



ATTACHMENT J-10

Sample Task Order (STO) #2 – ENVIRONMENTAL DATA NETWORK

1.0 Introduction

The Environmental Assessment Agency (EAA) recently signed Memorandum of Agreements (MOAs) with several South American countries for the purpose of collecting environmental and weather data from remote outposts to better support environmental trend analysis. The EAA requires a satellite-based communication network to backhaul data from remote sensor outposts that are installed in each country.

2.0 Objective

The Contractor shall design, deploy, and sustain a satellite-based network to support data collection from sensors in remote locations within South America. The EAA will provide security for all equipment installed at each of the remote sites (e.g., fencing and motion-activated surveillance cameras). Each of the sites has a 20 x 20 feet concrete pad enclosed by 6 foot high security fencing. The Contractor will select the best technology and band for this solution.

The suites of sensors and motion-activated surveillance cameras currently installed by the EAA at each remote site will share power with the satellite terminal. The Contractor will need to provide solar power (to include battery back-up) for all equipment installed by the Contractor at four of the six remote sites including the remote sensors power over Ethernet (PoE). The daily duty cycle for the terminal transmitting will be approximately 5 min per day to transmit captured environmental and weather data. Each sensor and terminal will be programmed to communicate at different times at each location. This will minimize total system bandwidth needed and also take advantage of saving battery power for solar operation.

The estimated data transferred per day will be approximately 5 Megabytes (MB) per site. This 5 MB figure would include occasional agency personal use, sensor data collected, and possible motion-activated surveillance camera activity. The network must also provide a capability to share the remote sensor bandwidth and motion-activated surveillance camera bandwidth with occasional personnel operational needs. The remote sites are typically unmanned, but there will be short periods where EAA will send staff to sites to perform additional data collection or local maintenance for the sensors. The estimated usage profile for these agency personnel is not expected to exceed 3 hours per day, 5 days per year for each site. No additional bandwidth is required for personnel usage.



3.0 Summary of Requirements

The Contractor shall propose a solution compliant with all sample task order requirements that delivers the required quality of service and availability and articulates rationale for the choice of architecture and components, including life cycle cost considerations.

Services and equipment to be provided include:

- Central satellite gateway(s) - Contractor defined location(s) with connection to the Internet
- Satellite connectivity to the remote sensor site
- Solar Power (to include battery back-up) for all equipment installed by the Contractor at four of the sites (there is AC (110 or 220 VAC) power installed at two of the sites: Puerto Williams, Chile and Ventiocho de Novembre, Argentina).
- Three (3) Category 5e Ethernet connections to the satellite terminal (Sensor, Remote User, and motion-activated surveillance camera)
- The Contractor terminal system is required to provide PoE +5V / 250 mA or PoE IEEE 802.3af for the Government Furnished Equipment (GFE) sensor system and motion-activated surveillance camera installed at each location.
- Static private IP addresses for each site accessible through a Virtual Private Network (VPN).
- System Design
- System Documentation
- Managed Network Services
- Engineering Planning
- Installation and Sustainment Planning
 - Installation
 - Integration & Testing
 - Integrated Logistics Support
 - Operations & Maintenance

3.1 Management Requirements

3.1.1 The Contractor shall provide a detailed project schedule (e.g., Microsoft Project or equivalent) in PDF format for the entire Task Order lifecycle.

3.1.2 The Contractor shall discuss:

- 3.1.2.1 The roles and responsibilities of the Contractor and Subcontractors that will contribute to the solution, how work will be partitioned among subcontractors (if applicable), and how subcontractors will be managed.



- 3.1.2.2 Identification and assessment of the Personnel Travel, Environmental, and Safety Hazards for each remote site.
- 3.1.2.3 Establishment of U.S. Government access to a web portal to present the health of the entire solution in a consolidated view.
- 3.1.2.4 Program management approach, procedures, and performance metrics and provide an explanation of how they will be used to ensure timely system development, installation and operation.
- 3.1.2.5 Process and procedures they will employ for coordination with external offices and agencies, EAA Operations Centers, and other communications planners, managers and operators.
- 3.1.2.6 Identification and assessment of risks and a mitigation strategy that minimizes cost, schedule, and performance risk.
- 3.1.2.7 Process and procedures they will employ to develop and furnish the deliverables in Section 7.2.
- 3.1.2.8 Identification of all equipment, on a per-country basis, that are on either the International Traffic in Arms Regulations (ITAR) or Department of Commerce export control lists and provides a plan to manage the equipment in compliance with all applicable regulations.

3.2 Technical Requirements

3.2.1 System Engineering

- 3.2.1.1 The Contractor shall develop and document a solution compliant with all sample task order requirements that delivers the required quality of service and availability and articulates rationale for the choice of architecture and components, including life cycle cost considerations. The Contractor shall discuss how lessons learned from previous projects were incorporated. The Contractor shall provide a high-level network architecture diagram showing nodes and gateway locations. The Contractor shall provide coverage maps for Fixed Satellite Service (FSS) or Mobile Satellite Service (MSS) based solutions; additionally, link budgets for each remote location are required for FSS based solutions. The Contractor shall define and provide the enclosure or shelter power and network interface connections that will withstand environmental rigors at each site.



- 3.2.1.2 The Contractor shall clearly explain their recommendation for bandwidth, stating assumptions, to ensure that only the necessary amount of bandwidth is leased. The Contractor shall implement configuration management, prepare engineering documents and reference manuals, and provide engineering and testing services for the Environmental Data Network.
 - 3.2.1.3 The Contractor shall identify valid installation challenges and risks (excluding any items provided as (GFE), and provide realistic mitigation for each.
 - 3.2.1.4 The Contractor shall discuss how their system incorporates reliability, availability, maintainability, security, network monitoring and interoperability.
 - 3.2.1.5 The Contractor shall address system flexibility and optimization, accommodating potential future needs to support either new sites or higher per-site data transfer needs or spectral optimization to minimize bandwidth needs.
 - 3.2.1.6 The Contractor shall address the power requirements for the following sites: Potosi, Bolivia; Manaus, Brazil; Ciudad Bolivar, Venezuela; La Rinconada, Peru. The Contractor shall provide a solar power source for each of the four sites that include battery back-up. The solar power source shall provide power to all Contractor provided equipment and provide PoE +5V / 250 mA or PoE IEEE 802.3af for the Government Furnished Equipment (GFE) sensor system and motion-activated surveillance camera installed at each location.
 - 3.2.1.7 The Contractor shall include battery back-up for the two locations that have commercial AC power (Puerto Williams, Chile and Ventiocho de Noviembre, Argentina) and do not require any solar power.
- 3.2.2 Satellite Communications Terminals



- 3.2.2.1 The Contractor shall procure, integrate, and deploy environmentally protected enclosure (cabinet or shelter) to each remote site that will house any satellite communications terminal and ancillary equipment that requires environmental protection. Each enclosure shall be designed to withstand the environmental rigors specific to each site with a minimum rating of the exposed components at Ingress Protection (IP) 65 or equivalent. The enclosure is only required to be large enough to support the satellite communications terminal and ancillary equipment requiring environmental protection provided by the Contractor. Sizing will be Contractor defined based on the solution or equipment selected.
- 3.2.2.2 The Contractor shall ensure that all components are interoperable. The Contractor shall connect the GFE sensor and GFE motion-activated surveillance cameras Ethernet connections to their equipment and verify operation at each site. These Ethernet connections will be located within the enclosure or shelter and should not have access from the outside environment.
- 3.2.2.3 The Contractor shall explain how the solution proposed meets the Government’s Committed Information Rate (CIR) requirements. The remote Satellite Terminal locations and the summary of data transport requirements, to include bandwidth sharing for occasional personnel operational needs, are provided for each site in Table 1 below.
- 3.2.2.4 The Contractor shall provide Original Equipment Manufacturer (OEM) Terminal/Equipment Technical Specifications (e.g. datasheets) for all proposed terminal equipment.

Table 1. Summary of Data Transport Requirements

Remote Site ID	Remote Site Locations	Committed Information Rate (CIR) Requirements
Site 1	Puerto Williams, Chile	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 2	Ventiocho de Novembre, Argentina	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 3	Potosi, Bolivia	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 4	Manaus, Brazil	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)



Site 5	Ciudad Bolivar, Venezuela	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
Site 6	La Rinconada, Peru	IP-based transport to backhaul data from sensors to the central collection point (440 kbps inbound, 440 kbps outbound)
All Sites		The network must also provide a capability to share the remote sensor bandwidth with occasional personnel operational needs. Agency personnel will arrive to the sites with a laptop and require internet service connectivity throughput up to 440 kbps outbound and up to 440 kbps inbound. The CIR rate will not increase when agency personnel travel to the remote sites.
Inbound - Data transmitted by the satellite terminal to the Gateway		
Outbound - Data transmitted by the Gateway to the satellite terminal		
Note: The network CIR is 440 kbps inbound, 440 kbps outbound		

3.2.3 Managed Network Services

- 3.2.3.1 The Contractor shall provide turnkey satellite transmission capability that includes all necessary software, hardware, service, and maintenance support to all locations. The Contractor shall be fully responsible for assuring operational availability of the system.
- 3.2.3.2 The managed network services shall include space segment, teleport, and terrestrial components as necessary to ensure a complete end-to-end communications solution between the sensor systems and the Internet. All equipment delivered as part of the complex satellite solution shall be new equipment.
- 3.2.3.3 Central satellite gateway(s) - Contractor defined location(s) with connection to the Internet. Provide all internet access through a U.S. based internet Point of Presence.
- 3.2.3.4 Space segment coverage shall include all sites in South America. FSS solutions require the Contractor to provide maps with clearly depicted and labeled contour lines, demonstrating coverage across the required locations. Contour lines should clearly demonstrate satellite gain to noise temperature ratio (G/T), effective isotropic radiated power (EIRP).
- 3.2.3.5 The Contractor shall meet or exceed a 99.5% link availability for all required satellite links to and from each remote site.



- 3.2.3.6 The Contractor shall provide a high-level network architecture diagram showing nodes and gateway locations with the technical proposal. The Contractor shall provide detailed network configuration documentation, and transmission plans (post award deliverables).
- 3.2.3.7 The Contractor will be required to meet Federal and DoD Information Assurance requirements for a Moderate Impact Information System. The Contractor's information assurance boundary is where the Contractor's services connect to the user terminals/equipment, satellite(s) employed, and systems used in the Satellite Operations Centers (SOCs), Network Operations Centers (NOCs), and teleport.

3.2.4 Testing and Installation

- 3.2.4.1 The Contractor shall develop a testing and installation plan and schedule for the system and provide it to the Government for review/approval no later than 30 calendar days after award. The Contractor shall provide a completed test and installation report to the Government within fourteen (14) calendar days of installation completion. This is a post-award deliverable. See Section L.22.2 regarding submission of post-award contract deliverables.
- 3.2.4.2 The Contractor will be provided with a sensor system and motion-activated surveillance camera for testing at the Contractor's facility prior to the shipment of equipment to South America. The Government understands that there may be some differences in the test configuration due to satellite coverage and teleport location limitations, but the test equipment configuration and network architecture should mirror the proposed network architecture as much as practical.
- 3.2.4.3 The Contractor shall demonstrate Ethernet connection to the internet and verify link stability and data transfer (i.e. Availability and CIR). After link status has been verified the Contractor shall connect the GFE sensor and camera Ethernet connections to their equipment and verify operational testing.
- 3.2.4.4 A subject matter expert (SME) from the EAA will be available to attend testing at the Contractor's facility. The SME will provide any assistance required to make configuration changes to the sensor and surveillance systems. Additionally, the SME will have the authority to validate the test results.



- 3.2.4.5 The Government will provide a SME from the EAA to accompany the Contractor's installer(s) at each of the remote locations based off of the proposed installation schedule. Up to two (2) SMEs are available if the Contractor proposes to perform installations simultaneously. The Government will make every attempt possible to synchronize the SME's travel arrangements with the Contractor's installer(s).
- 3.2.4.6 The Contractor shall ensure that all equipment installed at the remote locations is securely installed, shielded, grounded and labeled. The Contractor shall demonstrate Ethernet connection to the internet and verify link stability and data transfer (i.e. Availability and CIR). After link status has been verified the Contractor shall connect the GFE sensor and camera Ethernet connections to their equipment and verify operations at each site.
- 3.2.4.7 The SME from the EAA accompanying the Contractor's installer(s) will provide any assistance required to make configuration changes to the sensor and surveillance systems. Additionally, the SME will have the authority to validate the installation.

3.2.5 Lifecycle Management

- 3.2.5.1 The Contractor shall present an approach for lifecycle management (on-going maintenance and operational support services, customer care and help desk support to include electromagnetic interference (EMI)/radio frequency interference (RFI) resolution support). This shall include all hardware/software elements and ancillary items necessary for maintaining an operational availability of 99.5%. The Contractor shall discuss the approach to minimize mean time between failure and mean time to repair.
- 3.2.5.2 The Contractor shall use available commercial materials to the maximum extent possible.
- 3.2.5.3 The Contractor shall address warranty service, spare parts, and field support.
- 3.2.5.4 The Contractor shall provide OEM Documentation and Manuals for all Contractor Installed Equipment.
- 3.2.5.5 The Contractor shall identify long-lead item procurement risks, and provide mitigation.



- 3.2.5.6 The Contractor shall discuss maintenance support for all sites to include the replacement of defective components, upgrades to include commercial off-the-shelf (COTS) technology insertion, and any software updates, as required.
- 3.2.5.7 The Contractor shall plan for a complete tech refresh of all Contractor provided satellite communications terminal and ancillary equipment at all remote sites. The tech refresh shall be scheduled for the beginning of first option period (Year 6) as specified in Section 4.2. The Contractor should assume an annual rate of inflation of 2.5% of the proposed equipment price in Year 1.

3.2.6 Personnel Travel, Environmental, and Safety Hazards

The Contractor shall identify and assess personnel Travel, Environmental, and Safety Hazards for each of the remote sites for which contractor personnel are required to perform equipment installation.

3.2.7 EMI/RFI Identification and Resolution

The Contractor shall have a means of satellite communications EMI/RFI identification, characterization, and geo-location. The Contractor will be required to analyze and report all EMI/RFI to the Government and may be asked to participate in exercises involving EMI/RFI. The Contractor shall explain how EMI/RFI identification and resolution will be communicated to the Government.

3.2.8 Network Monitoring

- 3.2.8.1 The Contractor shall establish, and provide the U.S. Government access to a web portal to present the health of the entire solution in a consolidated view using data from multiple sources and provide alert notification via email for any change in network operational status. Access procedures for the web portal will be established after award.
- 3.2.8.2 The Contractor shall staff a 24/7/365 Network Operations Center (NOC) as a focal point for network access, technical support, and troubleshooting. NOC staff shall be English-speaking and U.S. citizens.



- 3.2.8.3 The Contractor shall provide status reporting on equipment status, network status, and network utilization. The Contractor shall create and manage trouble tickets. The Contractor shall produce monthly and annual resource utilization reports. These are post-award contract deliverables. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.9 Frequency Clearances and Approvals

- 3.2.9.1 The Contractor shall describe the frequency clearance requirements for each of the South American locations and explain how the requirements will be met to allow transmission in Host Nations. The Contractor shall support Host Nation Agreement (HNA) efforts in obtaining international approvals for radio spectrum operations under this contract in foreign nations. The Contractor shall ensure that international services provided under this contract may be provided as scheduled with the full approval of each affected host nation. Typical services may include, but are not limited to: HNA, landing rights, operating agreements, site licenses, and frequency clearances.
- 3.2.9.2 Frequency Clearances for all terminals shall be required prior to the start of managed network services.
- 3.2.9.3 Frequency Clearances shall be requested for the maximum time period allowed by the host nation, up to the life of the contract.
- 3.2.9.4 The Contractor shall provide the Government with copies of regulatory licenses and approvals obtained to operate and use the spectrum for countries within the required service region.

3.2.10 Additional Requirements

- 3.2.10.1 The Contractor shall provide all required software and firmware for all contractor furnished equipment. See Section L.22.2 regarding submission of post-award contract deliverables.
- 3.2.10.2 The Contractor will provide an unpriced Bill of Materials (BOM) in Microsoft Excel that will include services, equipment, and labor (See Attachment J-19 or J-20).

4.0 Performance

4.1 Locations



Work is to be performed at contractor facilities and at remote sites in South America. All equipment shall be shipped from the Contractor's facility to the remote sites in South America after successful completion of testing. All travel expenses, shipping costs, taxes, customs fees and tariffs will not be evaluated as part of the price proposal.

4.2 Period of Performance

The period of performance for this Task Order will be five (5) years. In addition to the CLINs priced by the Contractor during the 5-year period of performance (Years 1 through 5), the Contractor shall propose pricing for the two CS3 option periods: one (1) three-year option period (Years 6 through 8) followed by one (1) two-year option period (Years 9 and 10), and the FAR 52.217-8 six-month extension option.

In the first six months after contract award, the Contractor shall acquire, integrate, test, and deliver the requested capability.

5.0 Government Support

5.1 Government Furnished Equipment/Facilities:

- Power (110 VAC or 220 VAC) will be provided at two of the sites: Puerto Williams, Chile and Ventiocho de Novembre, Argentina).
- A complete sensor and motion-activated surveillance system will be provided for testing at the Contractor's facility. Upon successful completion of testing, all GFE will be returned to the Government. The GFE used for testing will be identical to the equipment at the remote locations.
- An approved remote site where the Contractor will install the self-contained environmental enclosure and terminal equipment.
- One sensor system has been installed at each of the six EAA site and has a standard Ethernet connection, the sensor system will require PoE: +5V / 250 mA or PoE IEEE 802.3af from the Contractor.
- One motion-activated surveillance camera system has been installed at each of the six EAA sites and has a standard Ethernet connection, they will require PoE: +5V / 250 mA or PoE IEEE 802.3af from the Contractor.

6.0 Security

The Contractor shall articulate processes and procedures to address the security requirements for personnel assigned to the task order. All Contractor personnel assigned to this task shall be US citizens and possess at least United States Moderate Background Investigation (MBI) public trust clearances.

The Contractor shall ensure that all controlled unclassified information is safeguarded in accordance with the guidance provided in DoDM 5200.1, Volume 4, Information Security Program: Controlled Unclassified Information (CUI).



7.0 Deliverables

7.1 Pre-Award Deliverables (Submitted with Contractor's Proposal)

The following deliverables will be used to document the comprehensiveness of the Contractor's complex satellite solution for the Environmental Data Network.

- FSS solutions require Link Budgets
- FSS solutions require maps with clearly depicted and labeled contour lines, demonstrating coverage across the required locations. Contour lines should clearly demonstrate satellite gain to noise temperature ratio (G/T), effective isotropic radiated power (EIRP),
- MSS solutions require coverage maps and contour lines.
- High-level Network Architecture diagram showing nodes and gateway locations
- Bill of Materials
- Original Equipment Manufacturer (OEM) Terminal/Equipment Technical Specifications (e.g. datasheets)
- Project Schedule (submitted in Adobe Portable Document Format (PDF))

7.2 Post-Award Deliverables

- Detailed Network Configuration Documentation, and Transmission Plans
- OEM Documentation and Manuals for all Contractor Installed Equipment.
- Test Plan
- Testing and installation completion reports
- HNA Frequency Clearances, Regulatory Licenses and Approvals
- Status Reports
- Detailed Network Configuration
- Transmission Plan (for FSS only)

8.0 Pricing

8.1 Instructions

Section B (Supplies or Services and Prices/Costs) and the STO #1 Excel Workbook (Attachment J-9) contain all pricing instructions.

(END OF SECTION J, ATTACHMENT J-10)



ATTACHMENT J-12

Sample Task Order (STO) #3 – BASE COMMUNICATIONS NETWORK FOR OUARGLA, ALGERIA

1.0 Introduction

The U.S. Government Organization (USGO) requires a complete solution for base communications in Ouargla, Algeria. The solution will be Government-owned contractor-operated. There are 42 buildings of concrete construction, of which 40 are located within a four (4) square mile area in the center of the base. Detailed architectural drawings are not available. The base is approximately (5 mi x 5 mi) 25 square miles. The base serves approximately 1,000 personnel stationed in the Sahara Desert and communications services are required for all buildings on the base. The buildings are one and two story buildings and there are no terrain features that will mask wireless transmissions within the base boundaries. Existing telecommunications infrastructure on the base installed by the Government provides Wide Area Network (WAN) and Local Area Network (LAN) connectivity for all buildings. All WAN and LAN networking components (e.g. wiring, switches, routers, etc.) have been installed and provide Power-over-Ethernet (PoE). The Central Office and demarcation is located in the Communications Center (Building G). The interface for all networks will be a fiber optic card with SC connection. The contractor can install equipment in wiring closets and the Government will provide space, power, and cooling for the equipment. All buildings have telco/network closets and are wired with 110VAC electrical outlets, Voice over Internet Protocol (VoIP) phones, and those with Internet access requirements are wired with at least one CAT 5 Ethernet cable jack per office or desk. All VoIP phones are connected to the Defense Switched Network (DSN) and NIPRNET (hereinafter referred to as NIPR).

2.0 Objective

The objective is to obtain a complex SATCOM solution that provides base communications meeting the objectives described in this STO. Included is engineering support, system design; hardware procurement, installation, integration, and testing; communications services; logistics support; and program management. The overall objective is for the Contractor to design, test, implement, operate and maintain a total solution that provides reliable communications for all personnel and units at the operating base at Ouargla, Algeria at the most affordable cost to the Government.

3.0 Summary of Requirements

The Contractor shall propose a solution compliant with all sample task order requirements that delivers the required quality of service and availability and articulates rationale for the choice of architecture and components, including life cycle cost considerations.



Services to be provided by the Contractor include:

- System design
- System Architecture and Documentation
- Integration
- Testing
- System Engineering
- On-going maintenance and operational support services
- Customer care and help desk support
- Wireless High-speed Internet service
- Wired CAT 5 Internet service
- Commercial encryption of the satellite link
- Cellular telephone service (base station 4G LTE (Long Term Evolution) and associated hardware) to provide voice and data transmission. Cellular phone service required for local (intra-base) and long distance (via DSN) calling
- Point of Sale (POS) Service for Government furnished POS terminals
- Satellite connectivity to the military base

3.1 Management Requirements

3.1.1 The Contractor shall provide a detailed project schedule (e.g., Microsoft Project or equivalent) in PDF format for the entire Task Order lifecycle.

3.1.2 The Contractor shall discuss:

- 3.1.2.1 The roles and responsibilities of the Contractor and Subcontractors that will contribute to the solution, how work will be partitioned among subcontractors (if applicable) and how subcontractors will be managed.
- 3.1.2.2 Procedures to ensure establishment and maintenance of the logical and physical enclaves of Government encrypted traffic (NIPR, SIPRnet (hereinafter referred to as SIPR), secure voice) and contractor-provided services to avoid spillage. Red and black separation is already provided on the base and all current network cabling is already isolated for public internet, NIPR and SIPR.
- 3.1.2.3 An approach for the implementation of a web portal to present the health of the entire solution in a consolidated view.
- 3.1.2.4 Program management approach, procedures, and performance metrics and provide an explanation of how they will be used to ensure timely system development, installation and operation.



- 3.1.2.5 Processes and procedures to comply with all workforce and environmental regulations prior to and during installation of telecommunications infrastructure (e.g., satellite terminal installation).
- 3.1.2.6 Identification and assessment of risks and a mitigation strategy that minimizes cost, schedule, and performance risk.
- 3.1.2.7 Management procedures to ensure network quality of service is not diminished during peak usage of wired Internet, wireless hotspots, and cellular service.
- 3.1.2.8 Process and procedures required to develop and furnish the deliverables in Section 7.2.

3.2 Technical Requirements

3.2.1 System Engineering

- 3.2.1.1 The Contractor shall develop and document the requisite communications infrastructure to meet the requirements.
- 3.2.1.2 The Contractor shall discuss how the design of the network and network components incorporates physical and logical hardening to withstand the rigors of the Sahara Desert conditions (e.g., extreme temperatures, haboob, etc.).
- 3.2.1.3 The Contractor shall explain the rationale for the proposed network and components, including lifecycle cost considerations. The Contractor shall discuss how lessons learned from previous projects were incorporated.
- 3.2.1.4 The Contractor shall clearly explain their recommendation for bandwidth, stating assumptions, to ensure that only the necessary amount of bandwidth is leased to support their proposed aggregate throughput requirements; additionally, the Contractor shall state their assumptions for network device (e.g. VoIP phone, computer, etc.) utilization estimates on NIPR, SIPR, public internet, and Wi-Fi, when engineering their solution. The Contractor shall explain the rationale for their proposed throughput and utilization estimates based off of the requirements in Section 3.2.6 and the assumptions made by the Contractor. The Contractor shall implement configuration management, prepare engineering documents and reference manuals, and provide engineering and testing services.



3.2.1.5 The Contractor shall identify valid installation challenges and risks (excluding any items provided Government Furnished Equipment (GFE)), and provide realistic mitigation for each.

3.2.1.6 The Contractor shall discuss how their system incorporates reliability, availability, maintainability, security, network monitoring and interoperability.

3.2.1.7 The Contractor shall address system flexibility and optimization, accommodating potential future needs to support either new sites or higher per-site data transfer needs or spectral optimization to minimize bandwidth needs.

3.2.2 System Design

The Contractor shall design a system that:

3.2.2.1 Is a closed network with no connection to Algerian telecommunications infrastructure.

3.2.2.2 Provides connectivity to a U.S. Government Gateway that will deliver voice and data services (NIPR) and secure voice and data (SIPR). The Government will install NIPR, SIPR, and sensitive but unclassified voice capabilities (i.e. Defense Switched Network (DSN)) and encrypt this traffic prior to connection to the contractor services. The Contractor must provide transport of this black core network from the operating base in Ouargla to a commercial teleport. The traffic will be backhauled from the commercial teleport to a DoD Gateway for connection to the DoD Information Network (DoDIN). For the purpose of this STO, the Contractor may connect to one of the following DoD Gateways: Lago di Patria, Italy; Ramstein Air Base (AB), Germany; Fort Belvoir, VA, or Naval SATCOM Facility (NAVSATCOMFAC), Northwest, VA for DoDIN access. The Contractor shall identify their proposed DoD gateway based on the most efficient terrestrial connection between their proposed commercial teleport and the DoD Gateway. The Contractor shall provide commercial grade encryption for their proposed SATCOM link(s) feeding the base's communications infrastructure.



- 3.2.2.3 Meets the required quality of service for high-speed Internet service, Voice over Internet Protocol (VoIP), video teleconferencing, and PoS, and meets or exceeds a system availability of 99.5% given the environmental conditions in the Sahara Desert. The Contractor is not required to include the pre-existing Government installed infrastructure in calculating their system availability for Mean Time between Failure.
- 3.2.2.4 The satellite link and network architecture is scalable and allows for new technology insertion and network expansion.
- 3.2.2.5 Provides a level of security appropriate for the level of information that will be processed. Minimum requirement is commercial grade encryption (e.g., Advanced Encryption Standard (AES) 256 bit encryption) for unclassified traffic over the satellite link. All DoDIN networks will be encrypted by the Government prior to connection to the Contractor's proposed network via a NSA approved Type 1 encryption device.
- 3.2.2.6 Provides access to the public internet (provided by the Contractor) for facilities and services specified in Table 1; in addition to, NIPR, SIPR and DSN (provided by the DoD Gateway).
- 3.2.2.7 Provides a 4G LTE cellular network that allows for local (on-base) and long distance (via DSN) calling. The Contractor shall assume that the base has no major terrain or local spectrum interference that will restrict the cellular network. The cellular network will interconnect with the DSN utilizing a 729a codec via Ethernet or fiber SC connection. The Government will permit the Contractor to utilize the existing WAN and LAN infrastructure for connectivity to the Wi-Fi access points and cellular radio network(s).
- 3.2.2.8 Provides public internet access and Wi-Fi hotspots to the buildings specified in Table 1 for Morale, Welfare and Recreation (MWR) and commercial transactions (i.e. POS) services.

3.2.3. The Contractor should provide a description of the system and network diagrams of all Offer installed network components that demonstrate connectivity between all required structures on the base to include physical and wireless connections, and access points for Government review/approval.



3.2.4 The Contractor shall develop a test plan for the network and provide it to the Government for review/approval no later than 30 days after award. The Government reserves the right to attend all tests. The Contractor shall provide completed test reports to the Government within ten (10) days of test completion. This will be a post-award contract deliverable. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.5 All equipment delivered as part of the complex satellite solution shall be new equipment. The Contractor shall provide Original Equipment Manufacturer (OEM) documentation for all of the Contractor installed equipment. The Offer shall provide the following equipment documentation with the proposal:

- Original Equipment Manufacturer (OEM) cellular base station specifications
- OEM network equipment specifications to include Wi-Fi hot spots
- OEM Satellite Terminal/Equipment Technical Specifications

3.2.5.1 The Contractor shall provide a high-level network architecture diagram showing nodes and gateway locations and a base coverage map of cellular service, including in-building and overall coverage. The Contractor should provide assumptions concerning the cellular network components (e.g. repeaters) required to deliver the Wi-Fi requirements.

3.2.5.2 The Contractor shall provide as-built drawings for all equipment installations. This will be a post-award contract deliverable. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.5.3 The Contractor shall provide software configurations for all equipment. This will be a post-award contract deliverable. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.6 Infrastructure and Communication Services Requirements

The Contractor's proposed satellite solution shall supports an aggregate data throughput that meets or exceeds the minimum Quality of Service requirements specified for voice, data and video traffic. The total number of base connections required is specified in Table 1. The Contractor shall describe their technical approach in developing their technical design.

3.2.6.1 The high-speed Internet Quality of Service minimum requirement is 128 kbps per computer on the network.



- 3.2.6.2 The VoIP Quality of Service minimum requirement is 32 kbps per VoIP phone.
- 3.2.6.3 The video teleconferencing Quality of Service minimum requirement is 128 kbps per conference room.
- 3.2.6.4 The Point of Sale (POS) Quality of Service minimum requirement is a rapid (4-6 seconds) satellite transmission of data to and from POS locations on the base to a credit card network for authorization of a transaction. All POS terminals are connected to the public internet.
- 3.2.6.5 The cellular telephone service minimum requirement is measured by the grade of service (GoS), which measures the ratio of unsuccessful calls to total calls attempted. For the cellular circuit, the minimum requirement for the GoS is 0.02. This means that two users of the circuit group out of a hundred will encounter a call refusal during peak traffic periods. The Government DSN voice system will meet the 0.02 GoS requirement for VoIP. Peak cellular use is not expected to exceed 50 simultaneous users. The cellular base station should be sized to support 1000 users to allow for future expansion. Current cellular user population is 300 devices. Users will access the cellular system using Government issued devices (e.g., iPhone, Blackberry, Android).
- 3.2.6.6 The Contractor shall provide the satellite transport infrastructure and communications services to support all wired and wireless (public internet, NIPR and SIPR), VoIP service (DSN), Video Teleconferencing (VTC), and POS service as described in Table 1 below.
- 3.2.6.7 Buildings requiring NIPR, SIPR, and secure voice will be connected to a Government black core network. The contractor is not required to procure, install, or operate any equipment for the black core network; however, this encrypted traffic will require transport via the contractor's commercial satellite backhaul to the contractor's teleport and require connection from the contractor's network to a Government point of presence.
- 3.2.6.8 Traffic, excluding the black core network, is expected to be 90% web (HTTP/HTTPS) and 10% other. Of the web traffic, up to 20% may be used for high-bandwidth services including video. The vast majority of voice calls are expected to be to destinations in Europe and the United States.



- 3.2.6.9 Existing telecommunications infrastructure provides WAN and LAN connectivity. The Contractor shall provide:
- Maintenance of the network including backhaul connections and equipment
 - Maintenance and testing of all circuits
 - Installation of all backhaul equipment
 - Verifying operation of computer connections, VoIP phones, and Wi-Fi hotspots for all buildings



Table 1. Infrastructure and Communications Services Requirements

Building	Description	Qty	Communication Service Requirement
Offices (A)	Two-Story building; 100 desks per building; 10 conference rooms per building	5	<ul style="list-style-type: none"> • 100 individual desks per building with Ethernet connection for VoIP phone (DSN) and NIPR • 10 conference rooms per building that provide 12 wired LAN ports; six (6) each for NIPR and SIPR access and one (1) video teleconferencing (VTC) unit connected to SIPR. • SIPR service required for 40 of the desks per building
Junior Enlisted Barracks (B)	Two-Story building; 100 private rooms occupied by two persons; 20,000 sq ft (200 ft x 50 ft) for each story	5	<ul style="list-style-type: none"> • Wi-Fi service for each building connected to public internet for Morale, Welfare and Recreation (MWR) supporting up to 200 connections per building • 10 VoIP phones (in common area) in each building
Senior Enlisted Barracks (D)	Two-Story building; 50 private rooms occupied by one person; one phone per room; 20,000 sqft (200 ft x 50 ft) for each story	1	<ul style="list-style-type: none"> • Wi-Fi service connected to public internet for Morale, Welfare and Recreation (MWR) supporting up to 100 connections. • 50 Ethernet connections (1 per room) for VoIP phone (DSN) and NIPR. • 15 Ethernet connections for SIPR
Officers Billeting (E)	One-Story building; 30 private rooms occupied by one person; one phone per room; 12,000 sq ft (300 ft x 40 ft)	1	<ul style="list-style-type: none"> • Wi-Fi service connected to public internet for Morale, Welfare and Recreation (MWR) supporting up to 60 connections. • 30 Ethernet connections (1 per room) for VoIP phone (DSN) and NIPR. • 20 Ethernet connections for SIPR
Senior Officer Residences (F)	One-Story; 1600 sq ft each (40 ft x 40 ft)	10	<ul style="list-style-type: none"> • Wi-Fi service connected to public internet for Morale, Welfare and Recreation (MWR) supporting up to 5 connections for each residence. • 1 Ethernet connections for each residence for VoIP phone (DSN) and NIPR. • 1 Ethernet connections for each private residence for SIPR
Communications Center (G)	Two-Story building, Central Office on top story	1	<ul style="list-style-type: none"> • 25 Ethernet connections for VoIP phone (DSN) and NIPR • 25 Ethernet connections for SIPR • 2 conference rooms that provide 10 wired LAN ports; five (5) each for NIPR and SIPR access and one video teleconferencing (VTC) unit. VTC will be connected to SIPR.
Base Headquarters (H)	One-Story	1	<ul style="list-style-type: none"> • 25 Ethernet connections for VoIP phone (DSN) and NIPR • 25 Ethernet connections for SIPR • 2 conference rooms that provide 20 wired LAN ports; ten (10) each for NIPR and SIPR access and one (1) video teleconferencing (VTC) unit connected to SIPR.
Supply Warehouse (I)	One-Story	2	<ul style="list-style-type: none"> • 5 Ethernet connections for VoIP phone (DSN) and NIPR per building • 2 Ethernet connections for SIPR per building
Armory (J)	One-Story	1	<ul style="list-style-type: none"> • 5 Ethernet connections for VoIP phone (DSN) and NIPR • 1 Ethernet connections for SIPR

Building	Description	Qty	Communication Service Requirement
Maintenance Facilities (K)	One-Story	3	<ul style="list-style-type: none"> • 3 Ethernet connections for VoIP phone (DSN) and NIPR per building • 1 Ethernet connections for SIPR per building
Commissary (L)	One-Story	1	<ul style="list-style-type: none"> • 3 Ethernet connections for VoIP phone (DSN) only • 12 Ethernet connections to public internet for point of sale (POS) terminals
Gas Station (M)	One-Story	1	<ul style="list-style-type: none"> • 1 Ethernet connection for VoIP phone (DSN) only • 6 Ethernet connections to public internet for point of sale (POS) terminals
Base Exchange (N) 8000 sqf ft (80 ft x 100 ft)	One-Story	1	<ul style="list-style-type: none"> • 3 Ethernet connections for VoIP phone (DSN) only • 12 Ethernet connections to public internet for point of sale (POS) terminals • Wi-Fi service connected to public internet supporting up to 200 connections
MWR Facility (O) 6300 sqf ft (70 ft x 90 ft)	Two-Story	1	<ul style="list-style-type: none"> • 15 Ethernet connections for VoIP phone (DSN) only • 15 Ethernet connection for public internet • 4 Ethernet connections to public internet for point of sale (POS) terminals • Wi-Fi service connected to public internet supporting up to 100 connections
Base Dining Facility (P) 10,000 sqf ft (100 ft x 100 ft)	One-Story	1	<ul style="list-style-type: none"> • 3 Ethernet connections for VoIP phone (DSN) only • 5 Ethernet connection for public internet • Wi-Fi service connected to public internet supporting up to 100 connections
Base Library (Q) 6300 sqf ft (70 ft x 90 ft)	One-Story	1	<ul style="list-style-type: none"> • 5 Ethernet connections for VoIP phone (DSN) only • 10 Ethernet connection for public internet • Wi-Fi service connected to public internet supporting up to 50 connections
Base Security (R)	One-Story	1	<ul style="list-style-type: none"> • 10 Ethernet connections for VoIP phone (DSN) and NIPR • 5 Ethernet connections for SIPR
Base Fire Department (S)	One-Story	1	<ul style="list-style-type: none"> • 5 Ethernet connections for VoIP phone (DSN) and NIPR • 2 Ethernet connections for SIPR
Base Medical Facility (T)	One-Story	1	<ul style="list-style-type: none"> • 20 Ethernet connections for VoIP phone (DSN) and NIPR • 5 Ethernet connections for SIPR
Base Chapel (U)	One-Story	1	<ul style="list-style-type: none"> • 4 Ethernet connections for VoIP phone (DSN) and NIPR •
Base Entrance Facility (V)	One-Story	2	<ul style="list-style-type: none"> • 2 Ethernet connections for VoIP phone (DSN) and NIPR per building • 1 Ethernet connection for SIPR per building

3.2.7 Additional Infrastructure and Services Requirements

3.2.7.1 The Contractor shall provide all public Internet access through a U.S. based Internet Point of Presence (PoP).



3.2.7.2 The Contractor shall provide cellular telephone service with a service coverage area of the entire operating base in Ouargla, Algeria (5 mi x 5 mi) 25 square miles. The cellular network shall provide connectivity to the base DSN phone service and the Contractor provided public Internet.

3.2.7.3 Computers and laptops using the network will be Government owned. The Contractor is not required to provide any computers or laptops as part of the solution.

3.2.7.4 All off-base calling (including cellular) will be via DSN

3.2.8 Lifecycle Management

3.2.8.1 The Contractor shall present an approach for lifecycle management (on-going maintenance and operational support services, customer care and help desk support to include electromagnetic interference (EMI)/radio frequency interference (RFI) resolution support. The Contractor shall provide a logistics support plan that maximizes use of standard commercial off the shelf equipment, interoperable components, and minimizes numbers and types of spares. The plan shall address inventory management, and maintenance planning, to include the approach to minimize the mean time between failure and mean time to repair. This will be a post-award contract deliverable. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.8.2 The managed network services shall include space segment, teleport, and terrestrial components as necessary to ensure a complete end-to-end communications solution.

3.2.8.3 Space segment coverage is only required for Algeria.

3.2.8.4 The Contractor shall meet or exceed a 99.5% link availability for all required satellite links.

3.2.8.5 The Contractor shall develop and provide link budgets and shall provide maps with clearly depicted and labeled contour lines, demonstrating coverage across the required locations. Contour lines should clearly demonstrate satellite gain to noise temperature ratio (G/T), effective isotropic radiated power (EIRP), and elevation angle values for proposed satellite(s) and covered region. The Contractor shall develop and provide a detailed network architecture, configuration documentation, and transmission plans (these will be a post-award contract deliverable). See Section L.22.2 regarding submission of post-award contract deliverables.



- 3.2.8.6 The Contractor shall have a means of satellite communications electromagnetic interference (EMI) and radio frequency interference (RFI) identification, characterization, and geo-location. The Contractor will be required to analyze and report all EMI/RFI to the Government and may be asked to participate in exercises involving EMI/RFI.
 - 3.2.8.7 The Contractor will be required to meet Federal and DoD Information Assurance requirements for a Moderate Impact Information System. The Contractor's information assurance boundary is where the Contractor's services connect to the user terminals/equipment (i.e., includes satellite command encryption (ground and space); systems used in the Satellite Operations Centers (SOCs), Network Operations Centers (NOCs), and teleport).
- 3.2.9 Frequency Clearances and Approvals
- 3.2.9.1 The Contractor shall describe the frequency clearance requirements for satellite terminal(s) and explain how the requirements will be met to allow transmission in Host Nations. The Contractor shall support Host Nation Agreement (HNA) efforts in obtaining international approvals for radio spectrum operations under this contract in foreign nations. The Contractor shall ensure that international services provided under this contract may be provided as scheduled with the full approval of each affected host nation. Typical services may include, but are not limited to: host nation approvals, landing rights, operating agreements, site licenses, and frequency clearances.
 - 3.2.9.2 If additional host nation support becomes necessary during the life of the task order, contract line item numbers will be added to the order at the time they are required and shall be invoiced at pass-through rates. The Contractor may be required to provide HNAs for any nation covered within the limits defined in the coverage area, as needed by the user.
 - 3.2.9.3 Frequency Clearances shall be requested for the maximum time period allowed by the host nation, up to the life of the contract.
 - 3.2.9.4 The Contractor shall provide the Government with copies of regulatory licenses and approvals obtained to operate and use the spectrum for countries within the required service region.



3.2.9.5 Frequency clearance for the cellular system will be coordinated by the base spectrum manager. The Offer may assume that there is no local frequency interference that would impede the deployment of their proposed cellular network.

3.2.9.6 Wi-Fi hotspots are low power and typically not included in frequency approvals.

3.2.10 Network Monitoring

3.2.10.1 The Contractor shall staff a 24/7/365 Network Operations Center (NOC) as a focal point for network access, technical support, and troubleshooting. NOC staff shall be English-speaking and U.S. citizens.

3.2.10.2 The Contractor shall be required to coordinate with planners, managers and operators at U.S. Africa Command J-6 and the DoD Gateway where the Contractor connects to the network. The Contractor shall describe the processes and procedures for coordination with these organizations.

3.2.10.3 The Contractor shall provide status reporting on equipment status, network status, and network utilization. The Contractor shall create and manage trouble tickets. The Contractor shall produce monthly and annual resource utilization reports. These will be post-award contract deliverables. See Section L.22.2 regarding submission of post-award contract deliverables.

3.2.10.4 The Contractor shall establish, and provide the U.S. Government access to a web portal to present the health of the entire solution in a consolidated view using data from multiple sources. Access procedures for the web portal will be established after award. The Government requires the Contractor to provide the fault/incident/outage reports to the Base Communications Center and the DoD Gateway that the Contractor connects to. The Contractor is responsible for storing/maintaining fault/incident/outage reports and current network operational status on the Web Portal. Storage/archival requirement is 12 months of this data.

3.2.11 Additional Requirements



- 3.2.11.1 The Contractor shall provide all required software and firmware for all contractor furnished equipment. This will be a post-award contract deliverable. See Section L.22.2 regarding submission of post-award contract deliverables. The Contractor shall be responsible for system administration, maintaining back-ups/restoral capability, firewall management, and system security to include maintaining IA compliance of all Contractor provided network equipment.
- 3.2.11.2 The Contractor will provide an unpriced Bill of Materials (BOM) in Microsoft Excel that will include services, equipment, and labor (Attachment J-13).
- 3.2.11.3 The Contractor shall specify all site preparation requirements for Contractor provided terminals and/or shelters. The Government will coordinate for all site preparation (e.g. antenna pads, anchor points, power, grounding) prior to the arrival of Contractor equipment. The southern side of the Communications Center (building G) is clear of obstructions to allow for antenna placement.

4 Performance

4.1 Locations

Work is to be performed at Government facilities. Equipment shall be shipped to the USGO location in Algeria by Government transport. The Contractor shall deliver the equipment to a USGO CONUS location (specified after award) for subsequent shipment by the Government to Algeria. The Contractor is not required to provide shipping costs or details and will not need to identify local duties or taxes, Import or export duty fees on equipment. Technical support for operations and maintenance will be required at the USGO location in Algeria.

4.2 Period of Performance

The period of performance for this Task Order will be five (5) years.

In the first six (6) months after contract award, the Contractor shall acquire, integrate, test, and deliver the requested capability.

5 Government Support

Contractor support will be provided in accordance with the US Africa Command Reporting Instructions (<http://www.africom.mil/newsroom/documents>). The Government will provide pre-deployment preparation, food, lodging, emergency medical treatment, and other life support for contractors assigned to support the USGO location in Algeria.



5.1 Government Furnished Equipment/Facilities

The Government will provide contractor workspace in Maintenance Facility, Building (K) and Communications Center, Building (G).

The Government will provide space to install, manage, and maintain equipment in the Communications Center, Building (G) and for equipment storage in one of the Supply Warehouses, Building (I).

The Government will provide the Communications Security (COMSEC) equipment (e.g., Secure Terminal Equipment (STE) or Viper) for voice services and High Assurance Internet Protocol Encryptor (HAIZE) for SIPR services.

The Government will provide Point of Sale (POS) terminals. The POS terminals require an Ethernet connection to the public Internet.

The Government will provide a ground mounting location for the satellite antenna and a structure to house the remainder of the satellite equipment.

The Government will provide 110 VAC and 220 VAC for primary power for satellite components, to include baseband equipment and other network components.

The Government will provide all local systems administration and network management of the NIPR, SIPR and VoIP (DSN) networks.

The Government will provide all VoIP devices (Cisco Unified IP Phone 7961g employing G.729a audio compression codec).

6 Security

The Contractor shall articulate processes and procedures to address the security requirements for personnel assigned to the task order.

6.1 Contractor personnel will be required to have Government authorization, a U.S. SECRET clearance, a U.S. Government-issued Common Access Card, an approved Visitor Authorization Request to access the USGO facility in Ouargla, Algeria, and meet the applicable U.S. Africa Command Reporting Instructions requirements prior to travelling.

6.2 All Contractor personnel with access to key operational security information (e.g., unit locations, troop movement information) and key personnel (e.g., Program Manager) and all Contractor personnel performing system administration functions shall possess United States SECRET security clearances.



6.3 The Contractor shall ensure that all sensitive and classified information is safeguarded in accordance with the guidance provided in the CS3 DD254. Although the Contractor may be provided access to SECRET information in order to accomplish tasks, documents generated shall not include classified information unless directed by the Government and in accordance with classification guidelines and standards for documentation.

7 Deliverables

7.1 Pre-Award Deliverables (Submitted with Contractor's Proposal)

The following deliverables will be used to document the comprehensiveness of the Contractor's complex satellite solution for the Base Communications Network for Ouargla, Algeria.

- Satellite Link Budget
- Original Equipment Manufacturer (OEM) cellular base station specifications
- OEM Satellite Terminal/Equipment Technical Specifications
- OEM network equipment specifications to include Wi-Fi hot spot
- Base coverage map of cellular service, including in-building and overall coverage
- High-level Network Architecture diagram showing nodes and gateway locations
- Maps with clearly depicted and labeled contour lines, demonstrating coverage across the required locations. Contour lines should clearly demonstrate satellite gain to noise temperature ratio (G/T), effective isotropic radiated power (EIRP), and elevation angle values for proposed satellite(s) and covered region
- Bill of Materials
- Schedule

7.2 Post-Award Deliverables

- Test Plan
- Logistics Support Plan
- HNA Frequency Clearances, Regulatory Licenses and Approvals
- As-built Drawings
- Software Configurations
- Status Reports
- All required software and firmware for Contractor furnished equipment
- Original Equipment Manufacturer (OEM) documentation for all of the Contractor installed equipment, reference manuals and engineering documents

8 Pricing

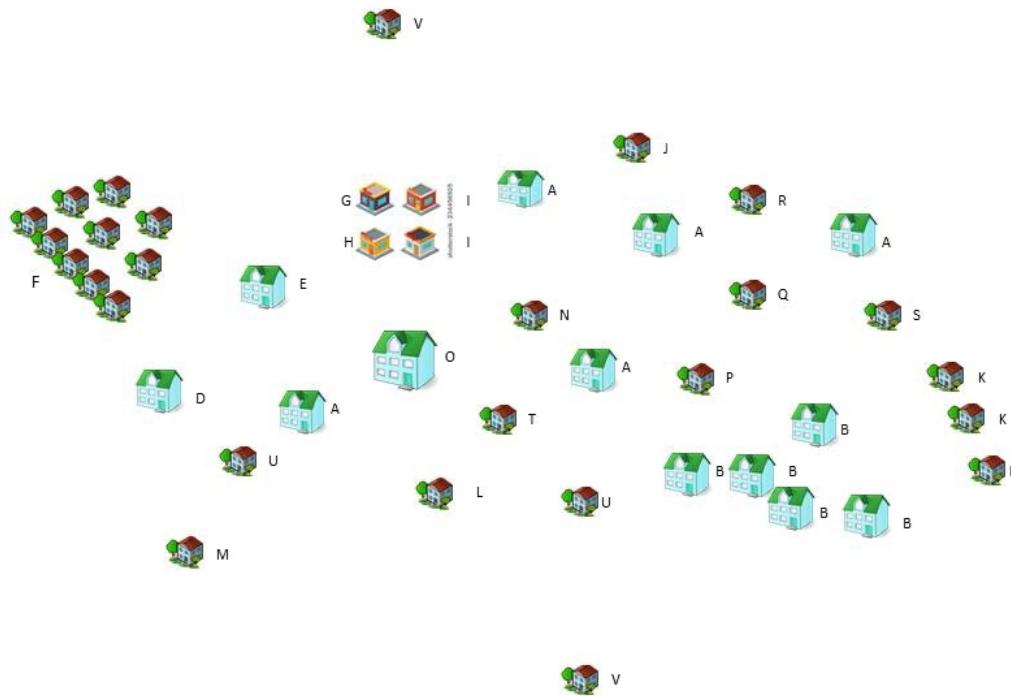
The Contractor is not required to provide any pricing for this Task Order at this time.



9 U.S, Base Ouargla, Algeria Diagram

The below diagram depicts the structures requiring services. There are 42 buildings, of which 40 are located within a 4 square mile area in the center of the base. The base is approximately (5 mi x 5 mi) 25 square miles. The base entrances are approximately 1.5 miles from the center of the base.

Note: The diagram is not drawn to scale.



U.S. BASE, OUARGLA, ALGERIA

(END OF SECTION J, ATTACHMENT J-12)



ATTACHMENT J-14
DD FORM 254 TEMPLATE

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DEPARTMENT OF DEFENSE CONTRACT SECURITY CLASSIFICATION SPECIFICATION <i>The requirements of the DoD Industrial Security Manual apply to all security aspects of this effort)</i>	1. CLEARANCE AND SAFEGUARDING a. FACILITY CLEARANCE REQUIRED: SECRET b. LEVEL OF SAFEGUARDING REQUIRED: SECRET
--	---

2. THIS SPECIFICATION IS FOR: (X and complete as applicable)	3. THIS SPECIFICATION IS: (X and complete as applicable)
<input checked="" type="checkbox"/> a. PRIME CONTRACT NUMBER GS00Q17NRD4013	<input checked="" type="checkbox"/> a. ORIGINAL (Complete date in all cases) Date (YYYYMMDD)
b. SUBCONTRACT NUMBER	<input type="checkbox"/> b. REVISED (Supersedes all previous specs) Revision No. Date (YYYYMMDD)
c. SOLICITATION OR OTHER NUMBER DUE DATE (YYYYMMDD)	<input type="checkbox"/> c. FINAL (Complete item 5 in all cases) Date (YYYYMMDD)

4. IS THIS A FOLLOW-ON CONTRACT? YES NO, If yes, complete the following:
Classified material received or generated under _____ (Preceding Contract Number) is transferred to this follow-on contract

5. IS THIS A FINAL DD FORM 254 YES NO, If yes, complete the following:
In response to the contractor's request dated _____ retention of the classified material is authorized for the period of:

6. CONTRACTOR (Include Commercial and Government Entity (CAGE) Code)

a. NAME, ADDRESS, AND ZIP CODE	b. CAGE CODE	c. COGNIZANT SECURITY OFFICE (Name, Address, and Zip Code)

7. SUBCONTRACTOR

a. NAME, ADDRESS, AND ZIP CODE	b. CAGE CODE	c. COGNIZANT SECURITY OFFICE (Name, Address, and Zip Code)

8. ACTUAL PERFORMANCE

a. NAME, ADDRESS, AND ZIP CODE	b. CAGE CODE	c. COGNIZANT SECURITY OFFICE (Name, Address, and Zip Code)

9. GENERAL IDENTIFICATION OF THIS PROCUREMENT: This contract is to provide global satellite transmission services as specified in the statement of work associated with the respective task order.

10. CONTRACT WILL REQUIRE ACCESS TO	YES	NO	11. IN PERFORMING THIS CONTRACT, THE CONTRACTOR WILL:	YES	NO
a. COMMUNICATIONS SECURITY (COMSEC) INFORMATION	<input checked="" type="checkbox"/>		a. HAVE ACCESS TO CLASSIFIED INFORMATION ONLY AT ANOTHER CONTRACTORS FACILITY OR GOVERNMENT ACTIVITY		<input checked="" type="checkbox"/>
b. RESTRICTED DATA		<input checked="" type="checkbox"/>	b. RECEIVE CLASSIFIED DOCUMENTS ONLY		<input checked="" type="checkbox"/>
c. CRITICAL NUCLEAR WEAPON DESIGN INFORMATION		<input checked="" type="checkbox"/>	c. RECEIVE AND GENERATE CLASSIFIED MATERIAL	<input checked="" type="checkbox"/>	
d. FORMERLY RESTRICTED DATA		<input checked="" type="checkbox"/>	d. FABRICATE, MODIFY, OR STORE CLASSIFIED HARDWARE	<input checked="" type="checkbox"/>	
e. INTELLIGENCE INFORMATION			e. PERFORM SERVICES ONLY		<input checked="" type="checkbox"/>
(1) Sensitive Compartmented Information (SCI)		<input checked="" type="checkbox"/>	f. HAVE ACCESS TO US CLASSIFIED INFORMATION OUTSIDE THE U.S., PUERTO RICO, U.S. POSSESSIONS AND TRUST TERRITORIES	<input checked="" type="checkbox"/>	
(2) Non-SCI	<input checked="" type="checkbox"/>		g. BE AUTHORIZED TO USE THE SERVICES OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) OR OTHER SECONDARY DISTRIBUTION CENTER	<input checked="" type="checkbox"/>	
f. SPECIAL ACCESS INFORMATION		<input checked="" type="checkbox"/>	h. REQUIRE A COMSEC ACCOUNT	<input checked="" type="checkbox"/>	
g. NATO INFORMATION		<input checked="" type="checkbox"/>	i. HAVE TEMPEST REQUIREMENTS	<input checked="" type="checkbox"/>	
h. FOREIGN GOVERNMENT INFORMATION		<input checked="" type="checkbox"/>	j. HAVE OPERATIONS SECURITY (OPSEC) REQUIREMENTS	<input checked="" type="checkbox"/>	
i. LIMITED DISSEMINATION INFORMATION		<input checked="" type="checkbox"/>	k. BE AUTHORIZED TO USE THE DEFENSE COURIER SERVICE	<input checked="" type="checkbox"/>	
j. FOR OFFICIAL USE ONLY INFORMATION	<input checked="" type="checkbox"/>		l. OTHER (specify) SEE ITEM #13 (1) Visit Access Requests (2) Have Information Assurance Requirements (3) Ensure subcontractors comply with all DD-254 requirements	<input checked="" type="checkbox"/>	
k. OTHER (Specify) (1) Personnel Minimum Security Clearance	<input checked="" type="checkbox"/>				

12. PUBLIC RELEASE. Any information (classified or unclassified) pertaining to this contract shall not be released for public dissemination except as provided by the Industrial Security Manual or unless it has been approved for public release by appropriate U.S. Government authority. Proposed public releases shall be submitted for approval prior to release.

DIRECT THROUGH (Specify)

DISA Public Affairs/CIO Offices, GSA Public Affairs, USSOCOM Public Affairs Officer for SCAMPI Information, Future COMSATCOM Services Acquisition Contracting Officers, DITCO Ordering Authority (for DoD task orders).

to the Directorate for Freedom of Information and Security Review, Office of the Assistant Secretary of Defense (Public Affairs)* for review.
*In the case of non-DoD User Agencies, requests for disclosure shall be submitted to that agency.

13. SECURITY GUIDANCE. The security classification guidance needed for this classified effort is identified below. If any difficulty is encountered in applying this guidance or if any other contributing factor indicates a need for changes in this guidance, the contractor is authorized and encouraged to provide recommended changes; to challenge the guidance or the classification assigned to any information or material furnished or generated under this contract; and to submit any questions for interpretation of this guidance to the official identified below. Pending final decision, the information involved shall be handled and protected at the highest level of classification assigned or recommended. (Fill in as appropriate for the classified effort. Attach, or forward under separate correspondence, any documents/guides/extracts referenced herein. Add additional pages as needed to provide complete guidance.)

10a. The requirements and procedures for the protection of COMSEC information are set forth in the National Industrial Security Program Operating Manual (NISPO) [current edition: DoD 5220.22-M dated February 28, 2006]. The COMSEC requirements of the NISPO are imposed on the contractor for safeguarding the COMSEC information. Contractor is authorized to receive Government furnished cryptographic equipment. Access to any classified COMSEC information requires special briefings at the contractor's facilities. Access to classified COMSEC information requires a final U.S. Government clearance at the appropriate level. Non-accountable COMSEC information, though not tracked in the COMSEC material control system, may still require a level or control within a document control system; refer to NSA/CSS Manual 3-16, Control of Communications Security Material, page E-4 for guidance. Methods of destruction of classified COMSEC material shall comply with the NISPO (Ref: Section 5-705 of DoD 5220.2-M). Further disclosure of COMSEC information by a contractor, to include subcontracting, requires prior approval of the government contracting activity. DoD 5220.22-M provided under separate cover.

10e(2). The contractor will abide by DCID 6/6 (formerly 1/7), Security Controls on the Dissemination of Intelligence Information, 11 July 2001. This document must be ordered upon receipt of COMSEC account.

10j. For Official Use Only information provided under this contract shall be safeguarded as specified in the NISPO and the Defense Information System Network (DISN) Security Classification Guide [current edition: DISA Circular 300-110-3 dated August 14, 2008]. Contractor will be provided with and will abide by DoD Regulation 5400.7, DoD Freedom of Information Act Program, and DoDM 5200.1, Volume 4, Information Security Program: Controlled Unclassified Information (CUI). DISA Circular 300-110-3 and DoD Regulations 5400.7 and DoDM 5200.1, Volume 4 provided under separate cover.

14. ADDITIONAL SECURITY REQUIREMENTS. Requirements, in addition to ISM requirements, are established for this contract YES NO

(If Yes, identify the pertinent contractual clauses in the contract document itself, or provide an appropriate statement which identifies additional requirements. Provide a copy of the requirements to the cognizant security office. Use Item 13 if additional space is required.)

TEMPEST requirements apply; guidance provided in block 13 as reference item 11i. OPSEC requirements apply; guidance provided in block 13 as reference item 11j. Information Assurance requirements apply; guidance provided in block 13 as reference item 11(2). Subcontractor compliance requirements apply; guidance provided in block 13 as reference item 11(3).

15. INSPECTIONS. Elements of this contract are outside the inspection responsibility of the COGNIZANT SECURITY OFFICE. YES NO

(If yes, explain and identify specific areas or elements carved out and the activity responsible for inspections. Use Item 13 if additional space is needed.)

16. CERTIFICATION AND SIGNATURE. Security requirements stated herein are complete and adequate for safeguarding the classified information to be released or generated under this classified effort. All questions shall be referred to the official named below.

a. TYPED NAME OF CERTIFYING OFFICIAL Donald V. Carlson	b. TITLE Manager, Security Solutions Branch	c. TELEPHONE (Include Area Code) (703) 306-6261
--	---	---

d. ADDRESS (Include Zip Code)
GSA/FAS/ITC, Operations Division, (QTCAB)
1800 & F Street NW, Room 7011B
Washington DC 20405

e. SIGNATURE

X

Donald V. Carlson
Systems and Security Program Manager

17. REQUIRED DISTRIBUTION

- | | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | a. CONTRACTOR |
| <input type="checkbox"/> | b. SUBCONTRACTOR |
| <input checked="" type="checkbox"/> | c. COGNIZANT SECURITY OFFICE FOR PRIME AND SUBCONTRACTOR |
| <input checked="" type="checkbox"/> | d. U.S. ACTIVITY RESPONSIBLE FOR OVERSEAS SECURITY ADMINISTRATION |
| <input checked="" type="checkbox"/> | e. ADMINISTRATIVE CONTRACTING OFFICER |
| <input type="checkbox"/> | f. OTHERS AS NECESSARY
DISA Industrial Security (MPS6) |



ATTACHMENT J-15 DD FORM 254 TEMPLATE CONTINUATION PAGES

Prime Contract Number: GS00Q17NRD4013
Contractor (RiteNet Corp.)

10k(1). IAW DoD 5200.2-R, Personnel Security Program (current edition: January 1987, through Change 3, February 23, 1996), Contractor positions established in support of the Complex Commercial SATCOM Solutions (CS3) contract are assigned to one of two sensitivity designations Automated Data Processing II (ADP-II), Non-critical-Sensitive Positions or ADP-III, Non-sensitive Positions. The Contractor will ensure that individuals assigned to each sensitivity designation, as determined by the Government, have completed the appropriate forms and investigations. Necessary security clearances will be based on Defense Security Service (DSS) checks.

Required investigations will be completed prior to the assignment of individuals to sensitive duties associated with the position. The Contractor will forward employee clearance information to Defense Information System Agency (DISA) Industrial Security (MPS6).

DISA retains the right to request removal of Contractor personnel, regardless of prior clearance or adjudication status, whose action, while assigned to activities associated with this contract, clearly conflict with the interests of the Government. The reason or removal will be fully documented in writing by the Contracting Officer. When and if such removal occurs, the Contractor will within 30 working days assign qualified personnel to any vacancies thus created.

DoD 5200.2-R provided under separate cover.

11c: Contractor will reference the appropriate security classification guidance when generating or deriving classified material or hardware. All classified information received or generated will be properly stored and handled according to the markings on the material. All classified information received or generated is the property of the U.S. Government. At the termination or expiration of this contract, the U.S. Government will be contacted for proper disposition instructions. Contractor will abide by the following security classification guidance:

- DISA Circular 300-110-3, "Defense Information System Network (DISN) Security Classification Guide" [current edition dated August 14, 2008]. DISA Circular 300-110-3 provided under separate cover.
- DoDM 5200.01 Volume 1, Security Program Overview; Volume 2, Marking of Classified; and Volume 3, Protection of



Classified. DoDM 5200.01 Volumes 1, 2 and 3 will be provided under separate cover.

11d: The Contractor is required to store Communications Security (COMSEC) equipment (i.e., STEs), and associated keying material (i.e., Fortezza cards), classified document hardcopies, classified document softcopies and is required to have the following requirement(s): not less than an GSA-approved, 2 drawer, 2 cubic feet safe for storage of classified material.

11f: Contractor and its Subcontractors, when traveling or performing work outside the United States, Puerto Rico, and U.S. Possessions and Trust Territories under this contract shall:

- i. Affiliate with the Overseas Security Advisory Council, if the Contractor or Subcontractor is a U.S. entity;
- ii. Ensure personnel who are in-country on a non-transitory basis, register with the U.S. Embassy, and that Contractor or Subcontractor personnel who are third country nationals comply with any security related requirements of the Embassy of their nationality;
- iii. Provide personnel with antiterrorism/force protection awareness information commensurate with that the DoD provides to its military and civilian personnel, to the extent such information can be made available prior to travel outside the U.S.;
- iv. Obtain and comply with the most current antiterrorism/force protection guidance for Contractor personnel;
- v. Restrict performance of classified work to the sites indicated in the individual task orders.

11g: Technical information on file at the Defense Technical Information Center (DTIC) will be made available to the Contractor if the Contractor requires such information.

11h: The requirements and procedures for the protection of COMSEC information are set forth in the National Industrial Security Program Operating Manual (NISPOM) [current edition: DoD 5220.22-M dated February 28, 2006, Incorporating Change 1, March 28, 2013]. The COMSEC requirements of the NISPOM are imposed on the Contractor for safeguarding the COMSEC information. Contractor is authorized to receive Government furnished cryptographic equipment. Access to any classified COMSEC information requires special briefings at the Contractor's facilities. Access to classified COMSEC information requires a final U.S. Government clearance at the appropriate level. Non-accountable COMSEC information, though not tracked in



the COMSEC material control system, may still require a level or control within a document control system; refer to NSA/CSS Manual 3-16, Control of Communications Security Material, page E-4 for guidance. Methods of destruction of classified COMSEC material shall comply with the NISPOM (Ref: Section 5-705 of DoD 5220.22-M). Further disclosure of COMSEC information by a Contractor, to include subcontracting, requires prior approval of the Government contracting activity. DoD 5220.22-M and NSA/CSS Manual 3-16 provided under separate cover.

11i: The Contractor shall not process classified information by electrical means prior to a DISA TEMPEST evaluation of the equipment/systems and facility, and written DISA certification that the facility meets DISA TEMPEST criteria. In order to expedite the DISA TEMPEST evaluation, the Contractor shall provide a list of equipment, to include model number, which is associated with the processing of classified information. In addition, the estimated percentage of classified information processed, cable/conduit runs, a floor plan layout that depicts placement of equipment in relation to other rooms, equipment distances from walls or uncontrolled areas, and physical security being afforded the equipment both during processing and after hours. The above TEMPEST evaluation and DISA approval will not be required if previous DISA approval can be furnished and is no more than 2 years old. The existing approval must be for processing information at the same or higher level and at the same facility and items of equipment. The DISA Certified TEMPEST Technical Authority is the only authorized approving agent for TEMPEST systems within DISA.

11j: The Contractor will comply with Operations Security (OPSEC) requirements contained in the contract, NISPOM (Ref: DoD 5220.22-M), and the Industry Security Regulation (Ref: DoD 5220.22-R, Chapter 10, *Operations Security (OPSEC)*). Contractual OPSEC requirements above those contained within NISPOM shall be included in the appropriate requisition documentation (e.g., Task Order (TO) Request for Proposal) and resultant contract addendum (e.g., TO Order in sufficient detail to ensure complete Contractor understanding of exactly what special OPSEC provisions are required. DoD 5220.22-R provided under separate cover.

11k: Contractor authorization to use the Defense Courier Service will be obtained IAW DoDI 5200.33, "Defense Courier Operations" [Current edition: June 30, 2011]. DoDI 5200.33 provided under separate cover.

11l(1): All Visit Access Requests (VARs) by Contractors shall be sent via the Joint Personnel Adjudication System (JPAS) to the DISA VAR Center (JPAS SMO:DKABAA10) or appropriate Security Management Office (SMO) for the effort. The COR/TM must be notified and approve the VAR and need to know certification prior to sending the request to the facility being visited. Contractors must also provide a copy of the VAR to the security manager.



11I(2): The Contractor will comply with the Information Assurance (IA) requirements contained in the contract. Minimum IA requirements provided under separate cover.

11I(3): The Contractor will include all DD-254 requirements in all subcontracts necessary to delivery COMSATCOM services meeting the requirements contained in the contract and in this DD-254 (e.g., vendor providing satellite bandwidth for a specific Task Order). Contractor will ensure Subcontractor compliance with all DD-254 requirements.

General Information:

The COR/TM must be notified and approve the receipt and/or generation of classified information under this contract.

All classified information received and/or generated under this contract is the property of the U.S. Government regardless of proprietary claims. Upon completion or termination of this contract, the U.S. Government will be contacted for destruction or disposition instructions.

(END OF ATTACHMENT J-15)



ATTACHMENT J-17 Sample Task Order Link Budget Template

Template Instructions

Please use one tab per link when submitting your Link Budgets. For each additional link past the first, new tabs should be created and completed. For example, a full duplex, 512 kbps link would require two tabs in the link budget template. One tab would be the link showing site A to site B while the second tab would demonstrate the link from site B to site A. One workbook with multiple tabs may be used for all links; it is not necessary to submit separate workbook files for each link. Please use a separate workbook file for each STO. Definitions for each parameter in the link budget are below.

Top of Document (header information)

LINK NAME	Descriptive name for the link contained on that tab.
Sample Task Order #:	Indicate the STO to which the Contractor is responding.
DATE	Date link budget prepared

Block 1, Satellite Characteristics

1a. Satellite Name	Name of satellite being proposed
1b. Satellite Longitude (West/East) [deg]	Orbital location of satellite
1c. Uplink/Downlink Beam	Uplink/Downlink Beam name on which proposed transponder is located (ie. MEK, NA, Regional, etc.)
1d. Transponder Id	Name of transponder (ie. 23k, NEAVA4, etc.)
1e. Type of Band (C,Ku,C/Ku,Ku/C,X)	Band of beam provided
1f. Xpdr Total Bandwidth [MHz]	Total BW on proposed transponder
1g. UL Beam Polarization (V,H,L,R)	Uplink polarization
1h. DL Beam Polarization (V,H,L,R)	Downlink polarization
1i. Xpdr SFD (@ 0 dbi/K G/T) [dBW/m2]	Current or proposed SFD setting of transponder

Block 2, Carrier Parameters

2a. Data Rate (including "Overhead") [kbps]	Total Data rate of proposed carrier
2b. Modulation Scheme (1-BPSK,2-QPSK,3-8PSK ... others)	Modulation used for proposed carrier
2c. Coding Type (Conv., Conv+RS, TPC, LDPC)	Type of encoding utilized

2d. Inner Code Rate (FEC Rate/Code Rate)	Inner code rate used for carrier		
2e. Outer Code Rate (e.g. Reed/Solomon)	Outer code rate used for carrier		
2f. Rolloff Factor/Spacing Factor	Rolloff factor of carrier		
2g. Required Eb/No Threshold [dB]	Eb/No threshold required to maintain link closure		
2h. Bit Error Rate (BER)	Target BER		
Block 3, Transmitting Terminal			
3a. Location Name	Geographic location of terminal (ie. Qatar; Erbil, Iraq; Kabal, Afghanistan, etc)		
3b. Terminal Id (Name/Number)	Terminal name or identifier (ie. WA-TFT, Swan, DKET, etc)		
3c. Uplink Frequency [GHz]	Tx uplink frequency of carrier		
3d. Latitude (plus for North) [deg]	Latitude of terminal		
3e. Longitude (plus for East) [deg]	Longitude of terminal		
3f. Elevation Angle [deg]	Look angle of terminal		
3g. Tx Dish Size [m]	Antenna size of terminal in meters		
3h. Uplink Tx EIRP@ Tx [dBW]	Uplink EIRP value of terminal		
3i. Satellite Footprint G/T @ Tx [dB/K]	Satellite G/T value for terminal location		
Block 4, Receiving Terminal			
4a. Location Name	Geographic location of terminal (ie. Qatar; Erbil, Iraq; Kabal, Afghanistan, etc)		
4b. Terminal Id (Name/Number)	Terminal name or identifier (ie. WA-TFT, Swan, DKET, etc)		
4c. Downlink Frequency [GHz]	Rx downlink frequency of carrier		
4d. Latitude (plus for North) [deg]	Latitude of terminal		
4e. Longitude (plus for East) [deg]	Longitude of terminal		
4f. Elevation Angle [deg]	Look angle of terminal		
4g. Rx Dish Size [m]	Antenna size of terminal in meters		
4h. G/T of Rx [dB/K]	Downlink G/T value of terminal		
4i. Satellite Footprint EIRP @ Rx [dBW]	Satellite EIRP value for terminal location		
Block 5, Uplink and Intermod			
5a. Carrier Output Backoff at Tx Earth Station [dB]	Difference between EIRP maximum and transmit power		
5b. Up Link Free Space Loss [dB]	Loss in signal strength of the uplink signal path through free space		
5c. C/No Uplink Total [dBHz]	Sum of all uplink losses, gains, and Boltzmann's constant		
5d. C/IMo Intermod [dBHz]	Ratio of average received modulated carrier power and combination of all interferences		
Block 6, Downlink			
6a. Carrier Output Backoff at Transmitting Transponder [dB]	Difference between satellite EIRP and the individual carrier power		

6b. Down Link Free Space Loss [dB]	Loss in signal strength of the downlink signal path through free space		
6c. C/No Downlink Total [dBHz]	Sum of all downlink losses, gains, and Boltzmann's constant		
6d. C/Io Interference [dBHz]	Ratio of average received modulated carrier power and combination of all interferences		
Block 7, Total (Uplink + Downlink + Intermod + Other Interference)			
7a. C/No Overall [dBHz]	Overall (uplink and downlink) ratio of carrier power over noise and all interferences.		
7b. System Link Margin (including Rain Model) [dB]	Difference between Required Eb/No and target Eb/No including margins to overcome rain fade and interference		
7c. Total Link Availability (end-to-end) [%]	Calculated availability based on ITU Rain Fade Models and interference		
7d. Required Thresh. Eb/No + Sys. Link Margin [dB]	Target Eb/No including margins to overcome rain fade and interference		
Block 8			
8a. Required Bandwidth [%]	Required percentage of transponder bandwidth to support proposed carrier		
8b. Required Bandwidth [MHz]	Required bandwidth in Mhz to support proposed carrier		
Block 9, Transponder Power Bandwidth Utilization			
9a. Required Power Equivalent BW (PEB) [%]	Required percentage of transponder PEB to support proposed carrier power		
9b. Required Power Equivalent BW (PEB) [MHz]	Required PEB in Mhz to support proposed carrier power		

LINK NAME	Sample Task Order #	DATE
Satellite & Carrier Characteristics		
1. Satellite Characteristics	2. Carrier Parameters	
1a. Satellite Name	2a. Data Rate (including "Overhead") [kbps]	
1b. Satellite Longitude (West/East) [deg]	2b. Modulation Scheme (BPSK, QPSK, 8PSK ... others)	
1c. Uplink/Downlink Beam	2c. Coding Type (Conv., Conv+RS, TPC, LDPC)	
1d. Transponder Id	2d. Inner Code Rate (FEC Rate/Code Rate)	
1e. Type of Band (C,Ku,C/Ku,Ku/C,X)	2e. Outer Code Rate (e.g. Reed/Solomon)	
1f. Xpdr Total Bandwidth [MHz]	2f. Rolloff Factor/Spacing Factor	
1g. UL Beam Polarization (V,H,L,R)	2g. Required Eb/No Threshold [dB]	
1h. DL Beam Polarization (V,H,L,R)	2h. Bit Error Rate (BER)	
1i. Xpdr SFD (@ 0 dbi/K G/T) [dBW/m2]		
Terminal Characteristics		
3. Transmitting Terminal Tx	4. Receiving Terminal Rx	
3a. Location Name	4a. Location Name	
3b. Terminal Id (Name/Number)	4b. Terminal Id (Name/Number)	
3c. Uplink Frequency [GHz]	4c. Downlink Frequency [GHz]	
3d. Latitude (plus for North) [deg]	4d. Latitude (plus for North) [deg]	
3e. Longitude (West/East) [deg]	4e. Longitude (West/East) [deg]	
3f. Elevation Angle [deg]	4f. Elevation Angle [deg]	
3g. Tx Dish Size [m]	4g. Rx Dish Size [m]	
3h. Uplink Tx EIRP@ Tx [dBW]	4h. G/T of Rx [dB/K]	
3i. Satellite Footprint G/T @ Tx [dB/K]	4i. Satellite Footprint EIRP @ Rx [dBW]	
Link Budgets (including Rain statistics)		
5. Uplink & Intermod	6. Downlink & Intermod	
5a. Carrier Output Backoff at Tx Earth Station [db]	6a. Carrier Output Backoff at Transmitting Transponder [dB]	
5b. Up Link Free Space Loss [dB]	6b. Down Link Free Space Loss [dB]	
5c. C/No Uplink Total [dBHz]	6c. C/No Downlink Total [dBHz]	
5d. C/(IMo Intermod + Io + X-Po) Uplink [dBHz]	6d. C/(IMo Intermod + Io + X-Po) Downlink [dBHz]	
7. Total (Uplink + Downlink + Intermod + Other Interference)		
7a. C/No Overall [dBHz]	7c.Total Link Availability (end-to-end) [%]	
7b. System Link Margin (including Rain Model) [dB]	7d. Required Thresh. Eb/No + Sys. Link Margin [dB]	
8. Transponder Bandwidth Utilization	9. Transponder Power Bandwidth Utilization	
8a. Required Bandwidth [%]	9a. Required Power Equivalent BW (PEB) [%]	
8b. Required Bandwidth [MHz]	9b. Required Power Equivalent BW (PEB) [MHz]	

Site A to Site B		STO # 1		29-Oct-15
Satellite & Carrier Characteristics				
1. Satellite Characteristics		2. Carrier Parameters		
1a. Satellite Name	E 70A	2a. Data Rate (including "Overhead") [kbps]	8192	
1b. Satellite Longitude (West/East) [deg]	116 E	2b. Modulation Scheme (BPSK, QPSK, 8PSK ... others)	QPSK	
1c. Uplink/Downlink Beam	Fixed	2c. Coding Type (Conv., Conv+RS, TPC, LDPC)	Conv+RS	
1d. Transponder Id	D1	2d. Inner Code Rate (FEC Rate/Code Rate)	0.875	
1e. Type of Band (C,Ku,C/Ku,Ku/C,X)	Ku	2e. Outer Code Rate (e.g. Reed/Solomon)	(219/201)	
1f. Xpdr Total Bandwidth [MHz]	72.00	2f. Rolloff Factor/Spacing Factor	1.35	
1i. UL Beam Polarization (V,H,L,R)	Y	2g. Required Eb/No Threshold [dB]	6.9	
1j. DL Beam Polarization (V,H,L,R)	X	2h. Bit Error Rate (BER)	1.0E-07	
1k. Xpdr SFD (@ 0 dBi/K G/T) [dBW/m2]	-78.00			
Terminal Characteristics				
3. Transmitting Terminal Tx		4. Receiving Terminal Rx		
3a. Location Name	Site A	4a. Location Name	Site B	
3b. Terminal Id (Name/Number)	OKET 13	4b. Terminal Id (Name/Number)	OKET 48	
3c. Uplink Frequency [GHz]	13.79167	4c. Downlink Frequency [GHz]	11.49167	
3d. Latitude (plus for North) [deg]	Numbers	4d. Latitude (plus for North) [deg]	Numbers	
3e. Longitude (West/East) [deg]	Numbers	4e. Longitude (West/East) [deg]	Numbers	
3f. Elevation Angle [deg]	53.63	4f. Elevation Angle [deg]	62.54	
3g. Tx Dish Size [m]	4.80	4g. Rx Dish Size [m]	3.80	
3h. Uplink Tx EIRP @ Tx [dBW]	62.34	4h. G/T of Rx [dB/K]	30.60	
3i. Satellite Footprint G/T @ Tx [dB/K]	3.50	4i. Satellite Footprint EIRP @ Rx [dBW]	40.50	
Link Budget with Included Rain Model				
5. Uplink		6. Downlink		
5.a. Carrier Output Backoff at Tx Earth Station [db]	18.58	6a. Carrier Output Backoff at Transmitting Transponder [dB]	13.88	
5b. Up Link Free Space Loss [dB]	206.56	6b. Down Link Free Space Loss [dB]	204.87	
5c. C/No Uplink Total [dBHz]	87.77	6c. C/No Downlink Total [dBHz]	80.94	
5d. C/(IMo+Io) Intermod + Interference [dBHz]	93.77	6d. C/(IMo+Io) Intermod + Interference [dBHz]	86.94	
7. Total (Uplink + Downlink + Intermod + Other Interference)				
7a. C/(No+IMo+Io) Overall [dBHz]	79.15	7c.Total Link Availability (end-to-end) [%]	99.929%	
7b. System Link Margin (including Rain Model)[dB]	3.12	7d. Required Threshold Eb/No + System Link Margin [dB]	10.02	
8. Transponder Bandwidth Utilization		9. Transponder Power Bandwidth Utilization		
8a. Required Bandwidth [%]	9.58%	9a. Required Power Equivalent BW (PEB) [%]	9.58%	
8b. Required Bandwidth [MHz]	6.900	9b. Required Power Equivalent BW (PEB) [MHz]	6.900	

Site B to Site A		STO # 1		29-Oct-15
Satellite & Carrier Characteristics				
1. Satellite Characteristics		2. Carrier Parameters		
1a. Satellite Name	E 70A	2a. Data Rate (including "Overhead") [kbps]	8192	
1b. Satellite Longitude (West/East) [deg]	116 E	2b. Modulation Scheme (BPSK, QPSK, 8PSK ... others)	QPSK	
1c. Uplink/Downlink Beam	Fixed	2c. Coding Type (Conv., Conv+RS, TPC, LDPC)	Conv+RS	
1d. Transponder Id	D1	2d. Inner Code Rate (FEC Rate/Code Rate)	0.875	
1e. Type of Band (C,Ku,C/Ku,Ku/C,X)	Ku	2e. Outer Code Rate (e.g. Reed/Solomon)	(219/201)	
1f. Xpdr Total Bandwidth [MHz]	72.00	2f. Rolloff Factor/Spacing Factor	1.35	
1i. UL Beam Polarization (V,H,L,R)	Y	2g. Required Eb/No Threshold [dB]	6.9	
1j. DL Beam Polarization (V,H,L,R)	X	2h. Bit Error Rate (BER)	1.0E-07	
1k. Xpdr SFD (@ 0 dBi/K G/T) [dBW/m2]	-78.00			
Terminal Characteristics				
3. Transmitting Terminal Tx		4. Receiving Terminal Rx		
3a. Location Name	Site B	4a. Location Name	Site A	
3b. Terminal Id (Name/Number)	OKET 48	4b. Terminal Id (Name/Number)	OKET 13	
3c. Uplink Frequency [GHz]	13.79167	4c. Downlink Frequency [GHz]	11.49167	
3d. Latitude (plus for North) [deg]	Numbers	4d. Latitude (plus for North) [deg]	Numbers	
3e. Longitude (West/East) [deg]	Numbers	4e. Longitude (West/East) [deg]	Numbers	
3f. Elevation Angle [deg]	62.54	4f. Elevation Angle [deg]	53.63	
3g. Tx Dish Size [m]	3.80	4g. Rx Dish Size [m]	4.80	
3h. Uplink Tx EIRP @ Tx [dBW]	63.00	4h. G/T of Rx [dB/K]	31.80	
3i. Satellite Footprint G/T @ Tx [dB/K]	-4.00	4i. Satellite Footprint EIRP @ Rx [dBW]	47.60	
Link Budget with Included Rain Model				
5. Uplink		6. Downlink		
5.a. Carrier Output Backoff at Tx Earth Station [db]	25.31	6a. Carrier Output Backoff at Transmitting Transponder [dB]	20.61	
5b. Up Link Free Space Loss [dB]	206.46	6b. Down Link Free Space Loss [dB]	204.98	
5c. C/No Uplink Total [dBHz]	81.04	6c. C/No Downlink Total [dBHz]	82.41	
5d. C/(IMo+Io) Intermod + Interference [dBHz]	87.04	6d. C/(IMo+Io) Intermod + Interference [dBHz]	88.41	
7. Total (Uplink + Downlink + Intermod + Other Interference)				
7a. C/(No+IMo+Io) Overall [dBHz]	77.69	7c.Total Link Availability (end-to-end) [%]	99.879%	
7b. System Link Margin (including Rain Model)[dB]	1.65	7d. Required Threshold Eb/No + System Link Margin [dB]	8.55	
8. Transponder Bandwidth Utilization		9. Transponder Power Bandwidth Utilization		
8a. Required Bandwidth [%]	9.58%	9a. Required Power Equivalent BW (PEB) [%]	2.03%	
8b. Required Bandwidth [MHz]	6.900	9b. Required Power Equivalent BW (PEB) [MHz]	1.465	

TDMA to worst case scenario		STO # 2	29-Oct-15
Satellite & Carrier Characteristics			
1. Satellite Characteristics		2. Carrier Parameters	
1a. Satellite Name	E 70A	2a. Data Rate (including "Overhead") [kbps]	2000
1b. Satellite Longitude (West/East) [deg]	116 E	2b. Modulation Scheme (BPSK, QPSK, 8PSK ... others)	QPSK
1c. Uplink/Downlink Beam	Fixed	2c. Coding Type (Conv., Conv+RS, TPC, LDPC)	LDPC
1d. Transponder Id	D1	2d. Inner Code Rate (FEC Rate/Code Rate)	0.500
1e. Type of Band (C,Ku,C/Ku,Ku/C,X)	Ku	2e. Outer Code Rate (e.g. Reed/Solomon)	1.00
1f. Xpdr Total Bandwidth [MHz]	72.00	2f. Rolloff Factor/Spacing Factor	1.35
1i. UL Beam Polarization (V,H,L,R)	Y	2g. Required Eb/No Threshold [dB]	1.7
1j. DL Beam Polarization (V,H,L,R)	X	2h. Bit Error Rate (BER)	1.0E-07
1k. Xpdr SFD (@ 0 dBi/K G/T) [dBW/m2]	-78.00		
Terminal Characteristics			
3. Transmitting Terminal Tx		4. Receiving Terminal Rx	
3a. Location Name	HUB	4a. Location Name	Spoke
3b. Terminal Id (Name/Number)	OKET 88	4b. Terminal Id (Name/Number)	OKET 99
3c. Uplink Frequency [GHz]	13.79167	4c. Downlink Frequency [GHz]	11.49167
3d. Latitude (plus for North) [deg]	Numbers	4d. Latitude (plus for North) [deg]	Numbers
3e. Longitude (West/East) [deg]	Numbers	4e. Longitude (West/East) [deg]	Numbers
3f. Elevation Angle [deg]	53.64	4f. Elevation Angle [deg]	53.64
3g. Tx Dish Size [m]	4.90	4g. Rx Dish Size [m]	1.50
3h. Uplink Tx EIRP @ Tx [dBW]	58.26	4h. G/T of Rx [dB/K]	23.00
3i. Satellite Footprint G/T @ Tx [dB/K]	3.50	4i. Satellite Footprint EIRP @ Rx [dBW]	47.60
Link Budget with Included Rain Model			
5. Uplink		6. Downlink	
5.a. Carrier Output Backoff at Tx Earth Station [db]	22.66	6a. Carrier Output Backoff at Transmitting Transponder [dB]	17.96
5b. Up Link Free Space Loss [dB]	206.56	6b. Down Link Free Space Loss [dB]	204.98
5c. C/No Uplink Total [dBHz]	83.70	6c. C/No Downlink Total [dBHz]	76.26
5d. C/(IMo+Io) Intermod + Interference [dBHz]	89.70	6d. C/(IMo+Io) Intermod + Interference [dBHz]	82.26
7. Total (Uplink + Downlink + Intermod + Other Interference)			
7a. C/(No+IMo+Io) Overall [dBHz]	74.57	7c. Total Link Availability (end-to-end) [%]	99.990%
7b. System Link Margin (including Rain Model)[dB]	9.86	7d. Required Threshold Eb/No + System Link Margin [dB]	11.56
8. Transponder Bandwidth Utilization		9. Transponder Power Bandwidth Utilization	
8a. Required Bandwidth [%]	3.75%	9a. Required Power Equivalent BW (PEB) [%]	3.75%
8b. Required Bandwidth [MHz]	2.700	9b. Required Power Equivalent BW (PEB) [MHz]	2.700