SMEX 12/13/14 AO
ELV LAUNCH SERVICES PROGRAM INFORMATION SUMMARY
11/19/2007

Domestic ELV Launch Services Groundrules/Policy

Any procured domestic Expendable Launch Vehicles (ELV) proposed for this AO will be procured and managed by the NASA/Launch Services Program (LSP) via the NASA Launch Services (NLS) contract.

Under the provisions of the NLS Contract, the launch service includes the launch vehicle (LV) and associated standard services, non-standard services (mission unique options), all engineering and analysis, and minimum performance standards. LSP also provides technical management of the launch service, technical insight into the LV production/test, coordinates and approves mission-specific integration activities, provides mission unique LV hardware/software development, provides payload-processing accommodations, and manages the launch campaign/countdown.

Upon mission selection, LSP via the NLS Contract will competitively select a launch service provider for the mission based on customer requirements. Accordingly, assumption of a specific launch vehicle configuration as part of the AO proposal will not guarantee that the proposed LV configuration will be selected for award of a Launch Service Task Order, unless there is firm technical rationale for sole source. This rationale should be clearly explained in the proposal.

All NASA-procured launch services are to be consistent with NASA Policy Directive (NPD) 8610.7, NASA Launch Services Risk Mitigation Policy. Expendable launch services acquired from NASA will be managed in accordance with NPD 8610.23, Technical Oversight of Expendable Launch Vehicle (ELV) Launch Services and NPD 8610.24, Launch Services Program (LSP) Pre-Launch Readiness Reviews. These NPD's can be accessed through the URLs:

http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8610_007C_&page_name=main

http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8610_023C_&page_name=main

http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8610_024B_&page_name=main

Dual manifested or secondary payloads will not be considered under the cognizance of this AO.

Contributed Domestic or Foreign Launch Vehicles

The provision of launch services, as a contribution to an Explorer mission by a U.S. or non-U.S. partner, may be proposed only on a no-exchange-of-funds basis (i.e., at no cost to NASA). Contributed launch vehicles and launch services may be proposed as long as the value of the contribution is within the cap on contributions (one-half of PI Mission Cost; see Section 5.4.3).

It is the responsibility of the proposer to secure an organization that will contribute a launch, if a contributed launch is part of the proposed investigation. The proposer of a mission with a contributed ELV must identify the opportunity and provide evidence in the proposal that the launch service provider agrees to manifest the mission should the proposal be selected and confirmed for flight. The demonstrated reliability and the resultant probability of mission success will be evaluated as described above for both contributed launch services and NASA SMD-funded launch services. However, contributed launch services will be evaluated consistent with National Space Transportation Policy, Public Law, and NASA's Launch Services Risk Mitigation Policy. For any co-operative contributed launch vehicle, the approach for NASA's insight for launch services should be submitted in the proposal. The contributed launch service will be assessed in conjunction with NASA stakeholders as part of the selection process. The NASA Flight Planning Board assuring consistency with Agency risk strategy will approve final mission assignment.

Information on the reliability of ELV's may be obtained from the point of contact listed in this document..

Launch Vehicle Information/Configuration/Performance

The NASA Launch Services Program (LSP) has developed an on-line payload planner's guide for vehicles on contract to NASA. This web site contains information relevant to NASA-procured launch services. The information provided includes all NASA Launch Services (NLS) launch vehicle configurations that are available as well as payload fairing envelopes. This planning tool can be found at the following web address: https://elvppg.ksc.nasa.gov. Access to this site requires a self-determined password, which is activated by the site administrator at the LSP. A user can request access/password activation by going to the site and following the directions provided on the log-in screen as well as providing the required information. Access to this web site can typically be activated within 24-48 hours during the week. Prior to AO release, questions can be directed to the points of contact located on the website, otherwise refer to the Technical and Scientific Inquiries section of the AO.

The Offerors should select the minimum launch service performance class that meets their requirements including adequate performance margins. As a reference, the LSP has developed an on-line tool to assist in determining LV performance. This tool is publicly accessible at the following web address: http://elvperf.ksc.nasa.gov. The performance information reflects figures consistent with the NLS contractual commitments. All of these figures reflect separated spacecraft mass and each have associated ground rules/assumptions (including the adapter-type). For variations from what is found on-line, contact LSP for an assessment. The Offerors should specifically state in the proposal the launch service performance range to meet their requirements for this mission.

Launch Service Costs

With the exception of the options noted below, the launch service costs will be held by the Explorers Program. Provided in the launch service costs are the launch service, nominal allocation for mission unique launch vehicle modifications/services, mission integration, launch site payload processing, range support and telemetry support.

The only options AO offers must account for in their proposals are listed in Table 1. These options include the addition of a supplemental propulsion system or utilization of the Kwajalein launch site. Performance and budget estimates are provided for both. Funding estimates for the proposal are stated in real-year dollars with the assumed launch date provided**.**

Evaluation Criteria

Attachment 1 shows the Evaluation checklist that will be used as a guide for the evaluators during the proposal evaluation phase. This checklist should give the offerors an indication of the types of information that are expected to be contained in the proposals.

NASA Launch Services Program Point of Contact for Additional Information

Prior to AO release, additional information including performance quotes, mission integration inquiries and costs may be obtained directly from the point of contact below. Otherswise questions must be directed as indicated in the Technical and Scientific Inquiries section of the AO:

Cheryl A. Malloy
Mission Manager
NASA Launch Services Program
Code VA-C
Kennedy Space Center, FL 32899

Phone: 321-867-3778
Email: Cheryl.A.Malloy@nasa.gov

Table 1
Launch Services Performance Ranges and Cost Figures $M

ELV Launch Service Class

Additional Options	Launch Date	FY10	FY11	FY12	Total ($M)
Kwajalein Launch Site	4/12	**2.4**	**2.2**	**1.2**	**5.8**
Supplemental propulsion	4/12	**1.3**	**1.3**	**1.3**	**3.9**
Additional Options	**Launch Date**	**FY11**	**FY12**	**FY13**	**Total ($M)**
Kwajalein Launch Site	4/13	**2.3**	**2.2**	**1.3**	**5.8**
Supplemental propulsion	4/13	**1.4**	**1.4**	**1.4**	**4.2**
Additional Options	**Launch Date NLT**	**FY12**	**FY13**	**FY14**	**Total ($M)**
Kwajalein Launch Site	4/14	**2.4**	**2.2**	**1.4**	**6.0**
Supplemental propulsion	4/14	**1.4**	**1.5**	**1.5**	**4.4**

Notes: Additional Performance Information
Listed below is the performance from typical inclinations for the most common launch sites. Any deviation from these inclinations will have an impact on the available performance.

Performance:

Range	Assumed Inclination	Altitude Range	Performance Range
Eastern	28.5 deg	200 – 1400 km	120 – 450 kg
Western	Sun-synchronous	200 – 1100 km	120 – 325 kg
Wallops	45 deg	200 – 1300 km	130 – 425 kg
Kwajalein (Regan Test Site, RTS)	60 deg	200 – 1300 km	115 – 395 kg

Static Payload Envelope

Launch Vehicle Station		Length forward of Payload Separation System forward face		Diameter		Comments
(in)	(cm)	(in)	(cm)	(in)	(cm)	
584.80	1485.4	0.00	0.0	45.82	116.4	Plane of the payload separation system forward face
604.80	1536.2	20.00	50.8	45.40	115.3	Nominal payload diameter
628.50	1596.4	43.70	111.0	44.90	114.1	Ogive Mate Line
669.00	1699.3	84.20	213.9	27.90	70.9	Diameter at maximum payload length

Dynamic Payload Envelope

Launch Vehicle Station		Length forward of Payload Separation System forward face		Diameter		Comments
(in)	(cm)	(in)	(cm)	(in)	(cm)	
584.80	1485.4	0.00	0.0	46.42	117.9	Plane of the payload separation system forward face
604.80	1536.2	20.00	50.8	46.00	116.8	Nominal payload diameter
628.50	1596.4	43.70	111.0	45.50	115.6	Ogive Mate Line
669.00	1699.3	84.20	213.9	28.60	72.6	Diameter at maximum payload length

Note: Launch vehicle station reference is a point in space 18.50 in (47.0 cm) aft of the stage 1 nozzle exit plane.

Ground Rules:

- This performance does not include the effects of orbital debris compliance, which must be evaluated on a mission-specific basis. This could result in a significant performance impact for missions in which launch vehicle hardware remains in Earth orbit.
- Guidance reserves account for 3-sigma flight performance.
- Performance is for baseline configuration; non-standard, mission-unique hardware will require additional assessment.
- 38-inch (0.96-meter) separation system.
- Mass of entire separation system is book-kept on the launch vehicle side.
- Listed performance is for separated spacecraft mass.

Considerations for supplemental propulsion system

The primary purpose of a supplemental propulsion system is to achieve smaller injection errors, however there are also performance implications. The addition of a supplemental propulsion system will generally provide for a performance benefit when considering altitudes above 600 km and a performance degradation for altitudes which are lower.

Performance (with supplemental propulsion):

Range	Assumed Inclination	Altitude Range	Performance Range
Eastern	28.5 deg	200 – 1400 km	175 – 360 kg
Western	Sun-synchronous	200 – 1100 km	115 – 250 kg
Wallops	45	500 – 2000 km	160 - 335 kg
Kwajalein (Regan Test Site, RTS)	60 deg	200 – 1300 km	150 – 315 kg

Static Payload Envelope

Launch Vehicle Station		Length forward of Payload Separation System forward face		Diameter		Comments
(in)	(cm)	(in)	(cm)	(in)	(cm)	
595.25	1511.9	0.00	0.0	45.60	115.8	Plane of the payload separation system forward face
604.80	1536.2	9.55	24.3	45.40	115.3	Nominal payload diameter
628.50	1596.4	33.25	84.5	44.90	114.1	Ogive Mate Line
669.00	1699.3	73.75	187.3	27.90	70.9	Diameter at maximum payload length

Dynamic Payload Envelope

Launch Vehicle Station		Length forward of Payload Separation System forward face		Diameter		Comments
(in)	(cm)	(in)	(cm)	(in)	(cm)	
595.25	1511.9	0.00	0.0	46.20	117.3	Plane of the payload separation system forward face
604.80	1536.2	9.55	24.3	46.00	116.8	Nominal payload diameter
628.50	1596.4	33.25	84.5	45.50	115.6	Ogive Mate Line
669.00	1699.3	73.75	187.3	28.60	72.6	Diameter at maximum payload length

Note: Launch vehicle station reference is a point in space 18.50 in (47.0 cm) aft of the stage 1 nozzle exit plane.

Additional Ground Rules:

- Vehicle environmental levels need to be evaluated on a mission-specific basis due to configuration
- changes associated with a supplemental propulsion system.

Cost Profile Assumptions

- Fluctuation of the cost of the launch vehicle will not be the responsibility of the PI once the mission is selected for flight (end of phase A) with the exception that the PI is responsible for any costs resulting from a change in launch vehicle requirements generated by the mission at any time in the development of the mission.

- Prices for 2010 launch dates and later are notional and are subject to change. They are based on the current NLS contract. HQ Program should hold reserves to cover unexpected PRICE fluctuations associated with Range capability and market fluctuations associated with the launch service industry.

- Launch Service will be competed through the LSTO Acquisition Process. The launch service prices
- are estimates and are not to be considered commitments from the Launch Service Program.

- The funding profiles provide for the launch service, nominal allocation for mission unique launch
- vehicle modifications/services, mission integration, launch site payload processing, range safety, and
- telemetry/communications.

Not included in this budget profile:

- Supplemental propulsion system
- Nuclear Launch Approval
- Kwajalein (Reagan Test Site, RTS)

- Budget provided does not include launch delays.

- All costs are estimated in real-year dollars (order year=L-27 mo.) based on current NLS contract information.

Attachment 1

AO Evaluation Form

Launch Services Program

Proposal Name: _____

Proposal #: _____

Evaluator POC: _____

Phone: _____

Email: _____

Launch Service Technical Evaluation:

Overall Assessment: - Given the ground rules in the AO, is the proposed launch vehicle (LV) concept feasible for this application? (☐Yes or ☐ No)

Comments:_____

_____

LV Performance: Area of concern (☐Yes or ☐ No)

Proposed LV configuration: _____

Proposed Launch Date: _____

Launch Period (MM/DD/YYYY to MM/DD/YYYY): _____/____/_____ to _____/____/_____

Launch Window (On any given day of the launch period Minutes:Seconds): _____ : _____

Orbit requirements: Apogee: _____ km Perigee: _____ km Inclination: _____deg.

High Energy requirements: C_3: _____ km^2/sec^2 DLA: _____deg RLA: _____deg

Proposed LV Performance: _____

Mass (including reserves) Dry Mass: _____ kg Wet Mass: _____ kg

Dry Mass Margin: _____ kg _____ %

Wet Mass Margin _____ kg _____ %

Formulas:
Mass Margin kg = LV Performance – S/C Mass (including reserves)
Mass Margin % = [(Mass Margin kg)/ S/C Mass (including reserves) kg] X 100

LV Performance Comments/issues/concerns:

_____

_____

Launch Service Cost Assessment: Area of concern (☐Yes or ☐ No)

Is there additional funding for any mission unique modifications/services? (☐Yes or ☐ No)

LV Integration: Area of concern (☐Yes or ☐ No)

Does the proposer have experience in LV integration? (☐Yes or ☐ No)
LV to Spacecraft Interface: Area of concern (☐Yes or ☐ No)

Proposed Payload Fairing (PLF) _____

Spacecraft (S/C) Dimensions: Radial:_____ m Height _____ m

Any intrusions outside of the PLF usable dynamic volume? (☐Yes or ☐ No)

Mechanical Interface:

Standard Adapter: _____ Custom Adaptor: _____

Electrical Interface:

Standard _____ Pin(s) Connector(s): (☐Yes or ☐ No)

Mission Unique requirements:

Instrument T-0 GN_2 Purge: (☐Yes or ☐ No)

T-0 S/C Battery Cooling: (☐Yes or ☐ No)

Planetary Protection Requirements: (☐Yes or ☐ No)

Contamination Control Requirements: PLF: (☐Yes or ☐ No) LV adapter: (☐Yes or ☐ No)

Cleanliness Level: _____ other: _____

Unique Facility Requirements: (☐Yes or ☐ No)

Pad: _____

S/C Processing Facility: _____

S/C Environmental Test Plans

Environmental Test Plan/Flow described: (☐Yes or ☐ No)

Test Levels provided: (☐Yes or ☐ No)

Test Schedule provided: (☐Yes or ☐ No)

Comments/issues/concerns: _____
_____

Spacecraft Schedule: Area of concern (☐Yes or ☐ No)

Adequate timing of:
- Launch Service Integration Start Time: (☐Yes or ☐ No)
- S/C Environmental Test Program: (☐Yes or ☐ No)
- Delivery of Verified S/C Model: (☐Yes or ☐ No)
- S/C ship date: (☐Yes or ☐ No)
- S/C to LV integrated Operations: (☐Yes or ☐ No)

Missions with Radiological material Area of concern (☐Yes or ☐ No)

List the Radiological Sources: _____

Are unique facilities required to store/process the Radiological Sources? (☐Yes or ☐ No)

Any LV modifications required for additional safety or Launch approval? (☐Yes or ☐ No)