

Task Order Statement of Work (SOW)

Date: ~~November 14~~ August 31, 2020~~18~~

Task Name: **SCAN/ESC Technology Systems Engineering and Technical Services**

Task No. 56 / Mod: ~~75~~

Task Monitor (TM): ~~Kendall Mauldin~~ Jerry Mason (~~Telecomms Branch Head~~ TEMPO Deputy Chief, Code ~~566450.2~~)

Contract number: NNG15CR66C

Contract SOW Reference: Research and Technology Services

I. Scope

a. Background:

- i. In support of NASA's Space Communications and Navigation (SCaN) Advanced Communications and Navigation Technology Division (ACNT), the contractor shall provide systems engineering technical support services. The systems engineering projects on this task are ongoing in nature and will require close coordination with the TM to define and establish product specifications and schedules.
- ii. The systems engineering services on this task may include, but not be limited to the following:
 - Requirements research, analysis, and development
 - Technology research and trade analysis
 - Task management support and engineering implementation support
 - Provide subject matter expertise and technical writing recommendations
 - Provide programmatic and technical assessment and recommendations for classified discussions and studies at the TS/SCI
 - Assessment of the optical communications ground station expansion initiative
 - Assessment of the Technology Demonstration projects within ACN
 - Develop recommendations and supporting documents (e.g., reports, roadmaps, and briefings, etc.) for ACN division

b. Summary of work: Provide systems engineering services to the following known SCaN Projects

- i. Laser Communication Relay Demonstration
 - Assisting the LCRD Principal Investigator and LCRD team members to assess and recommended inputs for project documents and LCRD documents, such as experiment management documentation, an LCRD handbook, and make appropriate recommendations.
 - Support of all critical LCRD review activities
 - Fulfill requests for project management and systems engineering support on an as-needed basis

- ii. CCSDS Optical Communications Working Group
 - Assist working group members to provide recommended inputs to CCSDS books (technical standards, informational reports, etc.)
 - Provide recommendations to related technical assessments (e.g., atmospheric/weather analyses)
 - Provide working group support on an as-needed basis
- iii. SCA_N Testbed and Cognitive Communications Activities at GRC
 - Serve as direct interface between HQ and GRC on reviews, milestone activities, and regular reporting updates
- iv. Deep Space Optical Communications (w/STMD) at JPL
 - Serve as direct interface between HQ and JPL on reviews, milestone activities, and regular reporting updates
- v. Deep Space Atomic Clock at JPL
 - Serving as direct interface between HQ and JPL on reviews, milestone activities, and regular reporting updates
- vi. Optical Communications ground station expansion initiative in partnership with NASA GSFC
 - Assess site selection and environmental impacts
 - Recommendation and implementation of atmospheric instrumentation
 - Coordination with local authorities for site permits and approvals
 - Provide HQ updates on reviews and milestone activities
- vii. Development of Future LEO Optical Communications Terminal
 - Coordination with Goddard Space Flight Center (GSFC), Lincoln Labs, and partner agencies as needed
 - Participation in meeting related to the NG LEO terminal
 - Documentation recommendations and technical analysis as needed
- ~~viii. Development of Next Generation Optical Communications Relay Satellite~~
 - ~~- Coordination with Goddard Space Flight Center (GSFC), Lincoln Labs, and partner agencies as needed~~
 - ~~- Participation in meeting related to the NG Relay Satellite~~
 - ~~- Documentation recommendations and technical analysis as needed~~
- ix. Delay Tolerant Networking (DTN) development
 - Identification/recommendation of public-facing content on DTN development
 - Participation in regularly-held coordination meetings within SCA_N's DTN development group
 - Tracking of SCA_N's progress against DTN-related action items and milestones
 - Attendance at the semi-annual DTN Face-to-face
- x. Development of HQ MOU/MOAs
 - Develop schedule and plans for any MOAs or MOUs with outside organizations needed for HQ projects at the ACN Director's request
 - Attend classified meetings in SCI facilities and recommended documentation of technical and programmatic decisions made at meetings

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- Develop briefings and report recommendations at the SCI level, and have access to communication via JWICS with program participants
- xi. Optical Communications weather and atmospheric research in partnership with GSFC and JPL
 - Provide recommendations from NASA centers and Headquarters contractors
 - Technical assessments for ACN management
 - Participate in technical and programmatic meetings, and producing recommended schedules and documentation
- xii. The Subcontractor shall also fulfill requests for systems engineering technical assistance on an as-needed basis as directed by SCaN Management.
- c. Special Research and Product Support Services
 - i. Shall deliver results of special research projects and product support services per the schedule negotiated with the TM.

II. Period of Performance

The period during which the work for this task order shall be performed is from ~~January 01 Aug 31st, 2020~~ through ~~October 14 April 14th, 2021~~.

III. Subtask Description *No Subtasks*

IV. Deliverables/Schedules/Milestones

The subcontractor shall report status in person or via teleconference to the TM or designated alternates on a monthly basis. Reports shall include informal presentation of interim results, status of development activities, and action item status. The subcontractor shall provide all reports at least one day in advance of the monthly meeting via email and maintain an email distribution list with the concurrence of the TM. The subcontractor shall also support the TM in the preparation of status reviews for internal and external funding agencies. The subcontractor shall comply with any and all additional requests for status meetings and reports.

Item	Due Date
Kickoff meeting	ATP + 7 days
Final Out brief and Lessons Learned	ATP + 305 days
Monthly Progress Reports	5 th of the Month
Financial 533 Reports	Monthly*
Final Task Report	15 days before the end of the task

*MARs to be submitted in accordance with the deliverables requirements specified in the SEAS Contract document.

V. **QA Requirements**

The subcontractor providing technical services shall comply with all CMMI Level 2 processes established for the Project and deliverable products. Applicable requirements include, but not limited to Section II, Applicable Documents.

VI. **Management Approach**

a. **Staff Allocation, Expertise, and Skill Mix**

The subcontractor shall staff this work item with the appropriate skill mix and staffing level for the work.

b. **Configuration Management**

Systems and documents will be covered under the ESC Code 450 Configuration Management Plan.

c. **Facilities**

Appropriate IT devices to support the analyses, specification development, and report development are required. It shall be the subcontractor's responsibility to provide and set up local workstations and network connections at the subcontractor's off-site facilities as required, and to install any required tools and utilities on the subcontractor's equipment.

d. **Risk Management and Best Practices**

The subcontractor shall manage schedule, cost, and technical risk through monitoring and reporting of progress and performance metrics, identifying issues well in advance of negative consequences, recommending corrective action to the TM, and implementing corrective actions with the compliance of the TM.

e. **Performance Metrics**

The work performed for this task will be evaluated by the TM based on the technical merit. Technical evaluation of the task performance is a subjective combination of performance metrics, technical quality of deliverables, cost control, significant events, innovations and meeting requirements set forth in the SOW.

- f. Government Furnished Facilities, Equipment, Software and Other Resources
The Government will provide account and passwords to government-furnished workstations where existing versions of various relevant software packages shall be maintained. It shall be the subcontractor’s responsibility to complete any GSFC required security-related training courses.

VI. Safety

Safety Course Title	SATERN Course Number	Frequency
<i>Personnel Performing Work at GSFC:</i>		
Flashpoint: Recognizing and Preventing Workplace Violence	GSFC-FP-WPV	Initial Only
GSFC-Hazard Communication Training Program	GSFC-SH-HAZCOM13	Every 3 Years
GSFC-Building Emergency Plan (BEP)	GSFC-SH-BEP12	Annually
GSFC-Environmental Awareness Training	GSFC-SH-EAT14	Every 3 Years

VII. Training and Certification Requirements

The Subcontractor shall adhere to a SEAS requirement to report all training and certification efforts accomplished – whether required or electively chosen - by personnel supporting this task. The subcontractor will report status as a deliverable requirement on the Monthly (Technical) progress report. See Section 1.6 Deliverables on the Task Plan.

VIII. ITAR and Export Control

Export control procedures are not expected to be required for this task at this time based on the Statement of Work.

IX. Security Requirements

The subcontractor shall comply with Information Technology Security procedures and requirements as defined by NPG 2810.1A in the performance of

this task. In addition, the subcontractor shall comply with all applicable federal rules and regulations and agency directives.

X. Organizational Conflict of Interest

Although ATS has no known OCI issues on this task, the subcontractor shall identify any anticipated OCI issues expected for this effort in the task plan.

XI. Data Rights

This SOW shall adhere to the following Data Rights clause, as stated in this contract: “the default Data Rights clause under this contract is FAR 52.227-14 RIGHTS IN DATA-GENERAL as modified by NASA FAR Supplement 1852.227-14-Alternate II and Alternate III and GSFC 52.227-90. Any exceptions to this clause will be covered by FAR 52.227-17 RIGHTS IN DATA-SPECIAL WORKS as modified by NASA FAR Supplement 1852.227-17, and, if applicable, GSFC 52-227.93.”

I. ODC (Travel and Procurement)

The Advanced Communications and Navigations division is also in need of support that will include domestic and international travel to support face-to-face meetings as necessary for the tasks listed above. For the period of performance extending October 14, 2020, this will include 6 domestic trips and 1 international trip, as listed below. Travel estimates are fully loaded; the contractor will provide unsanitized travel cost to the CO upon request. Travel shall be in accordance with and FAR 31.205-46 “Travel Costs”, as applicable.

Destination	Travel Dates	Purpose
Marshall Space Flight Center – Huntsville, AL	May 2020 / 5 days	Spring CCSDS face-to-face meeting
Glenn Research Center – Cleveland, OH	July 2020 / 3 days	GRC Technology Review
Goddard Space Flight Center – Greenbelt, MD	July 2020 / 2 days	GSFC Technology Review
Jet Propulsion Laboratory – Pasadena, CA	July 2020 / 3 days	JPL Technology Review
NASA Headquarters – Washington, DC	September 2020 / 3 days	SCaN Quarterly Program Manager’s Review
MIT/Lincoln Laboratory – Lexington, MA	September 2020 / 2 days	Quarterly Program Manager’s Review
Toulouse, France	October 2020 / 5 days	Fall CCSDS face-to-face meeting

II. Work Location

This work shall be performed partially at the Goddard Space Flight Center and NASA Headquarters (On-site), but the contractor may be required to perform some work at the contractor's facility (Off-site).