

Task Order Statement of Work (SOW)

This mod is for extension of the period of performance from 11/18/19 to 11/17/20. Note that Subtask 1 has ended and no further effort is needed. The original SOW and Mod 1 SOW (addition of Subtask 2) are included below for completeness.

Date: 10/25/19

Task Name: Task 35 SOW for Systems Engineering and Other Support

Task No. 35/ Mod: 02

Period of Performance: 11/18/19 to 11/17/20

Contract number: NNG14WA48C

The requested systems engineering work effort is broad in scope and covers a wide range of professional products and services associated with several specific technical development areas. The scope covers development, procurement, documentation, reviews, testing, and post mission reporting. The support is broad in scope and is an effort to assist in new project development. These efforts include, but are not limited to:

1. Provide systems engineering expertise to the assigned project teams.
2. Generate, compile information, and track interface control information.
3. Provide Configuration Management and documentation support.
4. Conduct and/or interpret reliability assessments for component, subsystems and/or systems.
5. Establish and track requirements/verification traceability at system and subsystem level.
6. Develop and maintain verification plans.
7. Participate in integration and testing.
8. Verify compliance of system/subsystem verification plans to system requirements.
9. Participate, lead, and/or give presentations during reviews and other project related meetings.
10. Support discipline engineering team in accomplishing design, build, and testing decisions.
11. Act as the Lead Systems Engineer for projects as assigned.
12. Generate a Systems Engineering Management Plan (SEMP) as required.
13. Provide input on, and review of, project systems engineering and lifecycle costing.

Due to the length of the support, the detailed summary of work will be updated at each milestone. Various subtasks will be created to delineate budget and cost funding and the supporting organization. Some travel is anticipated. Purchase of hardware/equipment may be required.

Period of Performance

The predicted period of the work is from November 18, 2019 through November 17, 2020.

General Deliverables

Monthly Progress Reports in accordance with clause B1 and C2, and weekly status report for active projects will be delivered on the listed due date.

Task Deliverable Items	Due Date
Monthly Progress Report (Each Subtask)	15 th of each month
Monthly 533	Monthly, 5th business day following last Sunday of the month (2)

Subtask 1 – Air Force Motor Certification (AFMC) - ENDED

Provide systems engineering support for the AFMC project. The contractor will support the project lead SE with the following, in line with the project schedule:

- Generate a Systems Engineering Management Plan (SEMP).
- Establish level 1 through level 3 requirements, perform requirement flow downs and provide requirements traceability at a system and subsystem level.
- Develop and maintain a verification plan with established verification methods, as defined in the SEMF.

Subtask 2 – Code 840 Range and Mission Management SE work

1. Scope

a. Subtask 2 Description

The purpose of this subtask (subtask 02) is to provide Systems Engineering support for engineering disciplines in support of Code 598 GNC – including support for Code 840 Range and Mission Management Office. The intent is that this task will be modified to allow additional work elements to be added as required by new projects identified by Code 598 / Code 840.

Summary of the work elements:

- 00 – Systems Engineering support for Codes 598 and 840 (POP thru 11/17/2020)
- 01 – Optical Systems Engineering, KTM Optics (POP thru 11/30/2019) ENDED
- 02 – Technical Writing support (POP thru 11/17/2020)

b. Summary of Work

Work Element 00, WSSEB Support:

Codes 598 and 840, GNC and RMMO respectively, seeks Systems Engineering and Technical support for Systems Engineering, including systems planning, conceptualization, requirements definition and analysis, design, implementation, testing, installation, verification and validation, operations, and configuration management for ground and flight systems, sub-systems, and/or data systems.

- Periodic travel may be required in support of various tasks and/or missions. These can range from day trips to the Goddard campus to lengthier trips in support of mission/project specific tasks off-site. However, there is currently no known travel during this performance period. All travel shall be approved by the task monitor and/or project manager.
- Procurements of test equipment, lab materials, and task specific software and hardware may be required.
- Training (and any subsequent travel) is allowed following approval by the task monitor and/or RMMO project manager.

Work Element 01, Optical Systems Engineering, KTM Optics:

Contractor shall provide systems engineering support in the specification and acquisition of optical systems (cameras and lenses) for mobile optical tracking mounts (Kineto Tracking Mounts (2) currently in the RMMO mobile range inventory. KTM's will be in the process of being refurbished on a separate effort.

The contractor shall work on a project team led by RMMO in conjunction with the RMMO Range Operations Contractor (operator of objective system), WFF 500 Engineering, and other participants as identified.

The contractor shall:

- Support the Range in development of operational requirements, characterization of expected optical systems performance and capabilities.
- Evaluate, select, and propose camera and lens configurations to best leverage tracking options at low and high altitudes.
- Identify options and trades in approaches for acquisition of KTM Optical systems.
- Explore and evaluate candidate systems for IR "high-speed" tracking camera options.
- Identify integration requirements and support development of the integration approach with the KTM tracking mounts and Range IP Video Distribution System (and other Range system interfaces as identified).

The contractor shall provide the following deliverables:

- Weekly report to the Task Monitor as well as the RMMO Project Manager
- Monthly Status Report to the Task Monitor as well as the RMMO Project Manager
- Implementation/Project Plan for Optical Sub-system
 - Plan of Action / Milestones Schedule
 - Optical System Requirements Document

- Optical Requirements Review Presentation / Charts
- Technical Trade Study including Report
- System Acquisition SOW
- Engineering Test Plan and Report(s)
- Technical content for KTM/Optical Systems Reviews
 - Design Review
 - Integration & Test Readiness Review
 - Operational Readiness Review

Work Element 02, Technical Writing and Training Development Support:

The contractor shall provide technical writing support for Codes 598 and 840. The scope of work includes technical drawings, training documents, user's guides, operational manuals, engineering project documentation, project schedules, systems drawings and/or technical plans, or other documentation as assigned. The contractor shall develop and coordinate implementation / delivery of customized Range Systems Technical Training classes (including working with commercially available vendors in the customization of existing training and/or development of new training materials based on content provided by the RMMO).

2. Period of Performance

Period of performance is from August 15, 2019 thru November 30, 2019.

3. Deliverables/Schedules/Milestones/ (Specifically required for this task)

The contractor shall provide a weekly report to the Task Monitor as well as the RMMO Project Manager.

The contractor shall provide a monthly status report for the overall task in accordance with contract requirements.

4. Place of Performance

This work shall be performed on-site at the Wallops Flight Facility.

5. Special Requirements/Other Comments

The contractor shall ensure all NASA required safety protocols are followed and all safety training is up-to-date. This includes but is not limited to electro-static discharge (ESD) or other specific training required for the work outlined.

Approval via email from the technical Point of Contact (POC) must be obtained prior to subtask approval in TOMS. The POC's for Subtask 2 are:

Work Element 00: Doug Voss/840

Work Element 01: John Waterfield/598

Work Element 02: Doug Voss/840