requirements within 24 months after contract start. The contractor shall demonstrate to the government compliance with OSHA Star certification requirements in the same format required for the OSHA Star certification application within 18 months after contract start. The contractor shall document its progress toward and maintenance of compliance with VPP Star certification requirements in quarterly Safety Statistics Report (DRD SHE-2). If the contractor obtains OSHA VPP Star certification, the contractor shall provide the government with a copy of all reports submitted to OSHA for the purpose of maintaining Star certification.

3.1.2 Systems Safety

The contractor shall develop and implement a process at contract start, as documented for the identification, mitigation and control of hazards throughout the complete life cycle (design, development, manufacture, test, operations, maintenance, and disposal) of the facilities, equipment and processes for which the contractor is responsible. The process shall include quantitative or qualitative risk assessments, hazard analyses, and other analytical methods. The contractor shall select the type of assessment based on the identified level of risk. The contractor shall make all system safety assessments available for review.

3.1.3 Operations Safety

The contractor shall develop and implement a process in which testing, operations, and maintenance activities are assessed for hazards. The process shall identify how personnel and property will be protected from injury or harm as a result of exposure to these hazards. The process shall identify how personnel and property will be protected from injury or harm as a result of exposure to these hazards. The process shall provide for hazardous operation surveillance, hazardous procedure review, and risk assessments associated with deviations from procedures or safety and health requirements. The contractor shall document the assessments and make the assessments available for government review as requested.

3.1.4 Mishap Investigating and Reporting

The contractor shall investigate and report mishaps, in accordance with NPG 8621.1, NASA Procedures and Guidelines for Mishap Reporting, Investigating, and Record keeping, NPD 8621.1, NASA Mishap and Close-Call Reporting, Investigating, and Record Keeping, and KHB 1710.2, Kennedy Space Center Safety Practices Handbook. All mishaps and close calls shall be entered into the NASA Incident Reporting Information System (IRIS) database. The contractor shall conduct human factors analysis of all mishaps and close calls. This will include performing root cause analysis and implementing remedial/corrective actions for all mishaps and close calls. All root causes shall be identified and mitigated with the goal of recurrence prevention.

When arising out of work performed under this contract, the contractor shall immediately notify and promptly report to the government any accident, incident, or exposure resulting in fatality, lost-time occupational injury, occupational disease, contamination of property beyond any stated acceptable limits set forth in the contract schedule; any property loss of \$25,000 or more; or any close call (a situation or occurrence with no injury, no damage or only minor damage (less than \$1,000) but possesses the potential to cause any type mishap, or any injury, damage, or negative mission impact, that may be of immediate interest to NASA. The contractor shall provide quarterly reports specifying lost-time frequency rate, number of lost-time injuries, exposure, and accident/incident dollar losses as specified in the contract schedule for work conducted on premises owned or controlled by the government.

The contractor shall develop and implement a call tree with government contacts for the reporting of a mishap, a close call incident, an equipment problem or a system going out of specification. The contractor shall report incidents and problems within four hours of the occurrence.

The contractor shall provide summary data on mishaps, incidents or close calls (DRD SHE-3).

3.1.5 Lessons Learned

The contractor shall develop, update and implement a process to capture, disseminate, and implement safety and occupational health lessons learned in accordance with NPG 8621.1, NASA Procedures and Guidelines for Mishap Reporting, Investigating, and Recordkeeping, and NPG 7120.5, NASA Program and Project Management Processes and Requirements. The contractor shall enter the lessons learned into the government provided Lessons Learned Information System operated by the Goddard Space Flight Center (GSFC).

3.1.6 Industrial Hygiene

The contractor shall develop, update and implement an industrial hygiene process in accordance with the requirements of NPG 1820.1, Hearing Conservation, KHB 1840.1, Industrial Hygiene Handbook, KHB 1820.3, KSC Hearing Loss Prevention Program, and KHB 1820.4, KSC Respiratory Protection Program.

3.2 Environmental Stewardship

The contractor shall develop and implement an environmental protection program to ensure the welfare of the KSC environment and of other locations where work is performed in support of this contract in accordance with KMI 8800.8, KSC Environmental Management and KHB 8800.6, KSC Environmental Control Handbook. The contractor shall comply with all applicable federal, state, and local government environmental laws and regulations. The contractor shall prepare and submit, to the appropriate regulatory agency, any and all documentation required in support of this contract.

The contractor shall support KSC recycling and remediation initiatives.

The contractor shall apply for and maintain all necessary permits required by Federal, state or local rules and regulations. Permits shall be submitted through the NASA/KSC Environmental Program Office.

The contractor shall handle all waste streams generated by their processes in accordance with KHB 8800.7, Waste Management Handbook.

4.0 COMMUNICATIONS SYSTEM SERVICES

The contractor shall provide Communications System Services, which include, but are not limited to System Operations, Sustaining Engineering, Customer Requirements Tracking, Communications Control, Maintenance, and Analysis and Assessment. The communication services provided under this PWS support operational and institutional communications system customers at KSC and NASA occupied facilities that are provided in the bidders library.

The operational communication systems provide communication capabilities for ground processing, testing, launch, and landing (including contingency landing sites), and expendable launch vehicle activities. The institutional center-wide communications systems provide services for all KSC users, including KSC and NASA occupied facilities on CCAFS, CONUS and TAL.

The contractor shall provide communication system services up to customer end-equipment interfaces, Customer Owned and Maintained (COAM) interfaces, and external and other service provider demarcation points (Attachment J-2). The contractor shall maintain, operate, configure, de-configure, integrate, de-integrate, implement modifications to, refurbish communications, decommission, and dispose of obsolete system hardware and software listed in Attachment J-1 Appendix 5.

The contractor shall provide end-to-end traceability for all communication system requirements and related work. The contractor shall provide system status on communication system tasks including but not limited to trouble tickets, in-family work, out-of-family work, missions and upgrade project tasks. The contractor shall prepare, update, and provide performance-to-plan and open item status reports for pre-launch briefings and post-launch and landing reviews.

The contractor shall coordinate and obtain all necessary support from other contractors and government organizations providing services at KSC and NASA occupied facilities on CCAFS, CONUS and TAL. The contractor shall track all support requests, both internal and those forwarded to other contractors or government organizations, for all assigned communication systems related work.

4.1 Communications Systems and Services Activities

The contractor shall provide operations, maintenance, sustaining engineering, communications control, customer requirements support, engineering analysis and assessment, and documentation for all KICS systems.

The contractor shall provide readiness status of KICS systems to activity review boards that are responsible for mission readiness. KSC Ground Support Readiness Review

meetings are held approximately 10 days prior to launch countdown Call-to-Stations. The readiness status shall include, but not be limited to testing results and status of training, certification, hardware/software and procedures. The contractor shall report the operations readiness for KSC Ground Support communications systems to support launch and landing functions, including nominal and contingency/emergency. The KCS Communications Operational Readiness Review shall describe the operational readiness of all facilities, personnel, procedures, hardware, firmware, software and documentation required to support a specific launch. The KSC Communications Operational Readiness Review shall contain all information required to document the operational readiness of all facilities, hardware, firmware, software, personnel, and documentation to support KSC launch and landing services. KSC Communications Operational Readiness Review shall contain status of: Operator Training and Certification, System Validation Results, Discrepancy Reports, Open Work, Corrective Actions, IT Security, Physical Security, and Facility readiness.

4.1.1 Operations

The contractor shall ensure that all KICS communications systems are operationally ready for scheduled customer and contractor processing activities. The contractor shall provide end-to-end communications configuration, validation, and support. The contractor shall schedule communication services to accomplish KICS requirements and avoid impact to operations and administrative activities.

The contractor shall perform and implement out-of-family work for assigned systems. Out-of-family work includes changes that affect the system baseline design and/or system architecture and adds, moves and changes that require major configuration change or engineering. An architecture change is the addition of new capability, change in system topology, system modification, or system software change. Out-of-family work requires a NASA signature on the work plan, work order, the work order resubmission number, etc. The contractor shall accept NASA direction from an Integrated Data System (IDS) communications Technical Review Panel (TRP) consisting of department manager and a NASA branch chief (if required) and or their designees who review and disposition change request and assessments. The contractor shall activate and validate out-of-family modifications or new capabilities at the end of installation and prior to hardware and system operations. The contractor shall coordinate with the user organization during final activation and validation.

The contractor shall support in-family work that provides services based on the as-designed system or fits within established capacities. NASA signature is not required. The contractor shall coordinate with the user organization during final activation and validation.

The contractor shall complete communications systems installations in new facilities including make-it-work modifications during joint occupancy and assume maintenance

responsibility following acceptance of the facility. The contractor shall perform integrated testing, if required, after the installation of non-KICS equipment and systems.

The contractor shall coordinate and obtain authorization for all new contractor and new customer equipment radio frequency transmissions from the KSC Frequency Control Officer Spectrum Manager per the requirements of KHB 2570.1, KSC Radio Frequency Spectrum Management Handbook. The contractor shall ensure that all newly procured equipment is issued a Radio Frequency Authorization (RFA) by the KSC Frequency Control Officer Spectrum Manager. The contractor shall ensure that any contractor assigned equipment replacement item is within the spectrum bandwidth previously approved for contractor or customer use by the KSC Frequency Control Officer Spectrum Manager.

4.1.2 Maintenance

The contractor shall implement a maintenance program for all communication system hardware, software, and contractor managed support equipment. The level of maintenance provided shall ensure the reliability, cost effectiveness, serviceability, and longevity of the assigned systems. The contractor shall develop and maintain a Five Year Maintenance plan (DRD-T-2) to describe planned maintenance activities and resources required.

The contractor shall maintain the historical communication systems maintenance and repair data for trending purposes utilizing the work control process.

The contractor shall maintain warranty guarantee and maintenance contract records for assigned communication systems for any warranty, guarantee or maintenance contract period. The contractor shall investigate the failure of any covered hardware or software, and report findings to the government during the established reviews. The contractor shall notify the government of actions that void a warranty, guarantee, or maintenance contract during the established reviews.

4.1.3 Sustaining Engineering

The contractor shall provide overall communications systems engineering and integration services. The contractor shall also support and coordinate advanced technology development as per 4.1.3.3. The contractor shall perform sustaining engineering for all communications systems including software and firmware identified in attachment J-1 appendix 5 to meet the original design intent (i.e., form, fit and function). The contractor shall document their overall approach for these tasks in the Sustaining Engineering Plan (DRD-T-1). The contractor shall perform engineering and task level support to upgrade systems and equipment performance and to improve safety, reliability, maintainability, functionality, and cost effectiveness.

The contractor shall provide systems engineering, development integration, and advanced technology development support for all assigned communications systems to the demarcation point (Attachment J-2) with systems and equipment under the responsibility of other KSC contractors. The contractor shall ensure that no change on the contractor's side of the interface causes an overall system outage or degradation on the other side of the interface. The contractor maintained and updated technical data shall include those documents that identify each part and its configuration at any level of assembly required to support KSC activity.

4.1.3.1 Systems Engineering

The contractor shall provide end-to-end communications systems engineering and service integration. The contractor shall manage and document the configuration of the current architecture and planned architecture changes utilizing procedures and processes developed in the Sustaining Engineering Plan (DRD-T-1).

Typical systems engineering functions include:

- Safety and mission assurance activities
- Coordination of activities that pertain to KSC communication system interfaces with non-KICS systems
- End-to-end system requirement integration
- Requirements management, analysis and requirements/design trade studies
- Establishing systems engineering processes
- Operations and development systems standards support, coordination, and control
- Integrated architecture baseline configuration management and planning, including schedule and change control
- Design analyses, architecture trade-off, and Make or Buy assessments
- System-level functional designs development
- Engineering strategies development
- Service capacity, performance, and life cycle cost forecasting
- External interface negotiation and design
- Facilitate and coordinate the commercialization and consolidation of services across the contract, consistent with the strategic architecture
- Evaluating and testing commercial off-the-shelf (COTS) software and hardware products including development and engineering tools
- Operations concept development
- Proactive end-to-end risk analysis management and abatement
- Conduct design reviews and maintain records for communications system projects and out-of-family tasks.
- Support design reviews for existing and new facilities on KSC and NASA occupied areas as assigned.
- Preliminary and final engineering assessments

4.1.3.2 Development Integration

The contractor shall provide end-to-end technical integration for communication assets into the KICS architecture and services infrastructure. These assets may or may not have been developed by the KICS contractor.

Typical integration functions include:

- System-level integration
- System-level verification
- System-level acceptance testing
- End-to-end testing

4.1.3.3 Advanced Technology Development

The contractor shall support advanced research and technology development for potential application in future communications systems. .

Typical advanced technology development products include:

- Technology insertion recommendations
- Technology projects assessments
- Market research and trade studies
- Monitor industry forums, trade shows and standards development

4.1.4 KICS Communication Control

The contractor shall provide Communication Control functions in support of KICS communication systems and services. The contractor shall provide a single customer point of contact for all KICS communication systems and services. Communication control is the KSC interface to external communication providers. Communication control responsibilities include but are not limited to screening, logging, triage, assigning-routing, resolution, and customer feedback. The contractor shall provide Communications Control services 24 hours per day, 7 days per week.

The contractor shall serve as the focal point for communications scheduling, access to communications facilities and assets, outage coordination, customer trouble ticket processing and reporting, coordination with other KSC/CCAFS/ER helpdesks and consoles.

The contractor shall provide communication support services in support of all operational and institutional communications at KSC including the KSC LC39, Payloads Area and Industrial Area. Communication support services at KSC shall support CCAFS, CONUS, Transatlantic Abort Landing (TAL) sites and Eastern Range (ER) tests as required.

The contractor shall provide non-KICS KSC Help Desks with information that identifies supported systems and a point of contact including contact information for each system. The contractor shall provide support to the KSC IT providers in facilitating problem resolution.

Communications Control services shall meet or exceed performance standards as listed in Attachment J-5, Table J5-1.

4.1.5 Customer Requirements

The contractor shall provide communication system services up to customer end-equipment interfaces, Customer Owned and Maintained (COAM) interfaces, and external and other service provider demarcation points (Attachment J-2). The communication contractor customers include but are not limited to resident NASA and contractor users, other government agency users and transient users.

The contractor shall respond to Customer Service Requests (CSR), Program Requirements Documents (PRD), NISN Service Requests (NSR), Telephone Service Requests (TSR), and Automated Support Requirements System (ASRS) requirements and verify the accuracy of the requirements. Requirements accuracy includes: first need date, mission related requirements and technical content. The contractor shall coordinate requirements to ensure requested service delivery by User Need Date (UND) in advance of mission contingent arrival.

The contractor shall provide end-to-end tracking and status of all communication system requirements. The contractor shall provide feedback to customer on communication system requirements including but not limited to system status on trouble tickets, in-family work, out-of-family work, missions and upgrade project tasks. The contractor shall prepare, update, and provide performance-to-plan and open item status reports for pre-launch briefings and post-launch and landing reviews.

The contractor shall provide a uniform requirements acceptance process. The contractor shall ensure multiple customer requirements integration to deliver timely responses for all work-in-process.

The customer satisfaction metric in Attachment J-5, Table J5-1 covers time performance and customer satisfaction for these processes.

4.1.6 Analysis and Assessment

The contractor shall perform engineering analyses and assess communications system impacts to safety, reliability, operability, scheduling, documentation and logistics for new requirements and capabilities.

At a minimum, the contractor shall include the following in the analyses and assessments:

- Implementation strategy
- Proposed coordination with other contractors
- Effects of proposed design, implementation, and operations on other contractors systems and operations
- Cost estimate
- Installation and testing requirements
- Environmental analyses
- Documentation per existing federal and state regulations
- Any necessary trade studies

4.2 Communications Systems

The contractor shall be responsible for operating, maintaining, and sustaining an array of communications systems at KSC. These systems interface with various onsite and offsite contractors, government organizations, educational institutions, commercial businesses, vehicle, and payload customers. The contractor shall adhere to the “clear frame” practice during critical operations. The “clear frame” practice freezes configuration of all operational communications for periods of up to 72 hours for Shuttle operations and 24 hours for LSPO operations. The contractor shall propose methods over the life of the contract to minimize the impact of the “clear frame” practice. The following systems utilize a wide range of government and industry standards to deliver services to the KSC user community:

- Voice Communications
- Visual Imaging and Timing Communication services
- Transmission Systems
- Cable Systems
- Administrative Telephone System
- Institutional Computer Networks
- Network IT Security

The contractor shall provide competent staffing to comply with all of the requirements described in the “Support Requirement” section for each of the respective services areas delineated below.

The contractor shall integrate the systems listed above with other external systems based at or affiliated with KSC to meet the Center’s communication requirements. A listing of GFP for KSC Communications is located in Attachment J-1 Appendix 5.

All communications services listed above shall meet or exceed the performance standards listed in Attachment J-5, Table J5-1.

4.2.1 Voice Communications

The contractor shall provide voice communications services and support end-to-end configuration and validation to meet operational and institutional requirements at KSC and the NASA occupied facilities at the CCAFS, CONUS, and TAL.

The contractor shall also provide voice communications services to the KSC News Facility and various locations throughout KSC, including, but not limited to: Point-to-point telephones, commercial audio communications, conference and Mission Briefing Room audio, Shuttle forward link and NISN network tail circuits at KSC.

The contractor shall provide voice communications services for Shuttle launch and landing at contingency landing sites in the continental US sites and transatlantic sites. The contractor shall also provide voice communications services at the Shuttle Processing Area (SPA) at the Dryden Flight Research Facility.

The systems associated with these services include, but are not limited to the following:

4.2.1.1 Operational Intercommunication System (OIS-D)

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC) and Building K6-900 (LCC)

SUPPORT REQUIREMENT: 24 hours x 5 days/week on-site; Weekend call-in.
On-site 24 hours x 7 days/week during major tests, launch, and landings.

FUNCTIONAL DESCRIPTION:

The Digital Operational Intercommunications System (OIS-D) is a fully digital, multi-channel, voice conferencing communication system. It consists of two system centers, one in the LC39 area and one in the Industrial area, with a common channel interface to allow intercommunication. It supports all KSC test and launch operations facilities. The major hardware components are the Group Processor Assembly (GPA), Data Transmission Equipment (DTE), Central Summing Network (CSN), End Instrument (EI), Technical Control (TC), Record and Playback Subsystem (RPS) and Offnet Processor Subsystem (OPS).

Brief descriptions of all hardware components follow:

Group Processor Assembly (GPA) Rack - The GPA is the principle rack assembly, it provides the interface between the user End Instruments (EI) and the Central Summing Network (CSN). Each GPA can support up to 119 EIs, they are installed at each major operational KSC facility, and they provide the first level of audio summation.

Data Transmission Equipment (DTE) Rack - The DTE racks are used to support transmission on fiber between the GPA and CSN for distances over 50 feet. The equipment converts an electrical T3 to an optical signal and back to an electrical T3.

Central Summing Network (CSN) - The CSN performs the second level voice conferencing, summing all voice contributions from the GPAs. Each system center has its own CSN. The CSN creates a global sum of digital audio traffic by successively adding pairs of 512 channel DS3 inputs until a 512 channel global sum is produced.

End Instruments (EI) - The EI is an operator controlled, multichannel, microprocessor-based device that provides the interface to the GPA. They communicate with the GPA over 19-AWG twisted pair at 130 kbps bipolar bit stream. Descriptions of the six types of instruments are provided below.

- (1) 51D - The 51D EI is a multimonitor, 19-inch rack mounted, single user-8 channel /dual user-4 channel unit for controlled environment (indoor) use.
- (2) 52D - The 52D EI is a multimonitor, 19-inch rack mounted, single user-4 channel /dual user-2 channel unit for controlled environment (indoor) use.
- (3) 53D - The 53D EI is functionally equivalent to the 52D, however, it is contained in a sealed, able to be purged, deep-drawn aluminum housing for use in hazardous environments. The unit is designed to be wall mounted or mounted on a portable cart.
- (4) 55D - The 55D is a desktop unit with 4 channels and a speaker for controlled environment (indoor) use.
- (5) 57D - The 57D is a rack mounted speaker monitor that can be used with a 51D or 52D unit. The unit is muted when the EI user is transmitting.
- (6) 58D - The 58D is a wall mounted speaker monitor that can be used with a 53D unit, but not in outdoor locations or hazardous environments.
- (7) 59D - The 59D is a desk-mounted speaker monitor for use in office areas.

Technical Control Workstations (Tech Control) - Tech Control provides overall monitoring and control capability for the OIS-D system operators. The Intel-based workstations are running UNIX System V with X Windows as the windowing environment. The machines are linked together over an Ethernet to the CSNs and OPS.

Record and Playback Subsystem (RPS) - RPS provides continuous recording of all channels in OIS-D by combining inputs from both the LC39 and Industrial Area CSN. Three digital recording units with two digital recorders in each unit will allow for recording of 1000 channels with 100% redundancy. Analog tape dubbing is provided through a separate playback recorder and analog cassette decks.

Offnet Processor Subsystem (OPS) - OPS is a redundant T1/T3 conferencing voice switch that provides both T1 interfaces out of OIS-D and individual audio channel interfaces through channel banks. This provides for off-center communications through both NISN and Transmission Management System (TMS). The interface is also used to bring radio-nets into OIS-D. OPS has a T3 interface with the two system center CSNs and has an input and output capability of 92 T1 links. Currently 26 channels banks and 38 T1s are being used to provide the off-site and audio interfaces.

OIS-D consists of approximately 3500 EIs, 57 GPAs, 49 DTE racks, 19 racks of CSN, 10 racks of OPS, 8 racks of RPS, 14 channel banks, 65 chargers, 72 battery banks and 3 UPS systems.

Test facilities – OIS-D has two test facilities. The Off-line Test Set located in the shops (M6-791 Rm 110B) and the CIF lab system (M6-342 RM 247). Each test site is equipped with GPA's, CSN and OPS racks used for testing new software and recreating and trouble shooting field problems.

OIS-D is a KSC designed system utilizing both custom and COTS hardware. Software for the system was written in a mixture of 'C' and multiple assembly languages, and is in excess of a million lines of code.

UNIQUE REQUIREMENTS:

OIS-D is a criticality 1S rated system meaning that failure of OIS-D to operate properly during the presence of a hazardous condition could cause loss of life and or vehicle.

FACILITY DESCRIPTION:

The primary OIS-D facilities are located in Building M6-138 (CD&SC) and Building K6-900 (LCC) that serves as system centers. GPAs and DTE equipment are housed in communications rooms located at the LCC, VAB, OPFs, Pads, PCC, CD&SC, VPF, MPPF, PHSF, HSB, O&C, and SSPF. EIs, in addition to being located in facilities occupied by GPAs, are also located at and in CX-J, CX-D, CCF, VABR, OSB, Security Patrol Headquarters, KSCNF, Ammonia Boiler Facility, MLPs, EML, CIF, CRF, HP Gas Facility, M6-961, M7-361, M7-1212, M7-1059, ARF, K6-1298, LSE, LETF, TCF, SAEF-2, MOSB, HMF, plus various boxcars and trailers.

4.2.1.2 Quintron Operational Intercommunication System (OIS-Q)

ADDRESS/LOCATION: KSC Building J6-2313 (LACB), SLF facilities
Crawler/Transporter 1 and 2, Convoy Command
Vehicle, Dryden Shuttle Processing Area (DFRC SPA)

SUPPORT REQUIREMENT: 24 hours x 5 days/week; Weekend call-in
24 x 7 during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

The Quintron Digital Operational Intercommunications System (OIS-Q) is a commercial off the shelf provided by Quintron Systems Incorporated using their DICES III equipment. OIS-Q is used in locations that have minimal or unique communication requirements. Each system consists of a centrally located redundant microprocessor controlled digital switch and the user instruments are fed by twisted pair cable or multi-mode fiber optic cable at T1 data rates. OIS-Q has the ability to integrate telephones, both conventional and point-to-point, paging, radio nets, and voice conferences. There are three systems in place at KSC. They are located at the KSC Shuttle Landing Facility (SLF), Crawler Transporter I and II and two sub mux's with 10 units on the Convoy Command Vehicle. The systems consist of 3 system controllers, five 40-channel communication units, thirty-five 10-channel communication units, and eight T1 channel bank assemblies. A test equipment rack for Quintron is located in the CD&SC (M6-138 RM 131)

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION:

KSC Building J6-2313 (LACB), SLF facilities, Crawler/Transporter 1 and 2, Dryden Shuttle Processing Area (DFRC SPA)

4.2.1.3 Paging and Area Warning System (PAWS)

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC), Building K6-900 (LCC)

SUPPORT REQUIREMENT: 24 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

Paging and Area Warning System (PAWS) - The Kennedy Space Center Paging and Area Warning System is a center wide system designed to provide emergency, operational and administrative announcements to KSC Personnel. The system also provides a series of warning signals for various emergency conditions. The Area Warning signal is used to precede evacuation instructions and/or emergency directives. The Weather Warning Signal precedes weather status announcements. Along with the audio announcements, the PAWS provides flashing beacon and strobe lights in high noise areas.

The PAWS is controlled from two identical control systems, one located in the LCC and the other in the CD&SC. Each serves its respective area. Paging panels are located throughout the LCC and other control areas throughout KSC. All panels are wired to their associated control system. Each control system feeds the paging zones in its respective area. The LCC system feeds all of the LC-39 area, while the CD&SC System feeds the KSC Industrial Area. The two systems are linked together to facilitate all area paging. PAWS has one Bytex matrix switch to deliver T-1's to VDMS.

Each paging area (building/facility) has a subsystem for its own audio distribution and warning lights (if equipped). The associated PAWS Control System interfaces to these local audio distribution subsystems through a standardized PAWS interface called a Control Tray. The audio distribution system takes audio and control signals from the control tray, and distributes them to the speaker networks with one or more power amplifiers. The control tray offers audio feedback and control status back to the control system.

The hazardous operational areas of KSC are required to have redundant PAWS systems. Such areas will have identical redundant paging networks. Some of these areas have reserve power systems as well. The system consists of 50 warning beacons, over 300 power amplifiers, and over 3000 speakers located throughout KSC. PAWS is a KSC designed system utilizing both custom and COTS hardware. Software for the system was written in a mixture of 'C' and Assembly language.

UNIQUE REQUIREMENTS: PAWS is a criticality 1S rated system meaning that failure of PAWS to operate properly during the presence of a hazardous condition could cause loss of life and or vehicle.

FACILITY DESCRIPTION:

The primary Paging facilities are the LCC and CD&SC which house the redundant digital switches PAWS is in approximately 225 buildings and facilities across KSC, PDL, and SERPL.

4.2.1.4 Radio Systems

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC), 500' Weather Tower, SLF, Margo, CM&S

SUPPORT REQUIREMENT: 24 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

The KSC Radio Systems are composed of handheld and mobile transceivers with associated fixed base stations and remote control units. There are two different systems in place, an analog conventional system and a digital trunked system. The contractor shall operate, maintain, and sustain both systems.

The following describes the conventional system: There are 20 networks used in support of specific operational tasks associated with Shuttle and Payload processing, another 8 special networks for SLF Air Ground, Ground Control, and Crawler Transporter operations. Additionally, there are 27 support networks to provide for such functions as security, fire, medical, safety, and base support and maintenance operations.

The operational networks consists of transmitters located at 500 foot weather tower north of VAB and receivers located on 300 foot weather tower at building M6-791, approximately 8 miles south. In addition, the majority of these networks have additional receivers located at the VAB and connect to the network via Spectra-TAC combiners. All networks are interconnected via wire lines and audio bridges and are accessed through tone remote control units and are interfaced to the OIS systems through tone interfaces. Engineering, operations and repair of all base stations and audio interfaces are the responsibility of this contract.

The contractor shall operate and maintain the communications equipment on the convoy vehicle and provide a CDL licensed driver for the vehicle. The contractor shall install and maintain light bars and sirens on emergency vehicles.

Overall the system consists of 43 Base stations, 270 remotes, and approximately 2500 mobiles and portables.

The following describes the trunked system:

The system is a Motorola Smartzone 3.0 system with both a simulcast site and four non-simulcast sites. The simulcast site consists of two-transceivers at Kennedy Space Center, one on the 500 ft weather tower in the LC-39 area, and one on the radio shop tower in the Industrial Area. The non-simulcast sites are at Malibar, Shilo, and at PAFB, and CCAFS. The Air Force also has consoles, radios, base stations, and audio interfaces.

In addition to the equipment associated with a typical trunked system, KSC has 16 interfaces to allow audio cross-patching between conventional radio nets and trunked talk groups (using Base Interface Modules (BIM)), and 56 interfaces to allow audio cross patching between OIS channels and trunked talk groups. Each OIS-to-talkgroup interface is achieved in part via a Radio Control Panel (RCP.) This arrangement appears to the

trunked radio system as if there is a console for every OIS-to-talkgroup patch, and makes KSC very atypical among users of trunked radio systems.

There are two locations on KSC that contain consoles: the LCC contains 6 consoles; the CD&SC contains one console, and a systems manager terminal in the CIF.

There are approximately 1600 portables, 500 mobiles, and 25 base station radios that the contractor must track, program, and maintain.

While the Air Force maintains the equipment at PAFB and CCAFS, this contractor shall maintain the KSC equipment and the shared equipment, and serve as integrator and system engineer of the entire system.

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION:

KSC Building M6-138 (CD&SC), 500' Weather Tower, SLF, Margo, CM&S and Shilo

4.2.1.5 Audio Distribution System

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC), Building K6-900 (LCC), VABR, KSC News Facility, and Banana River Repeater

SUPPORT REQUIREMENT: 24 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

This system consists of 4-wire / 2-wire audio bridges used to distribute mostly non-OIS-D circuits to required operator locations, line conditioning equipment (amplifiers, attenuators, filters, transformers, etc.) and signaling and supervision equipment (direct line service units) for point-to-point telephones.

The audio system also includes a T3C carrier equipped with one M13 multiplexer with a capability of up to 28 T1 circuits between the LCC and the CD&SC. The 12 T1s in use support individual audio circuits.

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION:

KSC Building M6-138 (CD&SC), Building K6-900 (LCC), VABR, KSC News Facility, and Banana River Repeater

4.2.1.6 Voice Distribution Management System (VDMS)

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC), Building K6-900 (LCC), Building K6-1193 (VABR), MILA, Building M7-355 (O&C), Building M6-342 (CIF), SLF, Building (VAB), CCAFS XY, ROCC, PDL, 500' Weather

Tower, JSC, MSFC, Huntington Beach CA, Building
60680 Hangar AE and Hangar L

SUPPORT REQUIREMENT: 24 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and
landings

FUNCTIONAL DESCRIPTION:

The Voice Distribution Management System (VDMS) is a multinodal, multiaggregate multiplexer system for local routing of communication signals in the KSC vicinity. The system routes over 300 operational voice and data circuits within the various sites at KSC, CCAFS, MILA and other locations. The VDMS is the primary interface between the KSC OIS-D System and the NISN Interface which routes KSC circuits to the various other NASA Centers.

The System is comprised of General DataComm (GDC) Megamux Transport Management System Multiplexers and ADC Fibermux Magnum 100 Mbit per second fiber optic multiplexers. The system is located at the CD&SC, with multiplexers throughout the primary communications locations at KSC and CCAFS. The VDMS is monitored by system control computers, which automatically monitor system performance. These computers also control the system. The TMS and Magnum systems are designed to be highly reliable, and will automatically reroute circuits around system failures to the full extent possible. This auto routing feature is essential due to the critical nature of the VDMS function. The network consists of approximately 37 GDC multiplexers fed by 23 Fibermux nodes on five 100 Mbit/sec backbone rings.

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION:

CD&SC, LCC, VABR, MILA, O&C, CIF, SLF, VAB, CCAFS XY, Hangar AE and Hangar L

4.2.1.7 Astrocomm System

ADDRESS/LOCATION: Building K6-900 (LCC), CD&SC

SUPPORT REQUIREMENT: Staffed as required; Weekend call-in
24 hours x 7 days/week during major tests, launch, and
landings

FUNCTIONAL DESCRIPTION:

The Shuttle Astrocomm system provides interconnection of five Orbiter on-board voice circuits to the LCC control room consoles and OIS-D. Two independent intercommunication circuits are tied directly from the LCC to the Orbiter via umbilical cables. Two independent air-to-ground (A/G) full-duplex, S-band radio circuits are via the MILA Unified S-Band (USB) Spaceflight and Tracking and Data Network (STDN)

Station, and one A/G half-duplex, ultra-high frequency (UHF) radio circuit is via the MILA USB STDN Station.

UNIQUE REQUIREMENTS:

Astrocomm is a criticality 1S rated system meaning that failure of Astrocomm system to operate properly during the presence of a hazardous condition could cause loss of life and or vehicle.

FACILITY DESCRIPTION:

LCC, CD&SC, Pad A, Pad B, OPF 1, 2, 3

4.2.1.8 Voice Recording System

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC),

SUPPORT REQUIREMENT: 24 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

Record and Playback system (RPS) records all 1024 OIS-D channels through redundant Ampex recorders. Two Dictaphone 9000's are capable of recording 240 channels and are utilized for radio nets, paging circuits and certain telephones. A Dictaphone Freedom system with 12 T-1 recorders and three 16 channel analog recorders is also used. Voice duplications are made on cassette tapes for operational analysis. In addition there are 3 20-channel recorders and 1 20-channel recorder to support the 2 crawler transporters and the Transportable Communication System (TCS).

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION: KSC Building M6-138 (CD&SC)

4.2.1.9 Public Affairs Audio Systems

ADDRESS/LOCATION: KSC News Facility

SUPPORT REQUIREMENT: 8 hours x 5 days/week and as required for special events

FUNCTIONAL DESCRIPTION:

Audio support, consisting of audio signal amplification, transmission, conditioning, switching, and distribution is provided by fixed equipment in the KSC news facility and from portable systems. Audio support is provided for events such as Shuttle launches, landings, and rollouts; astronaut arrivals; unmanned launches; Air Force launches; press briefings; NASA briefings; and other special events.

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION:

Banana Creek VIP area, West Causeway area, East Causeway area, Static Test Road, North Kennedy Parkway, Banana Creek Astronaut Dependents area, and the Mid-field Park Site.

4.2.2 Visual Imaging and Timing Communications Services

The contractor shall provide visual imaging and timing communications services and support end-to-end configuration and validation to meet operational and institutional requirements at KSC and the NASA occupied facilities at the CCAFS.

The systems associated with these services include but are not limited to the following:

4.2.2.1 Operational Television (OTV)

ADDRESS/LOCATION: LC-39, LC-39 Pads A & B, Industrial Area

SUPPORT REQUIREMENT: 24 hours x 5 days/week, Weekend call-in during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

The Operational Television system provides general closed circuit television support to NASA operations on KSC. The system includes visual surveillance support to Shuttle, Payloads/ISS and Security operations and has equipment located in the LC-39 and Industrial areas.

4.2.2.1.1 Launch Complex 39 Shuttle Operations Television

ADDRESS/LOCATION: Operational Television Control Center; LCC, Bldg. K-6-900, Room 1P2. End Items: Launch Control Rooms 1-4, LC-39 Pads 39 A and B. Vehicle Assembly Bldg, K6-848, and OPF 1, 2, and 3

SUPPORT REQUIREMENT: 24 hours x 5 days/week, Weekend call-in during major tests, launch and landings

FUNCTIONAL DESCRIPTION:

Video cameras mounted in protective housings on pan and tilt units throughout the LC-39 Pad sites, VAB and OPF's are remotely operated from Television Control Center (TCC) in the LCC. An analog video switch and control system in the TCC allows for the input of 192 cameras to be sent out to any (or all) of 512 output destinations. The switch may also be controlled from individual console locations located in the Launch Control Rooms 1-4 and associated management areas. Additionally, there are remote controls for

the video switch assigned outputs located in the KSC Industrial Area and at JSC and MSFC. Also in the TCC is the video recording system for original recordings, duplication and dubbing. The OTV system provides recording formats in both digital broadcast quality and commercial analog quality depending on the identified requirement. Timing equipment for time registration on the live and recorded video is also located in the TCC. Approximately 75 Video Cameras and their associated pan and tilt apparatus are connected per pad to the Pad Terminal Connection Room (PTCR) via the NASA designed TV-39 cables. In the PTCR, the Camera Control Unit dissects the TV-39 signals, separating control from video. Baseband video signals are multiplexed (via WDM) onto fiber optic cables for transmission back to the television control center. In the LCC, the video is demodulated from the carrier frequencies, amplified and fed into a 192 X 512 Grass Valley Video Switch, and directly transmitted to over 500 monitors and test locations. Approximately five channels of the switcher output are fed to BCDS for general distribution.

Additional surveillance cameras include 9 color cameras located in the transfer isles of the VAB and 9 color cameras, 3 in each the three OPF Highbays.

The LC-39 OTV system is currently being upgraded to a digital system through the OTV-Digital (OTV-D) project. This project provides for the transition of the current analog camera, routing and control system to a Unified Control System (UCS) for the implementation of a Serial Digital Interface (SDI) closed circuit surveillance system. The digital transition schedule requires that the new digital system and the current analog system co-exist for a number of years. Currently, the OTV system has the Digital Switch, the Video Processing and Distribution system and the digital unified control system installed and operational. The OTV-D implementation schedule calls for the replacement of analog cameras with SDI cameras in groups of approximately 30 per year for the next several years. The analog OTV system will be totally decommissioned by 2007.

UNIQUE REQUIREMENTS:

The LC-39 Shuttle Operations Television system cameras are required to be environmentally housed for long-term exposure to the Florida climate. Cameras mounted on the Pad structure are also required to withstand conditions associated with Shuttle engine and booster exhaust.

FACILITY DESCRIPTION:

LCC, Bldg. K-6-900, Rm. 1P2; Launch Control Rooms 1-4; LC-39 Pads 39 A and B; Vehicle Assembly Bldg, K6-848; and OPF 1, 2, and 3.

4.2.2.1.2 Industrial Area Operational Television

ADDRESS/LOCATION: Operations Control, O&C, M7-355: End Item
Surveillance Systems; VPF, M7-1469, SAEF II, M7-1210 and PHSF, M7-1354

SUPPORT REQUIREMENT: Regular 1st Shift operations, exceptions during major Shuttle and Payloads Processing and Mission events

FUNCTIONAL DESCRIPTION:

The Industrial Area CCTV System provides visual information distribution between the several payloads handling facilities including (but are not limited to), the Operations and Check-out (O&C) Bldg, the Vertical Processing Facility (VPF), the Payload Handling and Safing Facility (PHSF), the Spacecraft Assembly and Encapsulation Facility II (SAEF II) and the Space Station Processing Facility (SSPF). The Industrial Area system is designed to provide for a central routing center (O&C) which will distribute video information from the various facilities to various user groups, safety, and security personnel, located throughout KSC. Applicable functional subsystems are: approximately 150 Black and White and color Cameras and remote controlled Pan and Tilt units located throughout ISS and Payloads facilities, 500 Monitors, O&C and SSPF Routing Switch's, Distribution, and Synchronization, Video Recording, duplication and dubbing equipment.

The O&C is Television Control Center is the operations center for the Industrial Area Operational Video Sub-systems. The heart of the O&C video system is a 128 x 400, XY routing switch. This system interfaces directly with outputs from the SSPF switch (96 x200) and the LC-39 OTV switch (192 x 512). This system provides different payload test conductors and service personnel visual information from major operational areas at different stages of in-process testing and mission milestones and to more than one payload customer at one time.

UNIQUE REQUIREMENTS:

None

FACILITY DESCRIPTION:

O&C, M7-355; VPF, M7-1469; SAEFII, M7-1210; PHSF, M7-1354; SSPF, M7-360

4.2.2.2 KSC Public Affairs Television (KSCTV)

ADDRESS/LOCATION: KSC Press Site, Television Control Facility, Bldg. K7-1205

SUPPORT REQUIREMENT: Regular 1st Shift operations, exceptions during major events

FUNCTIONAL DESCRIPTION:

During NASA missions, KSCTV produces live, continuous broadcast quality, audio and video coverage of launch and landing, Shuttle downlink video, news conferences, and other events as available, in response to the documentary, engineering, and Shuttle and LSPO television requirements for public release. The system at the Press Site provides technical operations for both broadcast quality audio and video programming.

During launch and landing, Engineering News Gathering (ENG) teams are sent to required sites around KSC to provide primary video sources used to create NASA TV programming. These isolated video feeds are individually distributed live to the media for creating independent programming. Unedited Tracking views from each camera are replayed on NASA TV shortly after the event. For major mission milestones and special

events NASA TV originates at KSC, and is transmitted to other NASA Centers and disseminated to the public through the use of the KSC video uplink capability, either as real time or near real time delayed broadcasts.

KSCTV also provides original programming development, postproduction editing and original broadcast quality recordings of identified PAO requirements. KSCTV also produces both broadcast and commercial quality videotape and DVD formatted duplications and dubs.

KSCTV provides technical support to operational requirements on the KSC Press Mound. The Mound provides a centralized location for media personnel to assemble and interface with the KSCTV system. The Mound has provisions for direct video feed distribution of the NASA remote cameras to the News Media. There are 19 distribution boxes located around the Press Mound with 24 isolated video outputs and 1 RF feed which includes the local broadcast channels.

In addition to these feeds there are also, 4 small stump boxes, each providing 5 NASA TV baseband feeds and 5 RF feeds. Eighteen positions in the grandstands have feeds of baseband NASA TV, RF signals and NASA TV Audio. A total of 52 RF cable drops are provided in the stump boxes.

UNIQUE REQUIREMENTS:

Contractor support personnel for PAO are required to be accomplished in their assigned areas of support and able to provide creative and technically proficient products with a minimum of NASA direction and oversight. The contractor shall provide personnel to support Landing Convoy operations.

FACILITY DESCRIPTION:

KSC Press Site, Television Control Facility Bldg. K7-1205; Various UCS and field tracking sites around KSC

4.2.2.3 Broadband Communications Distribution System (BCDS)

ADDRESS/LOCATION: LCC, Bldg. K6-900, Head End, CIF Bldg. M6-342, Antenna farm, all major NASA facilities on KSC

SUPPORT REQUIREMENT: Regular 1st Shift operations, exceptions during major events

FUNCTIONAL DESCRIPTION:

Broadband Communications Distribution System (BCDS) is a hybrid fiber/coaxial cable television distribution system. The system consists of both digital and analog channels. The basic function of the broadband system is to provide local KSC origination and off-air television channels to various users at KSC and CCAFS.

The KSC BCDS is a Mid-Split Cable Television Broadband system that provides distribution of Television to most of the major KSC facilities and acts as a headend feed for cable TV distribution at CCAFS. The BCDS is comprised of a consolidated headend, delivering signals to the cable distribution system in the Industrial Area, the cable distribution system in the LC-39 Area, and to CCAFS. The system is capable of

providing 63, 6 MHz cable TV channels. Program sources include; Local KSC operational video from both the Payloads and Shuttle Operational areas, Off-Air Commercial Channels, C-Band and KU-Band Satellite feeds, video taped training material. The system currently services approximately 12,000 TV drops. Origination sources include local off-air antennas, satellite dishes, and outputs from a Grass Valley video switch located in the LCC and the Payloads/SSPF switch located in the O&C and SSPF. Baseband signals from the video sources are modulated, processed and distributed using COTS television equipment.

UNIQUE REQUIREMENTS:
None

FACILITY DESCRIPTION
LCC, Bldg. K6-900; CIF Bldg, M6-342; CCAFS, XY Bldg; All major facilities in the both the Industrial and LC 39 areas of KSC.

4.2.2.4 Timing & Countdown (T&CD)

ADDRESS/LOCATION: Throughout KSC

SUPPORT REQUIREMENT: Regular 1st Shift operations, exceptions during Shuttle events

FUNCTIONAL DESCRIPTION:
Timing and Count Down (T&CD) signals are generated and distributed from two Central Timing Stations in the LCC and CIF to all areas of KSC and systems as needed (LPS, OTV, Photo, Transmission Systems, etc). Timing reference signals are distributed on a continuous basis while Count Down signals are provided as needed for Launches and system testing including payload checkout. Each Central Timing Station consists of 16 equipment racks, operational consoles with timing management computers, test equipment and bench repair stations. Additional distribution/signal conditioning equipment is found throughout KSC in Communication rooms. Also, over 400 T&CD displays are distributed over KSC. The T&CD systems are operated and maintained through a Joint Services Contracts (F08650-94-C-001) with the United States Air Force, however, the contractor shall be responsible for sustaining engineering for KSC facilities.

UNIQUE REQUIREMENTS:
None

FACILITY DESCRIPTION:
Major operational and administrative facilities on KSC

4.2.2.5 Photo Services

The performance period for this section begins October 1, 2004.

The contractor shall provide motion picture, still photographic, digital and video products and services for NASA, Commercial ELV and DOD customers at both KSC and CCAFS. This includes support to institutional (as requested) and engineering requirements. The contractor shall develop and maintain the Photographic Acquisition Distribution Document (PADD) that documents how the contractor will support each photographic Program requirement. The contractor shall develop and provide a copy of the PADD to NASA for Terminal Countdown and Demonstration Tests (TCDT), Launch and End Of Mission (EOM) and any other mission test that requires photographic support per DRD-T-6. The contractor shall develop and deliver to NASA on a monthly basis a list of products and cost on a work order basis per DRD-T-5. The contractor shall develop and provide to NASA, as described in DRD-T-4, post mission operational evaluations which identify which requirements were met and which were not, the cause of the failure to meet the requirement and the proposed corrective action. All launch images are considered potentially critical for anomaly investigation as well as useful in validating nominal launch performance and, therefore, should be as sharp and properly exposed as technically possible. Chemical photo processing shall be performed external to government property. One technical representative shall be present in the Range Operations Control Center (ROCC) during launch operations for coordinating with all photographers. All launch multi-media package images are considered potentially critical for anomaly investigation as well as useful in validating nominal launch performance and, therefore, should be as sharp and properly exposed as technically possible.

4.2.2.5.1 KSC/Shuttle Photo Support

ADDRESS/LOCATION: Photo Services Operations Building 1605 CCAFS, Operational Area End Items: LC-39 Pads 39 A and B; KSC Headquarters, Press Site; CCAFS, KSC, and Brevard County

SUPPORT REQUIREMENT: 8 hours x 5 days/week; Weekend call-in; Mission Prep and set-ups; L-5 hrs through film retrieval during Launch and Landing events

FUNCTIONAL DESCRIPTION:

The contractor provides motion picture, still photographic, digital and video products and services. This includes support to institutional and engineering requirements. The contractor shall develop and maintain the Photographic Acquisition Distribution Document (PADD) that documents how the contractor will support each photographic Program requirement.

Institutional still products primarily include (but are not limited to), processing of negative film, 8x10, 11x14 and 16x20inch color prints and digital still hardcopy and video products including (but not limited to), broadcast and commercial formatted video tape recordings, duplication and dubbing, film to tape transfer, program creation and

recording, and digital video CD and DVD archiving and duplication. The services include (but are not limited to), on-call photographers and videographers, media customer service interface, digital video production programming development, distribution, duplication, dubbing and archiving, optics and photo equipment repair and maintenance, broadcast and High Definition video productions and digital still image services including scanning and digital image manipulation and CD/DVD archiving. The contractor shall maintain the official NASA KSC motion picture and still film photographic and digital products archives in the KSC HQ building. The contractor shall also maintain the PAO photo, video and digital products archives located at the Press Site. The contractor shall provide a method for customers to retrieve archived documents.

The photographic acquisition activity is a photographic motion picture and still frame recording process that provides high-resolution film records of shuttle operations. The photographic acquisition system utilizes cameras that are a mixture of Mitchell, Milliken, and Photosonic motion picture cameras. They are primarily 35 and 16mm but do include 70mm Photosonics. The still cameras are composed of 35mm and 70mm Hasselblads, Hulchers, and Nikons. The motion picture cameras operate at 3 fps for fueling cameras to 400 fps on the perimeter. The contractor shall provide sustaining and repair maintenance on the GFP film camera and associated assets.

The contractor shall provide, through government furnished property, optical tracking mount set-up, operations and maintenance. The contractor shall install required photographic camera and lens assemblies as identified in requirements documents on both optical and metric tracking assets. All launch images are considered potentially critical for anomaly investigation as well as useful in validating nominal launch performance and, therefore, should be as sharp and properly exposed as technically possible.

Metric tracking assets are defined as tracking telescopes providing azimuth and elevation information back to the Range Operations Control Center (ROCC) for inclusion in the range safety equation. The contractor is not required to provide operations or maintenance to metric tracking assets.

UNIQUE REQUIREMENTS:

The photo acquisition instruments are required to be environmentally housed for long term exposure to the elements associated with shuttle engine and booster exhaust and year round operation in the Florida climate. The contractor shall support Landing Convoy operations.

FACILITY DESCRIPTION:

CCAFS: Building 1605, Collimation Area of Building 1619, ½ Hangar G; Launch Complex 39; Pads 39 A and 39 B; SLF, KSC Headquarters Building, PCC room 3062.

4.2.2.5.1.1 Photo Optical Control Systems (POCS)

ADDRESS/LOCATION: PCC; LC-39 Pads; SLF

SUPPORT REQUIREMENT: Operational Hours during major tests, Launch, and Landings

FUNCTIONAL DESCRIPTION:

The contractor shall support engineering Shuttle requirements through the operation of the Photo Optical Control System (POCS). The POCS is a photographic motion picture and still frame event start, stop, and logging system that initiates and transmits camera control signals to film cameras.

The cameras are a mixture of Mitchell, Milliken, and Photosonic motion picture cameras. They are primarily 35 and 16mm but do include 70mm Photosonics. The still cameras are composed of 35mm and 70mm Hasselblads, Hulchers, and Nikons. The motion picture cameras operate between 3 fps and 400 fps.

A major component of the POCS is the Control and Acquisition Module (CAM). The CAM interfaces directly with the cameras and controls and monitors the cameras functions and parameters at various sites. These sites also house the electro/optical transceivers (FOTS) along with the multiplexers/demultiplexers. The CAM to FOTS interface is a Serial RS-422, with base function rate of 9600 baud. The FOTS link back to the PTCR is 1550 nm and 1300 nm. In the PTCR, there are patch panels that route the CAM signals to the Process Control Center (PCC).

There are two NASA custom designed Communications Control System's (CCS) with redundant connections to the FOTS's in the PCC. The CCS can be controlled and monitored from a number of workstations via Ethernet connections.

There are 52 cameras on the Fixed Service Structure /Mobile Launch Platform. System elements include cameras (dry closures--stills, non Automatic Exposure Control), and CAM/camera units. The POCS software supports 512 CAM/Camera units at Pad A, 512 at Pad B, and 512 RF units. Remote cameras may be started using POCS RF start signals or other approved actuation methods and devices. There are 300 operational CAMs.

UNIQUE REQUIREMENTS:

POCS requires computer operational configuration per the Photographic Acquisition Distribution Document (PADD) prior to mission support.

FACILITY DESCRIPTION:

Photo Optics Control Room is located in the PCC room 3062.

4.2.2.5.1.2 KSC/NASA Digital Photo Services Support

ADDRESS/LOCATION: Photo Services Operations Building, 1605 CCAFS, Operational Areas; KSC HQ, Press Site

SUPPORT REQUIREMENT: 8 hours x 5 days/week; Weekend call-in, Press Site operational hours during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

The contractor shall provide Digital Photo Services operations at the KSC Press Site with dedicated personnel and services to support Public Affairs requirements for the

acquisition, programming production and distribution of digital still and Webcast video to the media and general public via the Internet.

Digital Photo Services photographers and videographers provide on-call support for the covering of daily news events including in-depth coverage of launch and landing activities and events, including the documentation of VIP visitors. The contractor shall provide the support to interface with the accredited media and coordinates the distribution of both video and still imaging products. The contractor shall provide support to NASA for distribution of digital still images, photographic hardcopy prints and electronic images locally and via the Internet. Webcast technicians and producers provide support to the Webcast Studio live streaming video, original program development and encoded video clips for distribution via the Internet as a feature of NASA services.

Digital still and video services, for KSC organizations other than Public Affairs, are provided by the Digital Photo Services contractor, in a separate digital imaging facility, located in the KSC Headquarters building.

UNIQUE REQUIREMENTS:

Contractor support personnel for PAO are required to be accomplished in their assigned areas of support and able to provide creative and technically proficient products with a minimum of NASA direction and oversight. The contractor shall provide Digital Photo Services at the Press Site to support the operational hours that the Press Site is open to the media and all directed coverage of NASA designated news worthy events.

FACILITY DESCRIPTION:

KSC Press Site, News Facility, Webcast Studio, KSC Headquarters.

4.2.2.5.2 Commercial ELV Photo Support

ADDRESS/LOCATION: Photo Services Operations Building 1605 CCAFS, Operational Area End Items: Launch Complexes; 17 A and B, 36 A and B, 40 and 41.

SUPPORT REQUIREMENT: Mission prep and set-ups; Weekend call-in L-5 hrs through film retrieval during major tests and Launches

FUNCTIONAL DESCRIPTION:

The contractor shall provide motion picture, still photographic and video products and services. This includes support to institutional (as requested) and engineering requirements. The contractor shall develop and maintain the Photographic Acquisition Distribution Document (PADD) that documents how the contractor will support each item of the commercial launch photographic requirements package. Institutional products will be available as requested and primarily include (but are not limited to); processing of negative film, 8x10, 11x14 and 16x20 inch color prints and digital photographic still products. The services include (but are not limited to); on-call photographers and videographers, optics and photo equipment repair and maintenance, video presentation productions and digital image services including scanning and digital image manipulation and photo CD recording. The contractor shall maintain a means of

accepting payment directly from the commercial customer using standard commercial methods.

The contractor shall support commercial launch requirements through operational functions of a photographic acquisition system. This is a photographic motion picture and still frame initiation and recording system that provides high-resolution film records of launch operations. The system provides camera start signals to the cameras. The PADD defines the required film type for each support.

The contractor shall provide, through government furnished property, optical tracking mount set-up, operations and maintenance. The contractor shall install required photographic camera and lens assemblies as identified in requirements documents on both optical and metric tracking assets. Metric tracking assets are defined as tracking telescopes providing azimuth and elevation information back to the Range Operations Control Center (ROCC) for inclusion in the range safety equation. The contractor is not required to provide operations or maintenance to metric tracking assets.

The cameras used are a mixture of Mitchell, Milliken, and Photosonic motion picture cameras. They are primarily 35 and 16mm but do include 70mm Photosonics. The still cameras are composed of 35mm and 70mm Hasselblads, Hulchers, and Nikons. The motion picture cameras operate between 3 fps and 400 fps. The contractor shall provide sustaining and repair maintenance on the GFP film cameras and associated assets.

UNIQUE REQUIREMENTS:

The photo system acquisition instruments are required to be environmentally housed for long term exposure to the elements associated with engine and booster exhaust and year round operation in the Florida climate. Requirements for operational support are documented in the Photographic Acquisition Distribution Document (PADD) for commercial customers.

Photographic requirements for commercial Launch customers will be priced as a package. Items over and above the package will be priced individually. Commercial customers will be able to order and pay for products and services using established commercial billing methods.

FACILITY DESCRIPTION:

CCAFS: Building 1605, Collimation Area of Building 1619, ½ Hangar G, Launch Complexes; 17 A and B, 36 A and B, 40 A and B.

4.2.2.5.3 DOD Technical Multi-Media Support

ADDRESS/LOCATION: DOD Multi-Media Support, Building 1605, ROCC (CCAFS)
Collimation Bed: SE Area of Building 1619 (CCAFS)
Tracking Sites: Universal Camera Sites (UCS) (CCAFS and KSC) and Brevard County
Launch Complexes: 17A, 17B, 36A, 36B, 40, 41 (CCAFS)
Tracker Storage: ½ Hangar G(CCAFS)

SUPPORT REQUIREMENT: DOD Multi-Media Desk (0730-1630 workdays)
Mission preps and set-ups (as required)
Weekend call-in (as required)
L-5 hrs through film retrieval during launches

FUNCTIONAL DESCRIPTION:

The technical multi-media support contractor shall provide still photographic, motion picture film, and video products and services to DOD customers. This shall include major support to launch engineering requirements, and general support to institutional customers on a less critical basis. The contractor shall develop and maintain the DOD Multimedia Photographic Acquisition Distribution Document (PADD) that documents how the contractor will support each item in the DOD Launch Multi-Media Package. Support for the DOD Expendable Launch Vehicle (ELV) programs shall be priced as a complete set of products and services for an agreed upon set of basic requirements. Additional launch multi-media items not included in the package shall be priced individually for the DOD customer and separated in the subject PADD. The PADD shall contain only those items listed in the customer's applicable delivery order and coordinated with the DOD Program Manager (PM). All DOD customers shall be able to order and pay for all technical multi-media support products and services using established commercial billing methods.

UNIQUE REQUIREMENTS:

The cameras and supporting equipment on a launch pad or a tracker are required to be environmentally housed due to moisture, vibration, and heat associated with launch blasts and year-round operation in the Florida climate. PADD requirements shall be coordinated with other listings in Universal Documentation System (UDS) requirements for launch pad and Universal Camera Sites (UCS) support for timing, metrics, communications, and power from, or through, other Range contractors.

A launch package and all additional multi-media products and services requested in a delivery order supporting a DOD launch shall be considered complete when at least 90% of the total number of multi-media requirements (camera operations, developed films, finished media) meet industry standards for imaging, processing, and end product quality. (The contractor shall furnish the PM all follow-up documentation regarding corrective actions and/or process improvements following each launch.)

4.2.2.5.3.1 DOD Basic Launch Multi-Media Package

The contractor shall furnish all necessary services and supplies in meeting the requirements of a Basic Launch Multi-Media Package of products and services as a fixed-price item (including, but not limited to: all related management, administrative, labor, off-site film processing, operations and maintenance (O&M), repair, and technical overhead support in the "per event charge" for launch image packages). The contractor shall have the option to use any mix of available government-furnished equipment supplemented with contractor-owned equipment and accessories. Complete launch multi-media packages shall be delivered to the customer within 4 workdays after the

launch (exceptions specified elsewhere in this section), including the DOD Multimedia Performance-Production Report.

A basic launch multi-media package shall include the acquisition of an extensive number of critical launch images (still and motion media formats) that are documented from various locations and viewpoints, on and near the launch pad prior to launch and throughout the visible launch trajectory, from nearby sites on the perimeter to sites several miles away requiring the use of short, medium and long distance focal length lenses and cameras with various frame rates and exposure controls. One technical representative shall be present in the Range Operations Control Center (ROCC) during launch operations for coordinating with all photographers. All launch multi-media package images are considered potentially critical for anomaly investigation as well as useful in validating nominal launch performance and, therefore, should be as sharp and properly exposed as technically possible.

Prior to any action being taken, the contractor will coordinate with the DOD customer technical representative in developing the Photographic Acquisition Distribution Document (PADD). No other support may be initiated prior to government approval of the PADD. Prior to approval of the PADD, the contractor must present proof that all Associate Contractor Agreements (ACA's) are current, and an Emergency Call Back/Alert Photography Plan is in place. The plan shall provide for image acquisition within 30 minutes after notification to the photographer during normal duty hours, and 60 minutes after notification after normal duty hours.

Launch multi-media images acquired and processed from each motion camera or available video source (as itemized in the PADD) shall be arranged, properly oriented, color-balanced as necessary, and transferred into one digital video master (video string-out), including captions, titles and labels. Images acquired from each of the several still cameras (film and digital) listed in the PADD shall be proofed on paper, with significant images of interest posted electronically for customer review via web/LANS. Approved selections for press release and archiving, or requested as additional prints, shall also be transferred to high-resolution TIFF files onto a CD/DVD master properly labeled and indexed within 30 days following a launch, with the master placed in the DOD media file in the KSC HQ building and one copy delivered to the PM.

Basic launch multi-media packages include separate original processed film and combined images transferred from original processed film, intermediate processed film prints to preclude damaging original film during video transfers, and finished end products that depend on the successful operations per DOD launch of the following camera requirements summary:

- (30) 16mm motion picture film cameras/film, 24 to 400 fps
- (4) 35mm motion picture film cameras/film, 32 to 96 fps
- (3) 70mm or motor-driven medium-format still film cameras with 15' of film
- (2) Medium-format still film cameras/film
- (2) 35mm cameras with 24-exp film or 25 images from high-resolution digital cameras

(1) Professional video camera, images recording DOD pre-launch/launch activities

Cameras and lenses used for launch imaging shall be a proper mix of handheld cameras, cameras on a tripod as appropriate, cameras mounted in fixed explosion-proof boxes, cameras mounted on contractor-operated non-metric trackers, and cameras co-mounted on metric trackers/large telescopes operated by the DOD Range Technical Services Contractor (RTSC). The contractor shall have an Associate Contractor Agreement (ACA) with the contractor operating and maintaining the metric trackers. The contractor shall have access to these video feeds (or acquire videotapes recorded at metric sites) for inclusion in the video string-out master within the basic launch multi-media package. A quick-look video clip (SVHS) of all non-film motion items, including video portions of the pre-launch activities, shall be available within 6 hours after a launch, and shall be listed in the PADD.

The contractor shall provide all required ancillary services supporting equipment preparation if not optionally available from other contractors, such as obtaining timing and making arrangements for additional lighting support and/or generator support and/or crane support. The contractor shall support F-1 day/night operations in coordination with the Range schedule, confirm proper set-ups/green lining at the proper times, purging camera boxes as necessary, replacing any damaged port glass after launches, and providing proper loads of camera films with subsequent film retrieval and equipment removal. The contractor shall provide for all required transportation, shipping, labeling, filing, developing, processing, inter-negatives, corrections, film-to-video transfers, and ultimately ensure that the string-out video and selected 8x10 prints meet professional standards of the highest quality.

In addition to all original processed films, intermediate transfers and the string-out master defined as end products in the basic launch multi-media package, the package also includes one SVHS tape and three DVDs of the complete video string-out of consolidated motion media (added to the quick-look video portion), all delivered within 4 workdays after each launch. Distribution offices for these four items shall be annotated in the preparation of the PADD in coordination with the PM. All additional copies shall be ordered and paid for outside the package.

One Public Affairs releasable quality digital still image of the DOD launch vehicle on the pad and two Public Affairs releasable quality digital images of the vehicle in flight shall be available to the DOD Public Affairs within 4 hours after each launch. Public Affairs images approved for posting on the web and LANS by the contractor shall be at least 1600x1200 pixel resolution and unlocked for downloading. These 3 digital launch images shall remain posted by the contractor on the web/LANS for 30 days after each DOD launch. The contractor shall accept additional paper print orders not in a package of posted launch images at published prices, such as higher-resolution color enlarged paper prints, from all DOD customers via web/LANS communications.

All other still images acquired for a launch multi-media package shall be proofed. All selections to be printed shall be scanned and/or downloaded to CD(s) or a DVD (raw and

corrected images as necessary) as part of the package. The basic launch multi-media package also includes three 8x10 prints of the pre-launch vehicle and three 8x10 prints of the launch vehicle in flight, with captions printed on backs of all prints within 4 workdays.

Distribution of the above mentioned six prints and digital files for 45 SW/PA and Air Force Accessioning shall be annotated in the preparation of the PADD in coordination with the PM. All other requested copies shall be ordered and paid for outside the package price. Requirements added to the basic launch multi-media package by the customer shall be clearly separated in the PADD for proper tracking, billing and reconciliation purposes.

Launch film negatives shall be sleeved, labeled and properly stored locally for at least 90 days after each launch. Launch motion picture film and video masters, still image master CDs and master DVDs shall be labeled, filed and stored locally for at least 90 days after each DOD launch, including proof sheets, indexes and data captions (except for the three approved still image selections to be sent to the Air Force Accessioning Office within 30 days after a launch.)

The DOD local media files in the KSC Headquarters building shall be purged of launch package items that have been retained longer than one year. Purged media shall be offered without charge, in turn, to the applicable DOD Launch Program Office, Eastern Range Visual Information Manager/PM, Air Force History Office, and CCAFS Museum before discarding. The only long-term storage of local DOD media in the KSC Headquarters building shall be limited to Public Affairs high-interest images or historically significant multi-media of both launch and non-launch activities.

Summary List of End Products in a DOD basic launch multi-media package (due within 4 workdays after launch, exceptions listed below and described previously in this section):

1. Quick release digital stills: at least three selections on web/LANS, within 4 hours
2. Quick release video clip: one SVHS, within 6 hours
3. Proof sheets of all still film: within 4 work days
4. All processed films, original and inter-negatives/positives: within 4 work days
5. Prints, six 8x10 color prints: within 4 work days
6. Complete motion media string-out video, one SVHS and three DVDs (additional may be required if longer than 2 hour): within 4 work days
7. CD(s) (or one DVD) of all still images selected for printing: within 30 calendar days

4.2.2.5.3.2 DOD Launch Scrub

During the Range countdown (launch minus 360 minutes), if a launch is rescheduled to another day, the contractor shall charge this amount to defray the expense of the ongoing activities that must be reaccomplished in preparation for the fixed price launch multi-media package.

4.2.2.5.3.3 DOD Launch Slip

If a change to an obligated launch date occurs with less than a 2-week notice prior to initiating the Range countdown, the contractor shall charge this amount to defray the expense of the ongoing activities that must be reaccomplished in preparation for the fixed-price launch multi-media package.

4.2.2.5.3.4 DOD Additional Camera/Film/O&M (16mm MOPIC)

An additional 16mm motion picture camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include a full load of film, cameraman and support technicians, processing, film-to-video transferring and all related O&M services and supplies, with the additional camera pointed and mounted within a fixed, explosion-proof box or mounted on a tracker or as a stand alone camera, per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD and the video string-out master in the launch multi-media package within this additional fixed-price charge. More than one additional 16mm motion picture camera shall be available to a customer at the same additional unit charge per additional same type camera.

4.2.2.5.3.5 DOD Additional Camera/Film/O&M (35mm MOPIC)

An additional 35mm motion picture camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include a full load of film, cameraman and support technicians, processing, film-to-video transferring and all related O&M services and supplies, with the additional camera pointed and mounted within a fixed, explosion-proof box or mounted on a tracker or as a stand alone camera, per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD and the video string-out master in the launch multi-media package within this additional fixed-price charge. More than one additional 35mm motion picture camera shall be available to a customer at the same additional unit charge per additional same type camera.

4.2.2.5.3.6 DOD Additional Camera/Film/O&M (70mm)

An additional 70mm or medium format still camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include 15 foot load of film, cameraman and support technicians, processing, proof prints and/or CD and all related O&M services and supplies, with the additional camera pointed or mounted or tracked per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD within this additional fixed-price charge. More than one additional 70mm or medium format camera shall be available to a

customer at the same additional unit charge per additional same type camera. Appropriate flash (including explosion-proof types as required), filters and accessories are also included.

4.2.2.5.3.7 DOD Additional Camera/Film/O&M (35mm Still)

An additional 35mm still film camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include a 24-exposure load of film, cameraman and support technicians, processing, proof prints and/or CD and all related O&M services and supplies, with the additional camera pointed or mounted or tracked per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD within this additional fixed-price charge. More than one additional 35mm still film camera shall be available to a customer at the same additional unit charge per additional same type camera. Appropriate flash (including explosion-proof types as required), filters and accessories are also included.

4.2.2.5.3.8 DOD Additional Camera/Recording/O&M (Still Digital)

An additional high-resolution digital still camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include cameraman and support technicians for up to 25 TIFF images, digital downloading and processing, proof prints and/or CD and all related O&M services and supplies, with the additional camera pointed or mounted or tracked per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD within this additional fixed-price charge. More than one additional digital camera and operations shall be available to a customer at the same additional unit charge per additional same type camera. Appropriate flash (including explosion-proof types as required), filters and accessories are also included.

4.2.2.5.3.9 DOD Additional Camera/Recording/O&M (Video)

An additional video camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include cameraman and support technicians, recording, digital processing and all related O&M services and supplies, with the additional camera pointed, mounted, or tracked per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD and the video string-out master in the launch multi-media package within this additional fixed-price charge. More than one additional video camera shall be available to a customer at the same additional unit charge per additional same type camera.

4.2.2.5.3.10 DOD Additional Camera/Recording/O&M (Infrared)

An infrared video camera and appropriate lens may be ordered and added to the basic launch multi-media package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include cameraman and support technicians, recording, digital processing and all related O&M services and supplies, with the additional camera pointed, mounted, or tracked per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD and the video string-out master in the launch multi-media package within this additional fixed-price charge. More than one additional video camera shall be available to a customer at the same additional unit charge per additional same type camera.

4.2.2.5.3.11 DOD Additional Camera/Recording/O&M (High-Definition Video)

A high-definition video camera and appropriate lens may be ordered and added to the Basic Launch Multi-Media Package by the DOD customer for an additional charge at time of delivery order issuance. This additional fixed price charge shall include cameraman and support technicians, recording, digital processing and all related O&M services and supplies, with the additional camera pointed, mounted, or tracked per the customer's additional requirement. The additional imaging requirement shall also be added to the PADD and the video string-out master in the launch multi-media package within this additional fixed-price charge. More than one additional video camera shall be available to a customer at the same additional unit charge per additional same type camera.

4.2.2.5.3.12 DOD Additional Services

Additional services shall include but are not limited to: on-call photographers and videographers (Emergency Call-Back/Alert Photography Plan), scheduled photographers and videographers, optics and photo equipment repairmen, multi-media presentation specialists, video editors, and digital image specialists.

These services will be priced per labor hour and billed to the nearest half-hour of service. This fixed price will include use of all necessary cameras or supporting equipment.

4.2.2.5.3.13 DOD Additional Products

Additional engineering products not in the basic launch multi-media package, in addition to institutional products, shall be available upon ordering separately. Additional products in general include, but are not limited to: processing of negative film, color prints of various sizes, digital photographic still products, videotapes, photo CDs, DVDs, and additional motion picture film processing/printing. Labels and/or captions are included in the standard price for all DOD additional products. This list shall also include prices for any standard size of raw stock. The contractor shall maintain a means of accepting payment directly from the DOD customer using standard commercial methods.

These products will be priced per the end product price list at ID/IQ Pricing Schedule, attachment J-6.

4.2.3 Transmission System

The contractor shall provide video, voice and data transmission services and support end-to-end configuration and validation to meet operational and institutional requirements at KSC and the NASA occupied facilities at the CCAFS. The systems associated with these services include:

4.2.3.1 T-Carrier/SONET Multiplexer System

ADDRESS/LOCATION: All Areas of KSC and CCAFS Hangars AE, AO, L, AF, and Building EO.

SUPPORT REQUIREMENT: 16 hours x 5 days/week; Weekend call-in; 24 x 7 during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

The T-Carrier/SONET backbone supports both administrative and operational customers at KSC and CCAFS. The backbone utilizes SONET OC-48, SONET OC-3, and M-13 multiplexers. The system provides OC-12, OC-3, DS-3, and DS-1 connectivity between major facilities at the KSC and CCAFS. The existing Integrated Digital Network Exchange (IDNX) T1 network consists of four nodes to provide DS-0 service.

The T-carrier system consists of fiber optic multiplexers at twenty-one locations at KSC and four locations at CCAFS. Office repeaters are installed at all multiplexer locations to improve signal quality at the multiplexer. Customer Service Unit (CSU)/Data Service Units (DSU) are supplied at customer demarcation points for data conversion for V.35, RS-422 and RS-530 interfaces. The T-carrier system utilizes High-bit-rate Digital Subscriber Line (HDSL) equipment to reach selected customers in some of the outlying areas of KSC.

The SONET system consists of 8 OC-48 multiplexers and 11 OC-3 multiplexers at major facilities at KSC.

Uninterruptible Power Supplies (UPS) or battery back up is required at all M-13 and SONET multiplexer locations.

Alarm monitoring is provided via the Remote Monitor and Alarm System (RMAS). The T-Carrier/SONET management system consists of Simple Network Management Protocol (SNMP) control devices and proprietary control devices.

UNIQUE REQUIREMENTS:

None

FACILITY DESCRIPTION:

All Areas of KSC and CCAFS Hangars AE, L, AF, and Building EO.

4.2.3.2 Asynchronous Transfer Mode (ATM) Transmission System (ATXS)

ADDRESS/LOCATION: KSC Building K6-900 (LCC), Building 1193 (VABR), Building M6-138 (CD&SC), Building M7-360 (SSPF)

SUPPORT REQUIREMENT: 16 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

Operational LAN users require private LANs for monitoring and control of ground systems not connected to the Internet, or needing administrative services. The Asynchronous Transfer Mode (ATM) Transmission System (ATXS) provides this service. The ATXS is a commercial off the shelf, standards based switch network consisting of four 10Gbps Cisco 8600 and four 20Gbps Cisco 8540 MSR backbone switches, two 10Gbps FORE ASX1000 and two 20Gbps Cisco 8540 MSR facility switches and over 70 edge switches consisting of Cisco 2820, 2924, 5500, Light Stream 1010 and FORE ASX200. The ATXS is a meshed connected system integrated with the SONET transmission system to take advantage of the SONET ring physical layer protection. It serves as the KSC Operational data transportation system, integrating separate operational LANs over virtual circuits. These virtual circuits utilize RFC-1483, Classical IP over ATM or direct OC-3c ATM connections.

ATXS network management is accomplished by an in-band, SNMP based platform running Hewlett Packard Open View Network Node Manager software and vendor specific management software. An out-of-band system is utilized to enhance security and maintenance, utilizing point-to-point modems.

UNIQUE REQUIREMENTS:

ATXS is a criticality 1 rated system for potentially causing corruption of data for a single path supporting LCC Shuttle Data Center analysis of Orbital Maneuverability Reactionary System (OMRS) checkout data from the Hypergolic Maintenance Facility (HMF). The criticality is referring to a human decision made for OMRS buyoff or in support of at near-real time launch countdown decisions.

FACILITY DESCRIPTION:

All major facilities in the LC39 Area, Industrial Area and CCAFS Hangar AE.

4.2.3.3 Fiber Optic Systems

ADDRESS/LOCATION: All areas of KSC

SUPPORT REQUIREMENT: 16 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

FUNCTIONAL DESCRIPTION:

The KSC/CCAFS fiber optic systems use both multi-mode and single-mode fibers for system connections. The systems supported include: the wideband fiber optic

transmission system, frequency division data multiplexers, wavelength division multiplexers, the Remote Monitor and Alarm System (RMAS), high data rate transmission equipment (50 Mbps), and the Orbiter S-Band uplink monitor. The Fiber Optic Transmission System transmits RS-170 or NTSC color video signal, an analog signal within a 12-megahertz bandwidth, or asynchronous digital data up to 8 Mb/s No Return Zero-Level (NRZ-L) depending on application. The system provides a balanced 124-ohm or unbalanced 75-ohm electrical interface for the optical transmission of video, analog, or digital data signals over a single fiber. The system processes a 1-volt input signal between 10 Hz and 12 MHz and transmits it optically at either 1300 or 1550 nanometers via Injection Laser Diodes (ILD) or Light Emitting Diodes (LED) to the receive location where the signal is restored to the original electrical input signal. ILD transmitters are used in conjunction with optical dividers to create multipoint circuits. The frequency division data multiplexer can accommodate eight data channels (four channels from 0 to 128 Kbps and four channels from 0 to 512 Kbps). Asynchronous data, either balanced or unbalanced can be transmitted at any data rate using RS-422 voltage levels or a one-volt peak-to-peak variant. The aggregate output of the Multiplexer is transported via the fiber optic wideband transmission system. The Wavelength Division Multiplexer (WDM) equipment doubles the capacity of the existing fiber optics cable plant. WDMs are installed at facilities throughout KSC to enhance the optical fiber's capacity. The WDMs multiplex signals at 1300 and 1500 nm. WDMs are primarily used with the wideband fiber optic transmission system. A 32 x 32 Sigma Electronics analog matrix at the CDSC is used as the KSC off-site routing switch in support of shuttle processing, launch and landing video. The fiber optic wideband transmission system has more than 1300 transmitter/receiver pairs that service more than 35 facilities on KSC and CCAFS. At present, approximately eight facilities are equipped with frequency division data multiplexers. Two full duplex 50-Mbps data links exist between buildings (O&C and OPFs 1 and 2 and between the O&C and OPF-3). The Orbiter S-Band Uplink Monitor transmits a 2GHz analog signal between Pads A and B and the OPFs. The system utilizes single mode lasers and 2X2 optical couplers. Fiber optic transmission for short distances include RS-250-B short haul video, SDI video, and SDTI video. This also includes point-to-point variable rate telemetry circuits on KSC and CCAFS.

UNIQUE REQUIREMENTS:

1550 nm transmission on 50/125um multimode fiber

FACILITY DESCRIPTION:

All areas of KSC

4.2.3.4 Remote Monitoring and Alarm System (RMAS)

ADDRESS/LOCATION: Building M6-138 (CD&SC)

SUPPORT REQUIREMENT: 16 hours x 5 days/week; Weekend call-in
24 hours x 7 days/week during major tests, launch, and landings

The Remote Monitoring and Alarm System (RMAS) consists of hardware and software to monitor the health of the Video Products Group PCO 5000 Fiber Optic video or 12Hz analog transmission equipment located at the Kennedy Space Center. RMAS can monitor any equipment generating discrete contact closures and/or analog voltages. The Sun Microsystems RMAS console uses Hewlett-Packard Open View Network Node Manager to provide the RMAS user interface and reporting mechanism. The RMAS Remote Terminal Unit (RTU) is polled for alarm status utilizing a SNMP proxy agent via a Commercial-Off-The-Shelf Code Activated Switch (CAS). The RTU uses KSC designed hardware and software. The RTU software is written in the C language and is compiled to machine language in order to run on the RTU.

UNIQUE REQUIREMENTS:

None

FACILITY DESCRIPTION:

All areas of KSC

4.2.4 Cable Systems

ADDRESS/LOCATION: All areas of KSC

SUPPORT REQUIREMENT: 16 hours X 5 days/week, Additional support as required by schedule

FUNCTIONAL DESCRIPTION:

The contractor shall provide Cable System services including underground location capabilities, trenching, boring and digging, and support end-to-end configuration and validation to meet operational and institutional requirements at KSC and their interfaces to NASA occupied facilities at the CCAFS.

The contractor shall monitor all construction activities and excavations on KSC. The contractor shall attend the pre-launch excavation reviews. The contractor shall coordinate and monitor the fieldwork for the placement of new underground communications utilities. The contractor shall be trained in use and operation of underground location equipment and above ground survey equipment.

The contractor shall provide Outside Plant services in support of operational and institutional requirements at KSC. These services shall include technical and management expertise for outside plant cable: 19, 22, 24 gauge copper twisted pair, 16 gauge twinax, multimode/singlemode fiber-optic cable and BCDS hard-line coax. Also included are Unique launch pad cabling, unique systems cabling, and hard wired Launch Control Complex (LCC) to Pad vehicle safing cable systems that run from MDF to MDF through the Communications Manholes. The contractor shall be trained and certified for unassisted confined space entry into manholes. The contractor shall supply and operate calibrated air quality test equipment.

The contractor shall provide Outside Plant services in support of operational and institutional requirements at KSC. These services shall include technical and management expertise for the Communications Pathways including communications manhole and conduit systems, Repeaters, CXTs (Cross Connect Terminals), TTCs (Telephone Terminal Cabinets), MDFs (Main Distribution Frames), FOTs (Fiber Optic Terminals) and dedicated Communications cable trays at KSC.

The contractor shall provide Telecom services in support of operational and institutional requirements at KSC. These services shall include technical and management expertise for: facility premise wiring from the Frame to the Customer Face Plate (CFP), Frame cross connects, TTC cross connects, Circuit protectors, circuit design and installation. Contractor shall follow the KSC Telecommunications Premises Distribution System design standard STD-E-0021. New facilities are premise wired by the construction contractor under direction of Architect and Engineer (A&E) following STD-E-0021 using SPECSINTACT sections (16700 section). The contractor shall install all equipment including but not limited to cabling required for interfacing with the new facility premises wiring.

The contractor shall provide data base O&M and production for the Circuit Assignment Management System (CAMS). CAMS is an Oracle-based collection of data base management tools containing information about KSC communication circuits. This information includes all copper Inside and Outside plant, all fiber inside and outside plant, circuit characteristics, equipment and work order histories and status.

The Test Board is the central interface point for KSC copper communications circuits between the North area via the VABR, south area via the south repeater, CCAFS via the Banana River repeater and the industrial area. The contractor shall provide Test Board support at the CDSC during major KSC and CCAFS tests and hazardous operations; 7 day, 24 hour support is required on some tests. Test Board support is also required to support day-to-data telecom activities.

The systems associated with these services include but are not limited to the following: 500,000+ Various gauge copper twisted-pair cables, 1,000+ Various gauge twin-axial cables, 3,000+ Multi-mode and single-mode fiber optic cables, 3000+ Backbone and distribution coaxial cables, 107+ Main Distribution Frame cross connects, 1700+ Telephone Terminal Cabinet cross connects, 550+ Manholes, Handholes and associated conduit systems, 42+ Cathode Protection Rectifiers, 22+ Air Dryers, Main Distribution Frame (MDF) to MDF through the Communications Manhole System, Intermediate Distribution Frames, Launch Complex (LC)-39 pad and systems cables, Launch Control Complex (LCC) to LC-39 Vehicle Safing cables, Repeaters, Cross Connect Terminals, Telephone Terminal Cabinets, Facility cable trays (inside and outside), Main Distribution Frames, Fiber Optic Terminals, Wideband Terminals, Cable Records Management – Circuit Assignment Management System (CAMS), Facility premise wiring, Test Board, Flow Meter Panels, and Frame Lights.

UNIQUE REQUIREMENTS:

Clear Frame and safing cables

FACILITY DESCRIPTION:

All areas of KSC.

4.2.5 Administrative Telephones

The performance period for this section begins December 1, 2004.

The contractor shall provide the Operation, Administration and Maintenance (OA&M) of administrative telephone system in support of all KSC residents. There are approximately 17,500 instruments and/or ports in approximately 275 buildings associated with this service agreement.

The contractor shall provide end-to-end support for adds, moves and changes. A move is defined as de-installation, move and re-installation of system hardware requiring a physical dispatch of a technician or analyst. A virtual move is one that does not require a physical dispatch of a technician or analyst. The service provided and work performed shall be in accordance with Industry (BellCore) standards.

The switch infrastructure and local and long distance trunking will be provided by the government. The contractor shall monitor traffic usage on these trunk groups and notify the government when usage approaches levels of service degradation (P 0.01).

The contractor shall provide operator services processing international calls, collect calls, conference calls, other operator-assisted calls, maintain current directory assistance information, and log information on billable calls. The operators shall provide incoming callers with answers to routine questions not requiring Public Affairs intervention.

The contractor shall employ telephone engineering and operations personnel, adequate to support existing and future requirements, who are proficient in Voice over IP (VoIP) technology, including but not limited to, VoIP phones, associated call managers and gateway systems.

The VoIP systems interface to the KSC Institutional Network and the legacy KSC Administrative Telephone System. The contractor shall support these interfaces and provide all required programming to facilitate connectivity.

The contractor shall operate and maintain the SecureLogix system. The contractor shall review the logs and make recommendations to identified NASA telecommunications personnel and implement changes and rule based policies as directed.

The contractor shall provide current telephone data to support the KSC E911 center on a weekly basis. This data shall include the building, room, occupant/assignee, organization and mail code, and directory number/s for all active ports on KSC. This data, sorted by seat type, shall also be supplied to the COTR on a monthly basis. The contractor shall maintain the E911 switch and it's interfaces with the KSC and CCAFS phone systems.

The contractor shall provide information as requested in support of security, Office of Inspector General (OIG) or managerial investigations. This information may be required on short notice. The contractor shall supply Telephone Call Detail reports as defined in DRD-T-3.

The contractor shall provide a Help Desk for customers to report troubles, obtain information on instrument/system operations, and status on open work.

The contractor shall provide user training to assure customers receive adequate operating information on their type of instrument. The contractor shall supply operating guides which will walk users through routine operations for their instrument type, including frequently asked questions.

4.2.5.1 Phone Seat Description

Each Phone Seat will provide the service required to ensure an appropriate phone instrument and complete phone system is available as specified. This includes instruments, infrastructure, and other required services to provide telephone related connectivity within, and external to, the Center. Also included in this service is the maintenance and administration of the telephone infrastructure; basic services (operational configuration, engineering and maintenance of analog and digital telephone switching system); moves adds, changes; corrective/preventative maintenance of telephone instruments and drops.

4.2.5.1.1 PH1 Phone Description

Functionality: Provides full phone services for a standard hallway or lab phone.

Standard Services:

Service Type	Service Level	Typical Service Characteristic
Instrument	Single	Single line phone
Line Type	Analog	Analog line
Voice Mail	None	No voice mail
Feature Set	Standard	Call forwarding, transfer, forward, camp, etc.
Moves/Adds/Changes	Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Restore to Service	Regular	Restore to service by close of next business day

4.2.5.1.2 PH2 Phone Description

Functionality: Provides full phone services for a standard desktop or lab phone with voicemail. (Nortel 9316CW or equivalent and compatible)

Standard Services:

<u>Service Type</u>	<u>Service Level</u>	<u>Typical Service Characteristic</u>
Instrument	Single	Single line phone with display
Line Type	Analog	Analog line
Voice Mail	Standard	Voice mail
Feature Set	Standard	Call forwarding, transfer, forward, camp, etc.
Moves/Adds/Changes	Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Restore to Service	Regular	Restore to service by close of next business day

4.2.5.1.3 PH3 Phone Description

Functionality: Provides enhanced feature set phone service intended for use in a branch or division office setting (e.g., secretary phone). (Optiset 1200 or equivalent and compatible)

Standard Services:

<u>Service Type</u>	<u>Service Level</u>	<u>Typical Service Characteristic</u>
Instrument	Multi-12	12 line phone with display
Line Type	Digital	Digital ISDN line
Voice Mail	Standard	Voice mail
Feature Set	Enhanced	Standard plus additional features
Moves/Adds/Changes	Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Restore to Service	Regular	Restore to service by close of next business day

4.2.5.1.4 PH4 Phone Description

Functionality: Provides full phone services intended for use in a conference room. This system will have multiple speakers and microphones spaced at intervals for clear reception and transmission.

Standard Services:

<u>Service Type</u>	<u>Service Level</u>	<u>Typical Service Characteristic</u>
Instrument	Single	Single line phone
Line Type	Analog	Analog line
Voice Mail	None	No voice mail
Feature Set	Speaker	Standard features plus speaker
Moves/Adds/Changes	Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Restore to Service	Regular	Restore to service by close of next business day

4.2.5.1.5 PH5 Phone Description

Functionality: Provides full VoIP phone services for a standard desktop or lab phone with voicemail.

Standard Services:

<u>Service Type</u>	<u>Service Level</u>	<u>Typical Service Characteristic</u>
Instrument	Single	Single line phone
Line Type	VoIP	10/100 Ethernet
Voice Mail	Standard	Voice mail
Feature Set	Standard	Call forwarding, transfer, forward, camp, etc.
Moves/Adds/Changes	Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Restore to Service	Regular	Restore to service by close of next business day

4.2.5.1.6 PH6 Phone Description

Functionality: Provides enhanced feature set VoIP phone service intended for use in a branch or division office setting (e.g., secretary phone).

Standard Services:

<u>Service Type</u>	<u>Service Level</u>	<u>Typical Service Characteristic</u>
Instrument	Multi-12	12 line phone with display
Line Type	VoIP	10/100 Ethernet
Voice Mail	Standard	Voice mail
Feature Set	Enhanced	Standard plus additional features
Moves/Adds/Changes	Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Restore to Service	Regular	Restore to service by close of next business day

4.2.5.1.7 PRI Service Description

Functionality: Provides new or additional Primary Rate Interface (PRI) service to devices. (Example: New Video Conferencing Unit)

Standard Services:

<u>Service Type</u>	<u>Service Level</u>	<u>Typical Service Characteristic</u>
Instrument	None	N/A
Trunk Type	Digital	23B + D
Voice Mail	None	None
Feature Set	Enhanced	Enhanced PRI Features
Moves/Adds/Changes	Regular	Moves/adds/changes completed within 5 work days, no field visit 8 hours
Restore to Service	Critical	Restore to service within 2 contiguous hours

4.2.5.2 Phone Service

Service Description: Provides the service to ensure an appropriate phone instrument and complete phone system is available to the specified Phone Type. This includes instruments, infrastructure, and other required services to provide telephone related connectivity within, and external to, the Center. Also included in this service is the maintenance and administration of the telephone infrastructure; basic services (operational configuration, engineering and maintenance of analog and digital telephone switching system); moves, adds, changes; user training; help desk; corrective and preventative maintenance of telephone drops.

4.2.5.2.1 Instrument

Service Description: Provides for the phone instrument type.

Service Levels	Typical Service Characteristic
Single	Single line phone instrument
Dual	Dual line phone instrument
Multi-12	12 line phone instrument
Multi-24	24 line phone instrument

4.2.5.2.2 Line Type

Service Description: Provides for the desired line type.

Service Levels	Typical Service Characteristic
Analog	Analog line
Digital	Digital line
VoIP	10/100 Ethernet port

4.2.5.2.3 Voice Mail

Service Description: Provides the services required for a voice mail system with the following capabilities: recorded announcements, audio and visual indicators of messages awaiting retrieval, forwarding capability, broadcast (voice mail lists), 15 minutes of storage, auto dial voice mail caller, auto reply (send message back to voice mail caller), create, delete, retrieval of messages from any DTMF phone (internal or external to Center). Retrieval of messages external to the Center shall be accessible via a toll-free number provided by the government.

Service Levels	Typical Service Characteristic
None	No voice mail
Standard	Voice mail with above capabilities
Enhanced	Voice mail with 30 minutes of storage

4.2.5.2.4 Feature Set

Service Description: Provides for a standard set of features to be provided with the phone seat

Service Levels	Typical Service Characteristic
Standard	Call forwarding, transfer, forward, intra-Center conferencing, camp, redial, hold, call park, caller ID, call waiting, message waiting
Speaker	Standard features plus speaker phone
Enhanced	Standard features plus speaker phone, call pickup/hunt group, speed call, auto dial, caller ID, call waiting, message waiting

4.2.5.2.5 Moves/Adds/Changes

Service Description: Provides for a standard set of moves/adds/changes on one work order to be provided with the phone seat

Service Levels	Typical Service Characteristic
Regular	<= 5 moves/adds/changes completed within 2 work days, no field visit 8 hours
Enhanced	<= 5 moves/adds/changes completed within 1 work day, no field visit 4 hours

4.2.5.2.6 Restore to Service

Service Description: Provides standard maintenance services including: System diagnostics and troubleshooting; System and component maintenance; Configuration changes, tracking, and documentation. The COTR will have the right to re-prioritize the restore to service requests on a real time basis up to 1% of the total seats per month to accommodate KSC senior level staff.

Service Levels	Typical Service Characteristic
Regular	Restore to service by close of next business day
Critical	Restore to service within 2 contiguous hours

ADDRESS/LOCATION: All areas of KSC

SUPPORT REQUIREMENT: 8 hours X 5 days/week, off hour call-in, Operator service 6:00 am to 6:00pm, Additional support as required by schedule

FUNCTIONAL DESCRIPTION:

The Administrative Phone System is a Siemens EWSD Class 5 Central Office Host Switch (located in M6 138 (CD&SC) Room 128) with Remotes located in the major KSC facilities. The switch has all of the features and functionality of a Class 5 CO including CLASS, SS7 and ISDN. The system has an integrated voice mail system, a conference bridge, a SecureLogix Telephone Firewall and a Multi Port Conferencing Unit for ISDN

Video. The system integrates with an E-911 switch (O&M included in this contract) to provide PSAP (Public Safety Answering Point) services to KSC. The switch provides connectivity to outside KSC through PRI trunking to the local calling area and between NASA Centers and long distance through FTS (Federal Technology Service-GSA). The phone system provides point-to-point links to and from launch critical operations. The majority of KSC phones are single line display type phones with Caller ID speakerphone, voice mail and CLASS features. The next largest users have ISDN multi-line speakerphones with display. There are several PRI (Primary Rate Interface) spans servicing video, RAID and other data requirements.

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION: Throughout KSC

4.2.6 Institutional Computer Networks

The contractor shall provide the design, installation, operations, maintenance and sustaining engineering for the Kennedy Space Center institutional computer Network (KNET). Contractor shall meet customer data delivery requirements for institutional functions at KSC and the NASA occupied facilities at the CCAFS. Institutional requirements include data necessary for day-to-day business (for example email, internet, work control) and process sensitive elements in support of KSC missions and programs. Institutional network KNET delivers data to-and-from desktops, Local Area Network (LAN), Metro Area Network (MAN) and Wide Area Network (WAN). The contractor shall include end-to-end configuration and validation of KNET system equipment and related software.

The contractor shall provide network services per government approved standards and protocols in accordance with NASA Chief Information Officer (CIO) Executive Notices, policies, directives, procedures, guidelines and associated Security standards, including but not limited to, NPG 2810. The contractor shall follow KSC Institutional Network Connectivity Procedure (KDP-KSC-P1444) to provide a consistent customer request process for acquiring network connectivity while ensuring that mandated security requirements for personnel and equipment are satisfied.

The contractor shall install, operate, and maintain network hardware and software in support of administrative and general-purpose computing systems utilizing, but not limited to: Routers, Hubs, Switches, Network Repeaters, Wireless Access Points and DSL LAN extenders. The contractor shall operate and maintain a complete network management system including in-band primary and backup network operations centers and the out-of-band network management system. Contractor shall maintain and upgraded network systems to meet changing industry standards.

The contractor shall provide operations, maintenance and sustaining engineering of network management support infrastructure including but not limited to: Domain Name

Servers (DNS), Dynamic Host Configuration Protocol (DHCP) servers, Policy Based Routing (PBR), Virtual Local Area Networks (V-LANs), network time servers, network operations database servers, network operations web servers, network security services Remote Access Services including Virtual Private Network (VPN)) servers, authentication services Secure Socket Layer based Proxy Gateways and Plain Old Telephone System (POTS), Integrated Services Data Network (ISDN) Dial-up based services, Call Managers and Voice over IP (VoIP).

The contractor shall maintain a database of all IP addresses assigned to KSC and NASA assigned facilities at CCAFS. Database shall include a minimum set of information for each customer including, but not limited to: IP address, customer name, building number, room number, Customer Face Plate (CFP) number; hardware or machine address, operating system, switch and port number. Contractor shall provide online database access to NASA networks personnel and IT managers as required.

The contractor shall continue to upgrade and improve performance for data transmissions to-from MAN and LAN (delivery to customers). The contractor shall provide engineering and sustaining engineering to include, but not limited to, obsolescence replacement and uniform data standard level improvement (i.e. 100 Mbps desktop and 1000 Mbps Ethernet Backbone) to provide customers with ubiquitous data network infrastructure support that improves service levels across KSC and NASA occupied facilities in the CCAFS area.

ADDRESS/LOCATION: All areas of KSC

SUPPORT REQUIREMENT: 16 hours X 5 days/week, Additional support as required by schedule or Mission support

FUNCTIONAL DESCRIPTION:

KNET provides approximately 13,000 network connections. It is estimated that this number will increase to approximately 15,000 over the next 3 to 5 years. KNET currently supports IP based protocols and is controlled using over (30) Routers, (600) Switches and Hubs to provide networking to over 240 buildings and trailers throughout KSC and NASA assigned CCAFS facilities.

The current network consists of 10/100/1000 Mbps Ethernet and associated cable for data transmission to desktop and servers (i.e. email, web, X.500, streaming audio/video, etc.). KNET is built upon and utilizes cabling and capabilities discussed in section 4.2.5 Cable Plant. KNET sustaining engineering efforts include upgrading obsolete 10base2 Ethernet connections with 10/100 Mbps switched Ethernet and Category 5e premises wiring. Several remote locations within KSC, where fiber optic cable is not available, are served by Digital Subscriber Line (DSL) equipment at lower speeds.

KNET uses PBR and VLANs to provide three segmented/logically isolated networks referred to as Private, Public, Open network (three islands) across KSC and NASA occupied facilities at CCAFS. KNET interconnects between its geographically dispersed facilities with its Kennedy Metropolitan Area Network (KMAN) a redundant, primary and secondary, 100/1000 Mbps Ethernet switched backbone.

KNET provides: Domain Name Servers (DNS), Dynamic Host Configuration Protocol (DHCP) servers, Policy Based Routing (PBR), Virtual Local Area Networks (V-LANs), network time servers, network operations database servers, network operations web servers, network security services remote access services including Virtual Private Network (VPN) servers, authentication services Secure Socket Layer based Proxy Gateways, POTS and ISDN Dial-up based services, Call Managers and Voice over IP (VoIP).

KNET's Network Control Center (NCC) operates from a primary location at the Central Instrumentation Facility (CIF) and a backup location at the Operations and Checkout (O&C). Network system management uses software and protocols including but not limited to: HP Openview network management software, 3COM Transcend, Cisco Works and Simple Network Management Protocol (SNMP) to remotely manage and administer network systems. KNET uses premises wiring typically consisting of a minimum of one Customer Faceplate Plate per 100 square feet of area each delivering 3 data Category 5e and one fiber optic multimode cable (future use).

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION: Throughout KSC and CCAFS NASA assigned facilities.

4.2.7 Network IT Security

The contractor shall perform IT Security activities in areas of security scans, incident response, system and log monitoring, security patches and updates, and reporting. The contractor shall support NASA IT Security personnel performing IT Security functions.

The contractor shall provide technical/engineering support to the Agency Network Security Perimeter Configuration Control Board (NSP-CCB) and the Center Network Control Board (NCB).

The contractor shall provide and maintain all required IT Security plans related to the KICS supported communications systems and/or services, per the agency designated formats and guidelines.

The contractor shall meet all approved standards and protocols in accordance with NASA Chief Information Officer (CIO) Executive Notices, policies, procedures and guidelines in addition to those designated specifically by the Kennedy Space Center Office of the CIO and the KSC/NASA communications infrastructure management. The contractor shall meet all approved standards and protocols in accordance with the NASA Procedures and Guidelines, NPG 2810.1, Security of Information Technology.

The contractor shall provide support to the government for operational services for the center network based information technology (IT) security protections and

monitoring/measurement capabilities. The contractor shall provide the first line of network based monitoring and defense of IT resources, as well as provide a common shared IT Security operations capability to support the IT system environments that utilize the center networks as their primary communications transport service.

The contractor shall support the operations, maintenance, system administration, user support, and sustaining engineering of the following: the principal KSC network authentication systems, the KSC strong authentication system, the KSC IT Security/Network documentation databases, the KSC network perimeter access control systems, the KSC and Agency defined intrusion detection/monitoring systems, and all KICS managed systems related to the storage, tracking and auditing of all required Network/IT Security configuration/review/approval documentation processes and data.

The contractor shall implement government approved system rule set/configuration modifications to the network perimeter protection systems, including modifications to the firewall rule sets, editing of router based Access Control Lists (ACLs), and keep an accurate record log of all changes made to the system. The contractor shall retain electronic archival copies of the firewall traffic logs, firewall rule sets and related router/switch configurations.

The contractor shall actively review and validate the logs of management access to the network service delivery infrastructure to verify that only authorized individuals are connecting to these systems. The contractor shall assure that any modifications to the configurations of these devices are performed in accordance with government documented practices. The contractor shall review the log daily and report any unauthorized attempts to access this equipment to the IT Security management personnel for further investigation and resolution.

The contractor shall provide all relevant firewall traffic logs, intrusion detection activity reports, monitoring system data, network authentication system activity logs, strong authentication account activity data, and/or any available network data required to support an IT Security forensics investigation. The contractor shall provide engineering analysis support to aid in the interpretation of all activity log data provided.

The contractor shall maintain a comprehensive IT Security/Network documentation database containing all of the required data fields. The contractor shall ensure that the documentation data stored in this system has been verified to be accurate not less frequently than quarterly by means of the use of automated Scan tools where possible, and by monthly auditing of a randomly selected but statistically significant subset of the entries in the database for closer inspection and validation.

The contractor shall monitor all network traffic crossing the designated center ingress/egress points, as well as the instrumented internal backbone locations using the government defined and provided intrusion detection/monitoring systems. The contractor shall initiate incident response procedures by providing notification to the designated IT

Security personnel when confirmation of suspicious network traffic/protocol behavior is detected.

The contractor shall report any observed suspicious network protocol/traffic behavior for further investigation and/or the initiation of IT Security incident response actions. This will be accomplished using both the designated intrusion detection and monitoring systems, as well as any other contractor supported systems.

The contractor shall support the design, configuration, operation and data reporting of special purpose/function IT Security sensors/systems. These systems are used to detect specific events or to identify and quantify the presence of IT system vulnerabilities.

The contractor shall operate the Remote Authentication Dial In User Services (RADIUS) subsystems. RADIUS subsystems pass network specific authentication requests to the relevant user account/authentication /authorization systems managed by each of the respective IT organizations.

The Contractor shall issue and retrieve hardware tokens related to the KSC strong authentication system as directed by the government. The contractor shall utilize Communication Control to provide user telephone support. The contractor shall provide troubleshooting and problem isolation of functions related to the tokens and the user's system account, and maintain the relevant KSC strong authentication services system utility support subsystems.

The contractor shall perform IT vulnerability scans in accordance with government directives/instructions and at a frequency of at least quarterly, or when requested. The contractor shall provide special purpose IT Security vulnerabilities/assessment scans to identify/isolate a known IT Security vulnerability issue that requires immediate attention.

The contractor shall perform periodic auditing of the current KICS communications systems/architecture configurations with IT Security assessment results and recommendations. The contractor shall identify the corrective action to be taken and any additional resources required to minimize or eliminate the condition resulting in the weakness or problem area/process.

The contractor shall, in conjunction with the government, maintain a call down list process to notify appropriate IT Security personnel. The contractor shall initiate and perform an immediate IT Security incident response upon activation of the IT Security call down list per the instruction of the designated government personnel.

ADDRESS/LOCATION: KSC Building M6-138 (CD&SC), Building M6-39
(PSCN), Building 360 (CIF), Building 60680 Hangar
AE

SUPPORT REQUIREMENT: 16 hours X 5 days/week. Additional support as required by schedule and required support activities. After hour Response to Network events shall be within 1 hour.

FUNCTIONAL DESCRIPTION:

The Network IT Security systems include the following: perimeter access control, intrusion detection/monitoring, and network authentication.

The KSC perimeter access control systems are located at the two major and one minor ingress/egress points to the Kennedy Space Center. They are comprised of COTS firewall appliances running in concert with clustering/high availability solutions and interconnected with multiple routers and switches all performing a fundamentally different function. These systems are the principal means of dividing the center network environment into the major IT security zones and the interfaces to the Wide Area Networks/Internet. These systems are comprised of isolation routers and located at KSC and CCAFS.

The KSC intrusion detection/monitoring systems are a combination of COTS and open source tools based on Agency mandated product sets, KSC standard solutions, and a variety of open source alternatives to supplement these core solutions when necessary. These systems provide distributed multi-purpose and point solutions to meet a wide spectrum of IT Security monitoring/logging requirements. They are primarily co-located at the primary center ingress/egress points with the perimeter access control systems, although a number of the sensors are distributed out to a smaller number of key network traffic transit locations internal to each security zone.

The KSC IT Security analysis capabilities are a series of systems that provide both ongoing IT Security vulnerability scanning/assessment functions to the entire center and post analysis of the data collected by the intrusion detection/monitoring systems including the network infrastructure elements (via Syslog/RADIUS/Netflow data).

The KSC IT Security /IP/ Media Access Control (MAC) address registry database and perimeter access request databases reside on several small server class systems running internally developed databases based on COTS database software. These systems are located primarily in the Network Operations Center area of the CIF building.

The KSC network authentication systems are primarily a series of redundant RADIUS and TACACS+ systems providing both a basic network authentication/account activity logging service and a pass-through authentication function to more complex authentication systems that exist in the external IT organizations at KSC. These network authentication services provide intermediate authentication to a number of the KICS supported network services such as the Secure Remote Access System (VPN), Wireless LANs (both private and open), and the center dial-in services. All of these systems utilize the same basic COTS software for possible future integration.

The KSC strong authentication system is a COTS, two Factor, Hardware Token based authentication system that provides a primary source of account authentication for portions of the network infrastructure elements, several remote network access subsystems (S-RAS and Dial-In), and a number of IT environments/systems. These systems require a higher strength authentication service than can be offered in the traditional IT environments on center. Redundant nodes of this system are adjacent to the

isolation router perimeter WAN ingress/egress points and a number of the center's network infrastructure services systems (such as DNS).

UNIQUE REQUIREMENTS: None

FACILITY DESCRIPTION: Throughout KSC and CCAFS NASA assigned facilities.

5.0 INDEFINITE DELIVERY/INDEFINITE QUANTITY (ID/IQ) CATALOG OF SPECIALIZED SERVICES

The contractor shall participate in NASA-led efforts as described in this section. Types of work in this category include performing studies and analyses of communications system operations alternatives during early project definition, developing new technology for application to communication system operation, providing skills and teaming in support of government-led development projects, providing skills in support of government-led operations activities, and providing quick-reaction analyses and solutions to problems such as special program testing and/or technology demonstration requirements.

Each of the type of effort described in this section shall be initiated, managed, and performed by the contractor as described under individual task order agreements with the government.

5.1 Communication Component Design, Development, Integration, and Operational Support Services

The contractor shall provide resources to support the development of new communication and information technologies that will ultimately lead to significantly reduced operations costs.

The contractor shall provide support in the development of one-of-a-kind or next-generation communications capabilities. They range from development of a communications capability for small local customers to a Center-wide capability. These efforts have aggressive schedules and requirements and entail a high degree of risk. These efforts have significant government involvement in the definition and implementation of requirements.

These are government-led activities with frequent interaction between the government and the contractor.

This work is dynamic in nature and typically performed in a team arrangement with the government. The government defines the overall requirements of the effort and decides the respective responsibilities of each organization participating in the effort. Intermediate and final deliverable items are defined, but the nature of this work requires frequent changes to the baselines.

Future NASA-led development efforts in the area of computer network communications could include efforts to meet new requirements, migrate existing systems, and replace aging systems. Technical areas are expected to include but are not limited to server hardware, application software, communication asset management software, network systems, network hardware, and computer systems.

Future NASA-led development efforts in the areas of transmission, voice, video and still-imaging systems could include efforts to meet new requirements, migrate existing systems, and replace aging systems. Technical areas are expected to include but are not limited to fiber optics, copper, analog, digital, hard-wire, radio and microwave distribution. Also, compression and recording techniques may be addressed.

The contractor shall support the government with operational support for Information Technology and communication asset management in a control room type of environment. This type of effort is associated with the agency-wide OneNASA information technology initiatives that are being activated at the Kennedy Space Center. The type of operational support the contractor shall provide includes but is not limited to system administration, help desk administration, and network management system analysis.

5.2 ID/IQ Types of Services

The contractor shall provide cost for engineering, analysis, operations, and related services to perform design, development and operations of KSC and NASA Information Technology and Infrastructure Network Systems. The contractor shall provide not to exceed pricing for each position identified in the following brief overviews

A) System Administrators:

A System Administrator shall have experience in the configuration, management, administration and support of the assigned systems. These may be messaging systems, server systems, network systems or collaboration systems.

B) Help Desk Services:

Help Desk Services support shall have technology backgrounds and experience in the operational utilization of assigned systems, troubleshooting problems with these systems, and how the assigned systems interoperate with other NASA systems. They must understand the details of the application of the tools and applications assigned. It is expected that there will be junior and senior level Help Desk Personnel.

C) System Engineering Services:

System Engineering support services include performance of overall engineering activities to support information technology enterprise development. These duties include: design, development, sustaining engineering, operations support, troubleshooting, problem resolution and integration of assigned operational systems.

D) Sub-System Engineer Services:

Sub-System Engineer support services include performance of engineering activities on specific subsystems engineering activities to support information technology enterprise development. These duties include: design, development, operational activity support, troubleshooting and problem resolution for assigned sub-systems.

E). Technical Support Services

Technical Support Services include performing activities associated with installation and activation of communication capabilities described in attachment J-1 sections 1.0 and 4.0. These duties include new facility activation, new communication system and sub-system activation, as well as support of information technology integration projects.

6.0 CONTRACT LEVEL INFORMATION TECHNOLOGY (IT)

Section 6.0 addresses all systems associated with the KICS contract including the administrative IT. Additional specific technical requirements for the IT systems are addressed in Section 4.0.

6.1 IT Security

All the IT system(s), including desktop computers, shall comply with Management of Federal Information Resources, OMB Circular A-130; Security of Information Technology, NPG 2810.1; Defining Baseline IT Security Requirements That Have Been Left to Center Discretion, KNPG 2810.1; Vulnerability Disposition, KNPG 2810.2, and any subsequent revisions to the Center's IT policies. Systems retained by the contractor shall be in compliance at contract start date. New systems shall be compliant prior to authorization to support KICS requirements.

The contractor shall protect sensitive unclassified information including Privacy Act information, proprietary data, International Traffic in Arms Regulated data, and export controlled data. The contractor shall protect information in accordance with NPG 2810.1.

6.2 Support IT Hardware and Software

Acquisition and maintenance of the hardware and software not accounted for in the Government Furnished Property List (Attachment J-1, Appendix 5) but used to support the KICS contract shall be the responsibility of the contractor. For example, the contractor is responsible for the systems and software that host configuration management, CAD, office automation, etc.

The contractor shall manage all IT functions in support of contract requirements. The contractor's IT system shall be compatible with the standards called out in Minimum Interoperability, NASA-STD-2804 (with the exception of IFMP compatibility); Minimum Hardware Configurations, NASA-STD-2805; UNIX Interoperability, NASA-STD-2810 and any applicable subsequent revisions to the center's IT policies.

7.0 LOGISTICS

The contractor shall perform logistics functions in support of all communication services provided under this contract.

7.1 Logistics Services

The contractor shall develop, implement and update a KICS Logistics Plan (DRD L-1) to ensure that all resources identified in the PWS are operationally ready to support communication services for Shuttle, DOD, LSPO, ISS programs and center wide institutional and operational activities.

The contractor shall assume the current inventory of all hardware and software as listed in Attachment J-1, Appendix 5. The contractor shall maintain all hardware, software, tools, test equipment, fixtures, and spares per Agency and KSC guidelines, policies and directives described in DRD L-1, as revised, utilizing MAXIMO®. The contractor shall ensure equipment is repaired and returned to stock in a timely manner to ensure no impact to operations due to lack of spare parts.

The contractor shall identify and provide critical spares, bench stock, consumables and associated materials required to meet the requirements of this contract. The contractor shall procure critical spares and bench stock identified through the maintenance planning activity for assigned hardware and systems.

The contractor shall provide receiving and inspection functions including accountability, storage and warehousing support, and receipt and issuance of supplies, materials, and equipment.

The contractor shall purchase goods and services of a program-specific nature necessary to accomplish assigned work on the KICS contract, in accordance with the guidance of the Federal Acquisition Regulations (FAR), and the NASA FAR Supplement (NFS). Program purchasing is defined as support to projects and other program activities associated with the KICS communications services.

7.2 Material Management

The contractor shall provide a material management capability in support of communication activities. The contractor shall include the following functions:

- Perform material requirements planning for Mod-kits requested by NASA and customers.

- The contractor shall store the Mod-Kits in a secure area until required by the customer.

7.3 Property Management

The contractor shall provide property management of Government Furnished Property (GFP) as identified in Attachment J-1, Appendix 5.

The contractor shall receive, tag, inspect, control, record, store, issue, track, and return or excess all government furnished property. The contractor shall report on the location and condition of the assets when requested by the government and asset owner.

The contractor shall utilize the existing property tags permanently affixed to all existing assets. New tags shall be permanently affixed to newly acquired or procured equipment. Upon validating equipment received from the predecessor contractor, the contractor shall permanently affix an identification label over the predecessor logo.

The contractor shall identify excess and obsolete out-of-service assets, and initiate disposal per Agency and KSC guidelines, policies and directives described in DRD-L1, as revised. Perform all aspects of the excess function to include, but not limited to preparation of all required documentation, in-check, locate, store, and screen.

The contractor shall develop and implement an Equipment Loss Rate Plan see DRD-L-2 to include equipment surveyed, items lost during the fiscal year, found on station, and any reinstated equipment.

7.4 Inventory Management

The contractor shall provide an Inventory Management System (IMS), utilizing MAXIMO®, for the tracking of and management of equipment, spares, repair parts, supplies, and material. The contractor shall provide maintenance planning and the required research, analysis and documentation to determine the minimum initial spares, materials and repair parts required to support this contract. The contractor shall report on the quantity, location and condition of the assets when requested by the government.

The contractor shall utilize and affix identification labels per Agency and KSC guidelines, policies and directives, including revisions, described in DRD-L1.

The contractor shall review NASA, government, and industry alerts such as GIDEP per KHB 5310.1, Reliability, Maintainability, and Quality Assurance Handbook. The contractor shall identify the affected hardware within the contractor's responsibility including off-site vendors and depots, perform an analysis of the problem, provide recommendations and corrective actions to the government, implement corrective actions if required and notify the government of corrective actions taken.

7.5 Warehouse Storage Management

The contractor shall utilize government provided storage facilities for storage of all hardware, software and other associated equipment to meet the requirements of this contract. The contractor shall store all hardware, software and other associated equipment in accordance with manufacturer's storage specifications and recommendations that meets Agency and KSC guidelines, policies and directives described in DRD-L1, as revised. The contractor shall report on the location and condition of the assets when requested by the government and asset owners.

7.6 Transportation Services

The contractor shall:

- Provide transportation services to meet scheduled and unscheduled operations to include the following functions: freight receiving service including inspection of all over, short and damaged shipments.
- Prepare appropriate documentation for outbound shipments: e.g., Request for Shipping Document, KSC Form 7-248, Vendor Supplied Air bill/tag means of transportation, (i.e., FedEx air bill, Airborne prepaid label, or UPS ARS tag).
- Provide packing, crating and handling of supplies, materials, and equipment.
- Provide cargo pick-up and delivery between facilities. JBOSC or its successor will allow off loading at a JBOSC location for heavy or bulky loads (i.e., large cable reels).
- Provide transportation support of electronic and other equipment for calibration
- Perform Non-Bulk combination packaging tests, including drop test, stacking test, and vibration standard test.
- Provide security escort for non-routine, non-badged, Transportation Service Providers (TSP) from the guarded gates to KICS receiving. Transportation Service Providers with deliveries to multiple contractors on center shall formally transfer escort responsibility to subsequent contractors' receiving personnel.
- Treat effluent pumped from shallow groundwater contaminated designated manholes and/or connected duct banks, for operations and maintenance purposes, in accordance with the KSC Dewatering Policy and subsequent revisions. To comply with KSC environmental requirements, the contractor shall be responsible

for pumping water out of the contaminated manholes into a NASA-owned, JBOSC operated trailer mounted scrubber unit, which removes volatile organic contaminants.

7.7 Calibration Services

The contractor shall provide all calibration services. The calibration of test equipment shall include cleaning surfaces incidental to the calibration effort, analyzing particulates and hydrocarbons on surfaces exposed to fluid media, and making equipment repairs.

The contractor shall provide calibration services that meet Agency and KSC guidelines, policies and directives described in DRD-L1, as revised.

7.8 Confined Space Work Areas

Special requirements, coordination, and precautions shall apply to any contract work to be performed in confined spaces. The contractor preparing to perform work in a confined space is required to provide a written program for such work as part of their Safety and Health Plan, which will be consistent with the requirements of 29 CFR 1910.146. For work in telecommunication manholes, provisions of 29 CFR 1910.268(o) also apply. The contractor shall coordinate any such work in confined spaces with JBOSC Environmental Health, Fire Services and any other resident government or contractor organization whose employees may have access to the designated work location. Entry into and work in confined spaces shall be in accordance with the requirements of KHB 1820.4, "KSC Respiratory Protection Program", KNPG 1840.19 "Industrial Hygiene Programs", and all other applicable clauses of this contract.

Confined spaces, which contain water, shall have the water pumped out by the contractor prior to scheduling or performing a confined space entry check.

8.0 TRAINING AND CERTIFICATION OF PERSONNEL

The contractor shall plan, implement, and manage training and certification as described in this section and Attachment J-1, Section 2.3.6.

8.1 Training and Certification Plan

The contractor shall develop, implement, and maintain a Training and Certification Plan (DRD TR-1). The plan shall define how the contractor will ensure that all personnel performing work under this contract, including any subcontracts, are experienced and knowledgeable and meet training and certification requirements to perform assigned work as technology, equipment and software evolve. The contractor shall develop and implement this training and certification plan in compliance with KHB 3410.1, Implementing Instructions for KSC Systems, Safety, and Skills Training, and for Certification of Personnel, and KHB 1710.2, Kennedy Space Center Safety Practices Handbook, as the handbooks are revised, NPG 2810.1, Security of Information Technology, as revised, KHB 5310.1, Safety, Health and Independent Assessment Reliability, Maintainability, and Quality Assurance Handbook, as revised, and KHB 1610.1, KSC Security Handbook, as revised.

The contractor shall submit the Training and Certification Plan for approval as per DRD TR-1.

8.2 Regulatory Requirements

The contractor shall ensure and verify that all contractor and subcontractor personnel are knowledgeable of the laws, regulations, and government directives (e.g. OSHA, EPA, and Export Control Regulations, Agency policy and guidance, KSC directives) affecting them and concerning their tasks. Contractor personnel who engage in performing critical tasks, control critical processes, or engage in hazardous operations shall be trained and certified to participate in those activities. See Section 3.0 of this Performance Work Statement for additional information about regulatory requirements.

8.3 Safety and Health

The contractor shall ensure that all contractor and subcontractor personnel are knowledgeable about Agency and KSC safety and health initiatives, including the Voluntary Protection Program (VPP). See Section 3.0 of this Performance Work Statement for additional detail.

The Training and Certification Plan shall address safety and area access related training, including maximum work time requirements, described in KHB 1710.2.

8.4 Access to Restricted Work Areas

The contractor shall ensure that contractor personnel who require access to controlled work areas complete all required training and that badge requirements, including Personal Reliability Program (PRP) requirements (KHB 1610.1), are met as they are revised. The

contractor shall ensure that contractor personnel renew area access training as required to maintain access to restricted areas where work must be performed. The current list of KSC Operational Area Access Safety Training Requirements and KSC Operational Area Access Safety Training Matrix are shown in Figure 8-1 and Figure 8-2 respectively.

The contractor shall ensure that personnel required to perform work in DoD controlled work areas complete all required training and badge requirements as they are revised, and accomplish renewals as needed to maintain continuity of support in those areas.

KSC OPERATIONAL AREA ACCESS SAFETY TRAINING REQUIREMENTS				
August 2002				
	Facility	Course Number	Course Title	Expiration
Industrial Area	Industrial Area	QF28XKSC	Industrial Area Familiarization	3 Years
	Hangar AF	QF04AKSC	Hangar AF Familiarization	3 Years
	HMF	QF28HKSC	HMF Familiarization	3 Years
	LETF	QF28LKSC	LETF Familiarization	3 Years
	MILA	QF28DKSC	Data Network Station	3 Years
	MPPF	QF28MKSC	MPPF Familiarization	3 Years
	O&C	QF28OKSC	O&C Building Familiarization	3 Years
	PHSF	QF28PKSC	PHSF Familiarization	3 Years
	SAEF-2	QF28SKSC	SAEF-2 Familiarization	3 Years
	SSPF	QF28IKSC	SSPF Familiarization	3 Years
	SSPF	QG223KSC	SSPF Ammonia Familiarization	None
VPF	QF28VKSC	VPF Familiarization	3 Years	
LC-39 Area	LC-39 Area	QF39XKSC	LC-39 Familiarization	3 Years
	MLP	QF39MKSC	MLP Familiarization	3 Years
	OPF	QF39OKSC	OPF Familiarization	3 Years
	PAD	QF39PKSC	PAD Familiarization	3 Years
	RPSF	QF39RKSC	RPSF Familiarization	3 Years
	SLF	QF39LKSC	SLF Familiarization	3 Years
	VAB	QF39VKSC	VAB Familiarization	3 Years
Other	ELSA	QG07CKSC	ELSA Training	1 Year
	Flight Vehicle	QG150KSC	Flight Vehicle Safety	None
	General Safety	QG109KSC	General Processing Safety	3 Years
	Propellants Storage	QF200KSC	Liquid Propellants Storage Fam.	3 Years

Figure 8-1

KSC OPERATIONAL AREA ACCESS SAFETY TRAINING MATRIX

No.	Operational Area	Course Requirements					
1	VAB Perimeter	QG07CKSC	QG109KSC	AND	QF39VKSC	OR	QF39XKSC
2	VAB High Bays 1/ 3	QG07CKSC	QG109KSC	AND	QF39VKSC	OR	QF39XKSC
3	VAB High Bays 2/ 4	QG07CKSC	QG109KSC	AND	QF39VKSC	OR	QF39XKSC
4	VAB ET Work Stands	QG07CKSC	QG109KSC	AND	QF39VKSC	OR	QF39XKSC
6	VAB Shuttle Engine Maintenance	QG07CKSC	QG109KSC	AND	QF39VKSC	OR	QF39XKSC
10	PAD-A Perimeter	QG07CKSC	QG109KSC	AND	QF39PKSC	OR	QF39XKSC
11	PAD-A FSS/ RSS	QG07CKSC	QG109KSC	AND	QF39PKSC	OR	QF39XKSC
12	PAD-A PCR	QG07CKSC	QG109KSC	AND	QF39PKSC	OR	QF39XKSC
15	PAD-B Perimeter	QG07CKSC	QG109KSC	AND	QF39PKSC	OR	QF39XKSC
16	PAD-B FSS/ RSS	QG07CKSC	QG109KSC	AND	QF39PKSC	OR	QF39XKSC
17	PAD-B PCR	QG07CKSC	QG109KSC	AND	QF39PKSC	OR	QF39XKSC
20	OPF Perimeter	QG07CKSC	QG109KSC	AND	QF39OKSC	OR	QF39XKSC
21	OPF Bay 1	QG07CKSC	QG109KSC	AND	QF39OKSC	OR	QF39XKSC
22	OPF Bay 2	QG07CKSC	QG109KSC	AND	QF39OKSC	OR	QF39XKSC
23	OPF Bay 3 (Perm)	QG07CKSC	QG109KSC	AND	QF39OKSC	OR	QF39XKSC
24	OPF Bay 3	QG07CKSC	QG109KSC	AND	QF39OKSC	OR	QF39XKSC
25	RPSF	QG07CKSC	QG109KSC	AND	QF39RKSC	OR	QF39XKSC
26	PHSF	QG07CKSC	QG109KSC	AND	QF28PKSC	OR	QF28XKSC
27	SLF	QG07CKSC	QG109KSC	AND	QF39LKSC	OR	QF39XKSC
28	Mate/Demate Device	QG07CKSC	QG109KSC	AND	QF39LKSC	OR	QF39XKSC
31	LCC FR 1/ 2/ 3/ 4	NONE					
33	LCC CCC	NONE					
34	LCC CDS	NONE					
35	LCC LPS	NONE					
36	MILA Tracking (S-Band)		QG109KSC	AND	QF28DKSC	OR	QF28XKSC
38	Crawler Transporter	QG07CKSC	QG109KSC				
39	MLP	QG07CKSC	QG109KSC	AND	QF39MKSC	OR	QF39XKSC
40	O & C Assembly Test Area	QG07CKSC	QG109KSC	AND	QF28OKSC	OR	QF28XKSC
41	Parachute Facility	QG07CKSC	QG109KSC	AND	QF28LKSC	OR	QF28XKSC
42	LETF	QG07CKSC	QG109KSC	AND	QF28LKSC	OR	QF28XKSC
43	VPF	QG07CKSC	QG109KSC	AND	QF28VKSC	OR	QF28XKSC
44	SAEF - 2	QG07CKSC	QG109KSC	AND	QF28SKSC	OR	QF28XKSC
45	HMF	QG07CKSC	QG109KSC	AND	QF28HKSC	OR	QF28XKSC
46	MPPF		QG109KSC	AND	QF28MKSC	OR	QF28XKSC
47	SSPF CL WK AR/HB-SITE CCMS	QG07CKSC	QG109KSC	AND	QF28IKSC	OR	QF28XKSC
48	SSPF Food Processing Area		QG109KSC	AND	QF28IKSC	OR	QF28XKSC
49	SSPF Resupply & Retention Area	QG07CKSC	QG109KSC	AND	QF28IKSC	OR	QF28XKSC
54	SRB Disassembly (Hangar AF)	QG07CKSC	QG109KSC	AND	QF04AKSC		
56	Hangar AE Clean Room		QG109KSC				
59	Hangar S Clean Room		QG109KSC				
60	Fuel Storage Area # 1	QG07CKSC	QG109KSC	AND	QF200KSC		
70	Orbiter	QG07CKSC	QG109KSC	AND	QG150KSC		
71	ET	QG07CKSC	QG109KSC	AND	QG150KSC		
72	SRB	QG07CKSC	QG109KSC	AND	QG150KSC		
73	Payload		QG109KSC				
74	Flight Crew Equipment		QG109KSC				
88	LCC Room 1P10	NONE					

Figure 8-2

8.5 Special Skills Certification

The contractor shall ensure that all contractor and subcontractor personnel who perform tasks requiring special skills certification complete the appropriate training and meet any certification requirements. The contractor shall ensure that contractor personnel are re-certified when required. The Training and Certification Plan shall identify the special skills to be used by the contractor and define how the contractor will ensure that training and certification are accomplished and maintained.

The Training and Certification Plan shall include, for each unique position identified in the staffing plan, a list of training and certification requirements for the position. This includes positions filled by subcontractors, and teaming or partner arrangements. The Training and Certification Plan shall define how training and certification requirements will be identified, documented, approved, and met for any positions not addressed in the staffing plan, such as short notice ID/IQ tasks that require special skills or certifications that occur between revisions of the staffing and training and certification plans.

8.6 Systems Training and On-the-Job Training (OJT)

The contractor shall ensure that contractor personnel performing work under this contract, and any subcontract, are competent and possess the necessary skills and knowledge about the systems, equipment, software, and tasks they are assigned to support. The Training and Certification Plan shall identify systems training needed to ensure the work force is competent to perform assigned tasks as technology, equipment, and software evolve.

Any OJT program shall be clearly defined in the Training and Certification Plan and ensure that competent, trained and knowledgeable personnel oversee such training.

8.7 Information Technology Security Training

The contractor shall ensure that all contractor and subcontractor personnel meet IT security-training requirements that apply to the performance of assigned work. Different levels of training will be required for employees charged with different levels of access to IT systems, as required by NPG 2810.1.

The Training and Certification Plan shall include the use of NASA SOLAR online IT security training, or provide equivalent training that is approved by the NASA-KSC Chief Information Officer (CIO).

8.8 Historical Records

The contractor shall maintain historical records to document the training and certification of contractor personnel, and of all training conducted by the contractor.

The contractor shall enter and update training data in the KSC Training and Certification Record System (TCRS) PM50 for all personnel trained by the contractor.

The contractor shall ensure that subcontractors maintain historical records to document training and certification of subcontractor personnel, and that subcontractor training is recorded in the TCRS.

The contractor shall maintain each employee's training records for at least three years after that employee's employment ends. The contractor shall provide contractor and subcontractor training records to the government upon request.

The contractor shall transition the training records, of personnel retained from the predecessor contractor, and incorporate them into the contractor's records. The contractor shall also define in the Training and Certification Plan how the contractor will transition KICS training records to any successor contractor.

8.9 Reporting and Status of Training and Certification

The contractor shall report the status of training and certification to the government as required in KHB 3410.1 and KHB 1710.2, as they are revised.

The contractor shall provide the status of training and certification at operational reviews and other meetings as directed by the government, to report readiness to support planned operations. See Sections 2.3.3 and 2.3.4 of this Performance Work Statement for specific information.

8.10 Use of Existing Training Resources

The contractor shall use existing government-funded training resources when available. This includes the use of training provided by other contractors employed by KSC, such as, but not limited to, area access, Emergency Life Support Apparatus (ELSA), and IT security training.

A list of government-funded, contractor-provided training to meet NASA KSC/CCAFS work requirements is shown in Figure 8-3. A list of government-funded, contractor provided training to meet DoD/CCAFS work requirements is shown in Figure 8-4.

8.11 Government and KSC Contractor Access to KICS Training

For KICS developed or provided training, the contractor shall provide the government access to their training schedule. The contractor shall permit attendance by government personnel and government customers in any scheduled training, on a space-available basis. KICS developed training shall be, at least, recorded in digital format.

USA Course #	J-BOSC Course #	Training Course Titles
QG301LSC		Confined Space Entry/Entrant & Attendant
QG301LSC		Confined Space/Supervisor
QG247LSC		Personal Protective Equipment Awareness
	QG227KSC	Fire in the Workplace (VIDEO)
	QG225KSC	First Aid/Fire Suppression
	XG155KSC	Hearing Conservation
QG277USA		Lead Worker Training Program
	QG227JBO	OSHA Cadmium Standard
QG232USA		Forklift Safety Familiarization
QG232USA		Forklift Safety Familiarization (Refresher)
	QG234JBO	Aerial Lift Safety Familiarization
	QG235JBO	Aerial Lift Safety Familiarization (Refresher)
QG245/145USA		Fall Protection Safety
QG116USA		Lockout/Tagout, Control of Haz. Energy (Authorized)
QG118USA		Lockout/Tagout Haz. Energy (Affected)
	QG115KSC	KSC Wide Asbestos Awareness
QG204USA		High Pressure Gas Safety
	QG251JBO	Construction/Maintenance Asbestos Awareness for Class IV Ops
	QG524JBO	Asbestos Class III-IV Competent Person
	QG226KSC	Two Way Radio & OIS Familiarization
QG304KSC		CPR (Cardio Pulmonary Resuscitation)
QG310KSC		CPR and First Aid
QG313KSC		CPR/Basic First Aid Recertification
EG201USA		Electrostatic Discharge Familiarization
QG07CKSC		ELSA Training
QS200LSK		Pad/Red Crew Contingency Crew Familiarization
	QG220JBO	Supervisor Respiratory Awareness
QG360USA		Selection, Use, Care, & Maint. Resp. Equip.
QG361USA		Selection, Use, Care, & Maint. Resp. Equip. (Refresher)
QG381USA		Respirator Fit Test
	QG212KSC	EPA (RCRA) Hazardous/Toxic Waste Mgt. (Continuing Training) Adv.
	QG299KSC	EPA (RCRA) Universal Waste Rule
	QG368KSC	EPA (RCRA) Hazardous/Toxic Waste Mgt. (Intermediate)
	QG386KSC	Stormwater Pollution Prevention
QG511LSK		Atmospheric Testing
QS210LSK		FOD Prevention
EG500LSK		MDF Terminal Soldering
ES501LSK		Wire Termination
ES502LSK		NASA Soldering or Limited Soldering
ES504LSK		Potting of Electrical Connectors
ES508LSK		Solderless Wire Wrap
ES509LSK		Fiber Optic Connectorization
Area Access Familiarization Training		
On-line - CBT		Hangar AF Familiarization
On-line - CBT		Industrial Area Safety Familiarization
On-line - CBT		SLF-OPF-PAD-RPSF-VAB Familiarization
On-line - CBT		General Processing Safety
On-line - CBT		Space Shuttle Safety
	XG225KSC	Clean Room Entry
	QG223KSC	Anhydrous Ammonia Hazard Awareness

**Figure 8-3:
Training Matrix**

