Task Order Statement of Work (SOW)

Date: August 27, 2020
Task Name: GEOCARB Instrument Systems Engineering
Task No. / Mod: 128/2
Task Monitor (TM): Adam Matuszewski
Contract number: NNG15CR66C
Contract SOW Reference:

Task Mod Summary: 1) Extend end date from Oct 15, 2020 to April 14, 2021, 2) Change TM from Dennis Dillman to Adam Matuszewski. No change in scope.

I. Scope

II. The GeoCarb Mission is designed to collect observations of the column averaged concentrations of carbon dioxide (CO2), methane (CH4), and carbon monoxide (CO), and solar induced fluorescence (SIF) from geostationary orbit (GEO) at a spatial resolution of 5-10 km over the Americas between 55º North and 55º South Latitudes while hosted on a commercial communication satellite in orbit near 85º West longitude. GeoCarb was assigned to the Goddard Spaceflight Center while already at a CDR-level-of-maturity.

III. The Goal of the GeoCarb Mission is to provide observations and demonstrate methods to realize a transformational advance in our scientific understanding of the global carbon cycle.

a. Summary of work – The contractor shall provide an Instrument Systems Engineer to perform the following:

Task initiation through approximately July, 2020:

1. Technical review of existing GeoCarb requirements and documentation to determine if/how they conform to GSFC standards and practices. Disposition changes or waivers (with associated risk) for nonconformities.
2. Assess and update technical risks with the results of #1 above. Advise the GeoCarb Project Manager and Technical Authority on risk posture.

3. Define how to inject GSFC into Level 2 and Level 3 requirements verification buyoffs.
4. Define support required from GSFC engineering disciplines to support the above activities.
5. Prepare for CDR Part II.

July, 2020 through completion of task: Provide technical leadership to the GeoCarb project, by performing the following duties:

1. Verification and Validation Support for the following:
    a. Prepare and/or review hardware and software integration plans and procedures.
    b. Prepare and/or review detailed functional, comprehensive, and environmental test plans and procedures.
    c. Ensure execution of integration and test plans.

2. Environmental Requirements: Define, review, and analyze GEOCARB's specifications for:
    a. Thermal Vacuum
    b. Grounding
    c. EMI/EMC testing
    d. Contmination Control
    e. Vibration
    f. Acoustic
3. Risk Analysis, Reduction, and Management:
    a. Develop and implement contingency plans for controlling high risk elements in the test program
    b. Proivide comment to and alternate approaches for current risk management plans.
    c. Lead the GeoCarb Risk Management Board.
4. Configuration Management and Documentation:
    a. Lead major anomaly resolutions. Develop insight into minor anomaly resolutions.
    b. Define how GSFC configuration management will work with existing GeoCarb configuration management
    c. Lead the effort to insure that appropriate (for Class D) technical documentation is generated and submitted per NPR's 7120.5 and 7123.1.
5. Integration, Test, and Verification
    a. Provide instrument engineering support to advise on integrating and verifying the flight GEOCARB instrument, ground, and data systems.

b. Oversee development, modification, and execution of test plans and procedures.

c. Assist SMA in documenting non-conformances are documented and dispositions.

d. Assist with the development of operating manuals and reference documents

6. Review leadership

a. Lead and coordinate the technical portions of the remaining lifecycle GeoCarb reviews among NASA, the PI organization, and the contractor.

b. Chair peer reviews as needed to penetrate specific technical issues or subsystems.

b. Required skills/knowledge – The contractor shall have the following knowledge skills mix to evaluate the below areas:

1. Developing, testing, and delivering of a space flight science instrument
2. Contamination control for IR optics and spaceflight hardware
3. Electrostatic control and mitigation
4. Electro magnetic testing of flight hardware
5. Vibration and acoustic testing of flight hardware
6. Leading mutli-disciplinary teams
7. Coordinating between test facilities and instrument teams
8. Scheduling and budgeting for flight instruments
9. Purchasing of flight hardware and test equipment
10. Mishap response
11. Mishap investigation
12. Documentation review for adherence to ITAR/EAR
13. ITAR/EAR instrument assessment
14. Instrument Management

IV. Period of Performance

The Period of Performance is from Oct 14, 2020 through April 14, 2021.

V. Subtask Description

No Subtasks.

VI. Deliverables/Schedules/Milestones

Ref#	*Deliverables*	*Due Date*
1	Weekly Status Reports	Weekly
2	Monthly Progress Report	Monthly
3	End-of-task Report	End of task

VII. Management Approach

a. Staff Allocation, Expertise, and Skill Mix

The contractor 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 Project Configuration Management Plan.

c. Facilities

N/A

d. Risk Management and Best Practices

N/A

e. Performance Metrics

N/A

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 contractor's responsibility to complete any GSFC required security-related training courses.

g. Quality Assurance Requirements

[If As Required]

VIII. ODC (Travel and Procurement)

Travel may be proposed for special training needs and other engineering support task activities as directed by the Project. This could include, but is not limited to, the following:

- 11 domestic trips to vendor facilities to support the instrument/mission in conducting crucial subsystem reviews, procurement reviews, Technical Interface Meetings (TIMs), and inspections.
- 8 domestic trips to University facilities to support the instrument/mission in conducting crucial instrument and subsystem reviews, Technical Interchange Meetings (TIMs), and inspections.
- Travel is expected to consist of a Monday Departure and Friday return

Location	*Duration*	*Dates*
Palo Alto CA	*1 week*	*Monthly Jan 2021 through end of PoP*
Norman, OK	*1 week*	*Once in Spring 2021*

IX. Work Location

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

X. Reporting Requirements

a. Weekly status report

The contractor shall generate Performance Reports every week. The report shall include, as a minimum, a summary of the weeks highlights/accomplishments, milestones/schedule/deliverables, risks and customer meetings.

b. Monthly performance report

The contractor shall provide monthly technical and schedule progress reporting to adequately describe the activities of the contractor team to the TM. The contractor shall provide monthly cost reporting in accordance with the WBS. The contractor, including subcontractors, shall be available to attend monthly status meetings.

XI. Security Requirements

The contractor shall comply with Information Technology Security procedures and requirements
as defined by NPR 2810.1A in the performance of this task. In addition, the contractor shall comply with all applicable federal rules and regulations and agency directives.
The Contractor shall adhere to project requirements regarding ITAR related information, as controlled by the ITAR, 22 CFR 120-130, by the U.S. Department of State. Any transfer of controlled information to a foreign person or entity requires an export license issued by the U.S.
Department of State or an ITAR exemption to the license requirement prior to the export or transfer.

XII. Data Rights

This SOW shall adhere to all Data Rights Clauses as stated in the SEAS II contract.

XIII. Applicable Documents

1. TBD

XIV. References

N/A