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Rapid Acquisition of a Small Rocket (RASR) Statement of Work (SOW) for NRO/OSL Launch Services

8 December 2019

1. Background

The National Reconnaissance Office (NRO) Office of Space Launch (OSL) Rapid Acquisition of a Small Rocket (RASR) program intends to validate the use of commercially developed launch systems and commercial contracts for providing launch services for NRO/OSL sponsored Small Satellites (SmallSats). The NRO/OSL is experiencing an increased demand in SmallSat launch service requirements.

2. Purpose

This SOW defines the Contractor requirements to provide launch services to the Government for the OSL-sponsored SmallSats. It also defines the scope of requirements the Contractor shall provide in delivering launch services which include the capability to transport, integrate, launch, and deploy Government provided payloads.

3. Scope

NRO/OSL is seeking launch services from a U.S. launch vehicle provider for missions which will be procured via the Rapid Acquisition of a Small Rocket (RASR) contract. The missions will consist of SmallSat configurations integrated with a variety of commercial dispensers/adapters. The NRO/OSL plans to select the configurations based upon an internal candidate list. The NRO/OSL seeks maximum flexibility in final candidate down-select timeline and flexibility in exchanging payloads after final down-select. The RASR launch service shall consist of a U.S. launch vehicle acquired directly from a U.S. launch service provider, and shall launch NRO/OSL sponsored payloads authorized by the RASR Contracting Officer (CO) or Contracting Officer's Technical Representative (COTR). The Contractor may launch payloads not sponsored by the NRO/OSL with NRO/OSL CO or COTR approval.

4. Requirements

4.1 Program Management

The Contractor shall perform program management tasks required to provide launch services to place payloads into their intended orbits as defined in Table 4.2-1. These tasks shall include as a minimum:

1. The Contractor shall be a U.S. launch vehicle provider or an exclusive affiliate or subsidiary of a U.S. launch vehicle provider.
2. The Contractor shall provide a primary and backup point of contact to the

for mission integration management and status.

(b)(3)

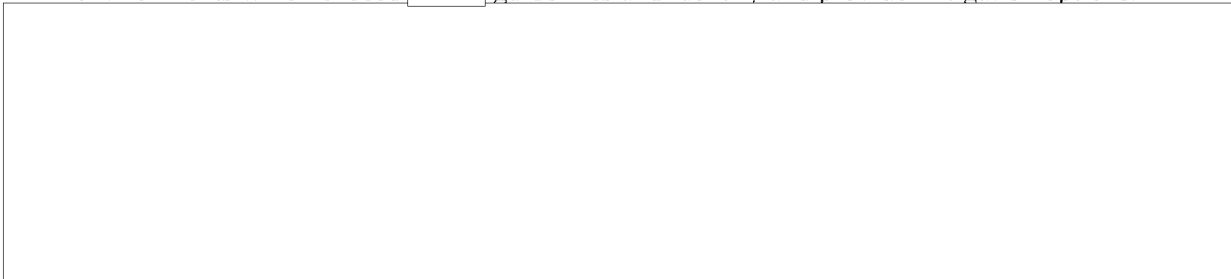
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- 3. The Contractor shall provide the [redacted] with insight into mission design, launch vehicle production, launch vehicle flight history/learning, licensing and permit status, and launch operations by conducting weekly mission integration and technical interchange meetings to work through interface issues, ICD development, and provide evidence of mission integration and launch vehicle progress towards launch readiness. The Contractor will lead these meetings, provide agendas, maintain action items, and be responsible for the closure of the action items. (b)(3)
- 4. The Contractor shall develop and maintain an integrated master schedule (IMS). The IMS shall be updated and presented during the [redacted] meetings and reflect the current status of integrated activities. (b)(3)
- 5. The Contractor shall provide the NRO/OSL with payload down-select and exchange options based on Contractor mission design, analyses, and integration timelines.
- 6. The Contractor shall support Public Affairs activities by coordinating with the NRO Office of Public Affairs (OPA). The Contractor shall submit all press releases, broadcast material, media material, social media plans/posts, or any related public affairs items to the NRO OPA for approval prior to release to the press or general public. The Contractor shall follow NRO OPA guidance regarding timing of public and media releases. The design for memorabilia (i.e., coins, patches, logos, etc.) must be approved by the Director, NRO. The Contractor shall submit proposed designs to NRO OPA and receive written prior approval prior to production of any material.
- 7. The Contractor shall be responsible for obtaining any necessary approval/licensing (i.e., Federal Aviation Administration) to successfully deliver the procured launch service.
- 8. The Contractor shall be responsible for all support range services necessary to successfully deliver the launch service.

4.2 Technical Performance

- 1. The Contractor shall provide all mission design, analysis, SV transportation, integration, and launch services required to launch OSL-sponsored SmallSat configurations with Initial Launch Capability's (ILC) defined in the Mission Unique Annex of this SOW.
- 2. The launch services shall have the performance capability to achieve the target orbit specified in the Mission Unique Annex.
- 3. The Contractor shall provide the necessary separation signals to initiate payload release from each of the dispensers. Specific payload release order and timing shall be documented in the ICD. The Contractor shall perform separation analyses to mitigate risk of separating payload collisions.
- 4. The Contractor shall provide confirmation of the separation signal (with time stamp) and state vector as soon as it is known at the time of separation for each payload.
- 5. For payload design purposes, the payload will design to the [redacted] [redacted] for launch service flight environments. Mission specific flight environments shall be documented in the ICD for the purposes of defining the payload test environments. The Contractor shall identify any payload environments which exceed [redacted] guidelines and identify and provide mitigation options. (b)(3)



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[Redacted]

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8. The Contractor shall provide payload processing and integration into dispensers/adapters, at a minimum, in an ISO 8 (Class 100,000) environment at either the launch site or standard integration and processing facility.
9. The Contractor shall have the capability to integrate various dispensers/adapters to accommodate CubeSats/SmallSats of varying sizes, 1U up to 12U and ESPA-class, and the mounting of SmallSats, including ESPA-class. The Contractor shall also support various existing commercially available dispensers, adapters, and separation systems. The Government will provide payload and their associated dispensers.
10. The Contractor shall manufacture, assemble, test, and transport the launch vehicle and all mission hardware required to provide the launch service and shall provide all materials, equipment, and facilities necessary for these tasks.
11. The Contractor shall develop and maintain an ICD for each payload in accordance with requirements in the SOW, and shall develop and manage the verification matrix for the requirements in each ICD. The RASR COTR may waive compliance with ICD requirements.
12. The Contractor shall perform all necessary mission design and analyses tasks to develop a launch service design which satisfies mission requirements as documented in the SOW and each of the ICDs. The OSL [Redacted] will participate in the ICD development, including the definition of the method of verification and detailed verification process planning, and change process. Formal verification of requirements shall be performed per the verification plan as specified in the ICD.
13. The Contractor shall comply with U.S. Government Orbital Debris Mitigation Standard Practices, requiring deorbit of the launch vehicle upper stage within 25 years or less and Estimation of Casualty compliance.
14. Launch services shall rely on the Contractor's internal mission assurance practices. The Contractor shall document internal mission assurance practices and provide to the OSL [Redacted] at the Kick-Off Meeting.
15. The Contractor shall provide the ability to implement various Day-of-Launch (DoL) CONOPS based on mission-specific GO/NO-GO requirements.

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4.3 Security and Chain of Custody

1. The Contractor shall meet the requirements specified in the DD Form 254.
2. The Contractor shall provide written documentation of their chain of custody plan to ensure positive control of the NRO payloads, and that they are protected and accounted for at each delivery and receipt in the mission integration, transportation, and storage process, and under constant United States controls.
3. The Contractor shall address and mitigate security risks associated with integrating, transporting, and launching NRO sponsored payloads through commercial infrastructure.

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5.0 Milestone Descriptions (As Required in Mission Unique Annex)

The Contractor shall host a series of milestones which provide the Government with insight into status of the mission design, analysis, integration, and launch processing efforts.

1. The Contractor shall host the milestones described below in section 5, or host Contractor proposed milestones which meet milestone review intent described in section 5, with prior Government approval. All derived requirements shall be identified and addressed in each of these reviews.
2. Design reviews shall meet the following requirements:
 - a) The Contractor shall provide an agenda to the Government for the MDR, Launch Vehicle Pre-Ship Review (LVPSR), LRR and Post-Launch Review no later than (NLT) 1 calendar month prior to the review.
 - b) The Contractor shall provide meeting and review documentation to the Government NLT 5 business days prior to the scheduled meeting or review.
 - c) The Contractor shall provide meeting and review minutes, notes, and action items to the Government NLT 3 business days after the meeting or review.

5.1 Kick-Off Meeting

1. Mission and Vehicle Overview
2. Proposed Integrated Master Schedule
3. Contractor identified risks to meeting requirements of SOW (Cost, Schedule, Technical)
4. Contractor internal plan for mission assurance.

5.2 Mission Design Reviews (MDR)

The Contractor shall conduct and chair mission design reviews which apply to the system, subsystem, component, and software level items of the launch service (launch vehicle, payload interface, and any supporting equipment). The MDRs shall include, but not be limited to, a summary of waivers; mission design; analyses results and status including updates, if any, from analyses not related to qualification; flight launch vehicle and launch site hardware/software production and testing status, and assessments of any significant manufacturing anomalies; space vehicle transportation plan as applicable; ICD status; coupled loads analysis status and results; SV and LV launch base CONOPS; IMS review; status of licenses and permits; mission-specific items of interest as identified by the Government. The contractor shall provide a summary of open hardware and missions risks with associated mitigation plans. The topics of the mission design reviews may be phased to align with the contractor's standard mission phasing of work.

5.3 Launch Vehicle Pre Ship Review (LVPSR)

The Contractor shall conduct a Launch Vehicle Readiness Review prior to LV hardware shipment to the launch site to demonstrate that the launch site and launch vehicle are ready to proceed with launch vehicle processing activities at the launch site. The Contractor shall present as a minimum:

1. Mission description including satellite vehicle and launch vehicle configuration, integration status, and a summary of open hardware and mission risks with associated mitigation plans.

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2. A detailed schedule showing all activities (ground and flight) remaining to achieve a successful, on-time launch.

5.4 Launch Readiness Review (LRR)

The Contractor shall conduct a LRR for the mission to ensure the specific launch vehicle is acceptable for flight and all Range and other mission requirements have been met, or will be satisfied prior to launch. The LRR shall include participation from any appropriate Range approving officials. The LRR is held approximately two (2) days before launch. As a minimum, the Contractor shall provide verification that any open items and deviations from the MDR and launch service LVPSR have been satisfied.

5.5 Launch

The Contractor shall deploy payloads into their required orbits.

5.6 Post-Launch Review

5.6.1 A mission will be determined a success, if:

1. The payload is placed into the required orbit by the launch vehicle as defined in this SOW, and
2. Received telemetry data shows the ICD environments and parameters were met, and
3. The launch vehicle causes no damage to the payload(s) during launch or thereafter from collision or contamination products.

5.6.2 Include verification that:

1. The launch vehicle orbit at payload separation agrees with prediction, or if not, it is adequately understood so that future behavior can be predicted with confidence.
2. The launch systems performed in compliance with the ICD.
3. All anomalies and out-of-family observations have been adequately documented, and their impact on future Contractor operations is assessed. Further, anomalies related to the payload to launch vehicle interface have had at least one credible cause identified to aid in the Contractor's future resolution.

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RASR SOW

Mission Unique Annex

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