

STATEMENT OF WORK

The vendor shall provide the necessary labor, materials, software, facilities and personnel to develop, test, integrate and deliver one 3U or 6U CubeSats (also known as “Vehicle”).

In the performance of this effort, the Contract shall:

1.0 Payload Accommodation

1.1 Accommodate a TBD payload, with form factor of TBD-U, power consumption of no more than TBD watts and mass of no more than TBD grams

1.2 Have capability or be able to accommodate a deployable antenna, Solar Arrays and TBD deployment system with mass of no more than TBD grams

1.3 Provide a TBD interface between the vehicle and the payload for command and data.

1.4 Provide unregulated/regulated TBD Volt DC power source to the payload

2.0 Vehicle Capabilities

2.1 Limit the vehicle radiated emissions in the TBD-TBD MHz frequency region to less than TBD uv/meter.

2.2 The battery shall be sized to maintain a stable thermal environment for the vehicle, while vehicle enters and exits eclipses typical for a TBD minute LEO orbit

2.3 Keep the payload in the temperature range of -TBD degrees C to +TBD degrees C at all times.

2.4 Provide onboard non-volatile data storage of at least TBD Gbits

2.5 Provide nominal pointing accuracy of better than TBD degree, 3 sigma, at the ADCS reference location

2.6 Provide TBD-band downlink capability of minimum TBD Mbps from the vehicle

2.7 The telecommunication system shall be compatible with TBD format

2.8 The telecommunication system shall be compatible with TBD Encryption format

2.9 The vehicles shall be capable of surviving at minimum TBD months, in the typical LEO radiation environment

2.10 Provide shipping containers to transport the vehicles from contractor’s location to TBD location, as specified by the customer.

3.0 GFE Equipment

3.1 TBD

4.0 Testbed and Analysis

4.1 Provide a testbed that simulates the Avionics interface of the vehicle to the payload for payload command and data interface verification.

4.1.1 Testbed may remain at the vendor facility or be delivered to the instrument provider.

4.2 Provide on-orbit thermal analysis report of the vehicle with a thermal model of payload, as provided by instrument developer, integrated into the vehicle model.

5.0 Mission Assurance

5.1 Provide a SC integration flow and schedule and allow customer QA two inspections during integration phase

5.1.1 Operate the vehicles for 200 hours in the Power On mode prior to delivery to customer

5.2 Allow customer Subject Matter Experts (SME) to participate in and witness all test set ups and test activities, which will be conducted at the vendor

5.3 Provide EEE Parts radiation risk assessment for catastrophic events (SEL, SEGR, SET, etc, but not for TID or DDD)

5.4 Allow customer to provide QA oversight for environment test set up and inspection of final product.

5.5 Perform Environmental tests per JPL Environmental Requirements Document. JPL will also provide the TBD specification for a baseline functional test to be performed before and after each environmental test. The environmental tests include:

- Thermal Vac – high/lo 3 x Test will be conducted to Flight Allowable Temp + some positive margin (5-10 degrees)
- EMI/EMC
- Vibration

5.6 Provide Environmental Test Plans and Test Procedures for each test two weeks prior to testing

5.7 Provide an EMI/EMC characterization test report of a prototype vehicle, which is similar to the planned delivered vehicles. This test shall be conducted in an EMI/EMC chamber.

5.8 Provide an EMI/EMC characterization test report of a fully integrated vehicle, including JPL flight payload and a test antenna. This test shall be conducted in an EMI/EMC chamber.

5.9 Provide test reports following each stage of environmental testing.

5.10 Provide Test Plans and Procedures for verification of nominal vehicle performance, including but not limited to verification of mass properties, ability to close the communication loop from the payload to the ground station, and ability to close all of the control loops and maintain a stable 3-axis attitude. Verified GSE and verified simulations may be used, if appropriate.

5.11 Provide materials Radiation impact assessment

5.12 Provide a list of all anomalies occurred during performance and environmental testing. The list will include a) description of the anomaly, b) cause of the failure and c) the corrective actions.

6.0 Reporting & Documentation

6.1 Deliver a fully integrated vehicle to customer following an Approved Delivery Review process.

6.1.1 Optionally customer may deliver the instrument(s) to the vendor for integration and test. In that case, the vendor will deliver a fully integrated to TBD location following Approved Delivery Review process.

6.4 Provide an End-Item-Data Package (EIDP), including all of the test plans, test results and appropriate sections of paragraph 5.0, pictures taken and a full description of flight software following the delivery of flight vehicles.

6.5 Provide a command and telemetry dictionary to describe all of the allowable commands that can be sent to the vehicle and all the telemetry available to assess vehicle health/safety and performance levels.

6.6 Provide a User's Manual to assist with the independent operation of the vehicles by the customer

6.7 Allow for possibility of a labor contract extension beyond delivery date, if support is required during the operation of vehicle in space

6.8 Support weekly tag-up and status of work telecoms no more than 1 (one) hour per week.

6.9 Provide monthly written status of work via e-mail to the CTM, including financial information

6.10 Provide Delivery Milestone schedule