Wallops Engineering Services Contract II (WESC-II)

NNG14WA48C

The Terms and Conditions of the basic Contract automatically flow down into each task order and shall not be repeated in a task order to avoid potential inconsistencies and conflict

Task Order Statement of Work (SOW)

Date: 9/4/2020
Task Name: Coronal Diagnostic Experiment (CODEX)
Task No. / Mod: 41/ 2
Contract number: NNG14WA48C

Modification 2:
This modification will reorganize the Subtask to match the contract Subtask numbering. This modification will also create a second Mechanical Engineer position within Subtask 02.

Modification 1:
This is a labor category modification. The proposed work will not change.
.

1. **Scope**

A. Background

The Coronal Diagnostic Experiment (CODEX) project is a scientific payload designed to study Coronal Mass Ejections in greater depth. CODEX is a Flight Releasable Attachment Mechanism (FRAM) based payload that will be delivered to the International Space Station (ISS) by a yet to be determined Commercial Resupply Services (CRS) mission. CODEX is planned to launch in the winter of 2022.

B. Detailed Summary of Work

GENERAL REQUIREMENTS

Provide design, drafting, integration, test, procurement and mechanical technician support associated with the CODEX mission. Subtasks will be used to identify the period of performance for each element of the general task.

TASK REQUIREMENTS

Subtask 01 CAD (Computer Aided Design)

MOD 2 - No Change

MOD 1 - No Change, labor category modification only

The contractor shall provide services to create design models using CAD support software. CODEX will use Dassault Systems-SolidWorks for all design and drafting elements related to the CODEX mission. Support is required for 3D model development and to create technical drawings for fabrication and installation of the design models. Fabrication requirements will be met by creating paper drawings, drafting files, or CAD models (.step, .iges, etc) to be used by manufacturing as necessary. Models shall be created using drawing numbers created and maintained by NASA applying standard mechanical design and Configuration Management (CM) practices. Drafting of drawings should be in accordance with 500-PG-8700.2.5, Engineering Drawings Requirements Manual but may vary depending on project management decisions.
CAD tasks will include but are not limited to:

- Preliminary and detailed part and assembly files
- Create electronic drawing files in accordance with 500-PG-8700.2.5
- Working with the PTC-Windchill for configuration management
- Check drawing for completeness and adherence to 500-PG-8700.2.5
- Provide feedback on designs and procedures based on previous experience with ISS payload, GSFC Integration and Test (I&T), GSFC Contamination, and GSFC Safety.
- Travel required to support scheduled I&T efforts at GSFC and launch preparation at KSC

CAD support will be required to prepare for PDR and CDR. This task will require design, drafting, and checker skills to support preliminary and detailed designs of flight hardware and GSE. The period of performance for this subtask is: April 20, 2020 until April 19, 2021. The place of performance for this subtask is on-site at WFF but can be done remotely. Some travel expected to WFF and other locations as required. Expected travel is 2-day trips between WFF and GFSC, monthly for the full period of performance. PDR and CDR are scheduled for June 2020 and February 2021 respectively. There are no ODC’s planned for this subtask.

Subtask 02 Mechanical Engineering

MOD 2 – Add second Mechanical Engineer.

Mechanical Engineering support will be required to support from post preliminary design through CDR action item closeout. The period of performance for this subtask is: Sept 28, 2020 until April 19, 2021. The tasks to be performed will include, but are not limited to, design of flight structures, flight electronics enclosures, MGSE, and writing test procedures. The mechanical engineer(s) will work closely with PDL, drafter, and other engineers. The place of performance for this subtask is on-site at WFF but can be done remotely. Some travel expected to WFF and other locations as required. Expected travel is 2-day trips between WFF and GFSC, monthly for the full period of performance. CDR is scheduled for February 2021. There are no ODC's planned for this subtask.

Mechanical Engineering support shall be required for CODEX payload design and integration. The Mechanical Engineer(s) shall perform mechanical design studies, detailed designs including drawings for manufacturing and installation, documented stress analysis, and presentations at NASA reviews for the payload and required Ground Support Equipment (GSE). Designs require compliance with ISS payload requirements for attached external ISS payloads and launch vehicle requirements for payloads. The engineer(s) shall work closely with the Mechanical Project Design Lead (PDL) and Systems Engineer to ensure all payload and GSE requirements are met. Previous ISS payload experience is desirable. The preferred Computer Aided Design (CAD) software for the project is Solidworks. The preferred Finite Element Method (FEM) software is MSC-NASTRAN.

- Yoke and Platform compete design peer review one month from start date
- Flight PSU Box Analysis two months before CDR
- Flight Auxiliary Box Analysis two months before CDR
- Box Mounting Analysis two months before CDR
- CDR action item closeout one month post CDR

MOD 1 - No Change, labor category modification only

Mechanical Engineering support shall be required for CODEX payload design and integration. The Mechanical Engineer(s) shall perform mechanical design studies, detailed designs including drawings for manufacturing and installation, documented stress analysis, and presentations at NASA reviews for the payload and required Ground Support Equipment (GSE). Designs require compliance with

ISS payload requirements for attached external ISS payloads and launch vehicle requirements for payloads. The engineer(s) shall work closely with the Mechanical Project Design Lead (PDL) and Systems Engineer to ensure all payload and GSE requirements are met. Previous ISS payload experience is desirable. The preferred Computer Aided Design (CAD) software for the project is Solidworks. The preferred Finite Element Method (FEM) software is MSC-NASTRAN.

Mechanical Engineering support will be required to support from preliminary design through CDR action item closeout. The period of performance for this subtask is: April 20, 2020 until April 19, 2021. The task will include but are not limited to design of flight structures, flight electronics enclosures, MGSE, and writing test procedures. The mechanical engineer with work closely with PDL, drafter, and other engineers. The place of performance for this subtask is on-site at WFF but can be done remotely. Some travel expected to WFF and other locations as required. Expected travel is 2-day trips between WFF and GFSC, monthly for the full period of performance. PDR and CDR are scheduled for June 2020 and February 2021 respectively. There are no ODC's planned for this subtask.

Subtask 03 Mechanical Technician Engineering

MOD 2 - No Change

MOD 1 - No Change, labor category modification only

Mechanical Technician support shall be required for CODEX fabrication, sub-assembly, integration, and test. The Mechanical Technician shall work closely with Engineering to support detailed designs, components assembly, sub-assemblies, and final integration and test of the CODEX mission. Mechanical Technician shall follow all work orders and procedures while working with Quality Assurance and Engineering. The Mechanical Technician should have previous experience with ISS payloads and GSFC testing. The period of performance for this subtask is: April 20, 2020 until April 19, 2021.

Mechanical Technician tasks will include but are not limited to:

- Assembly of components, sub-assemblies, Ground Support Equipment (GSE) and flight hardware
- Handling of Electrostatic Discharge (ESD) sensitive components
- Handling of flight hardware
- Critical lift operations
- Forklift operations

- Use of mill, lathe, CNC, and other fabrication equipment
- Work in and maintain level 10K clean room
- Support integration and test at Wallops and Greenbelt Facilities.
- Travel required to support scheduled I&T efforts at GSFC and launch preparation at KSC

Procurement

Procurement and fabrication of hardware shall be performed by the contractor. This shall include but not be limited to all fabricated and machined parts, fasteners, coatings, gaskets and off the shelf products necessary to complete the development payload, GSE, and Integration & Test (I&T) CODEX payload and its parts.

2. **Period of Performance**

MOD 2 - No Change

MOD 1 - No Change, labor category modification only

Period of performance is detailed in each subtask.

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

MOD 2 - No Change

MOD 1 - No Change, labor category modification only

Details of the specific deliverables are presented below.

Status Updates/Progress Reports

The contractor shall report status in person or via teleconference to the TM or designated alternates on a biweekly basis. Reports shall include informal presentation of interim results, status of development activities, action item status and status of progress and issues. The contractor shall provide all reports at least one day in advance of the monthly

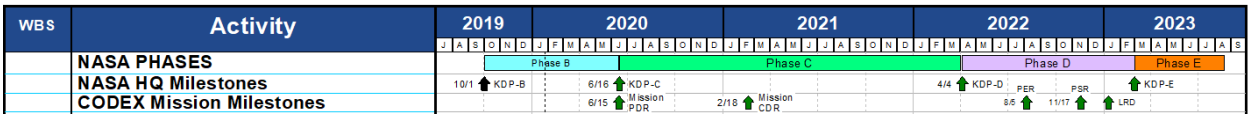
meeting. The contractor shall also support the TM in the preparation of status reviews for internal and external funding agencies.

Documentation

The following deliverables shall be complete and provided to NASA prior to the end of the period of performance:

- Drawings
  - Installation Drawings
  - Manufacturing Drawings
- CAD
  - All native CAD files
- Complete Work Orders and Procedures

Schedule



4.Place of Performance

MOD 2 - No Change

MOD 1 - No Change, labor category modification only

This work shall be performed on-site at the Wallops Flight Facility and at the sites designated by the sub-tasks.

5.Special Requirements/Other Comments

MOD 2 - No Change

MOD 1 - No Change, labor category modification only