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LAUNCH SERVICES PROGRAM

NASA Launch Services Program

**Earth Venture AO Pre-Bidders Proposal Conference
March 4, 2011**

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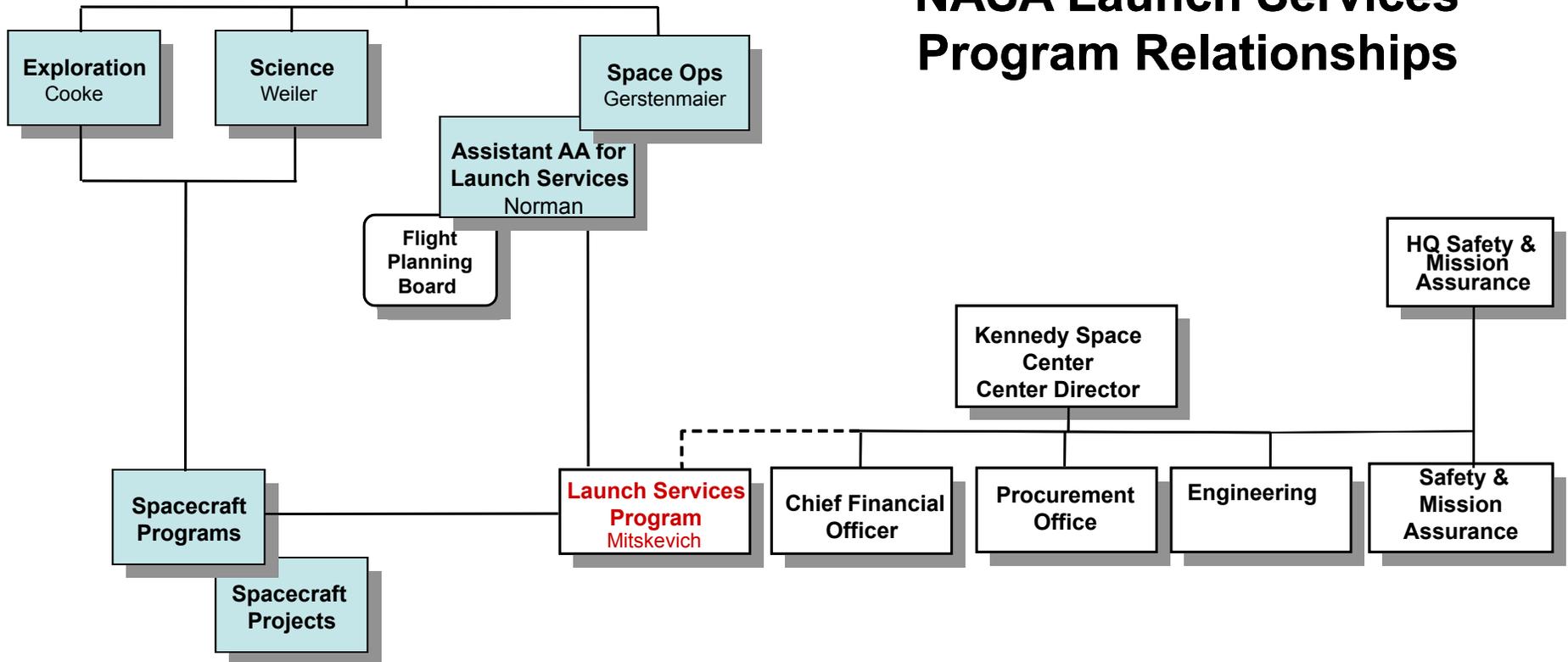


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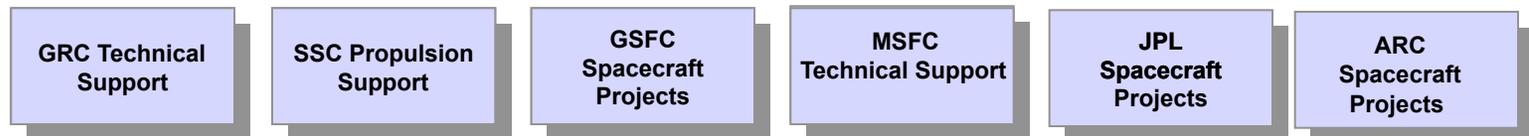
NASA HQ
Bolden

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NASA Launch Services Program Relationships



Interfaces to other NASA Centers





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Launch Services Program

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The Launch Services Program provides management of the launch service, technical oversight of the launch vehicle production/test, coordinates and approves mission-specific integration activities, provides mission unique launch vehicle hardware/software development, provides payload-processing accommodations, and manages the launch campaign/countdown.



LSP Functional Structure

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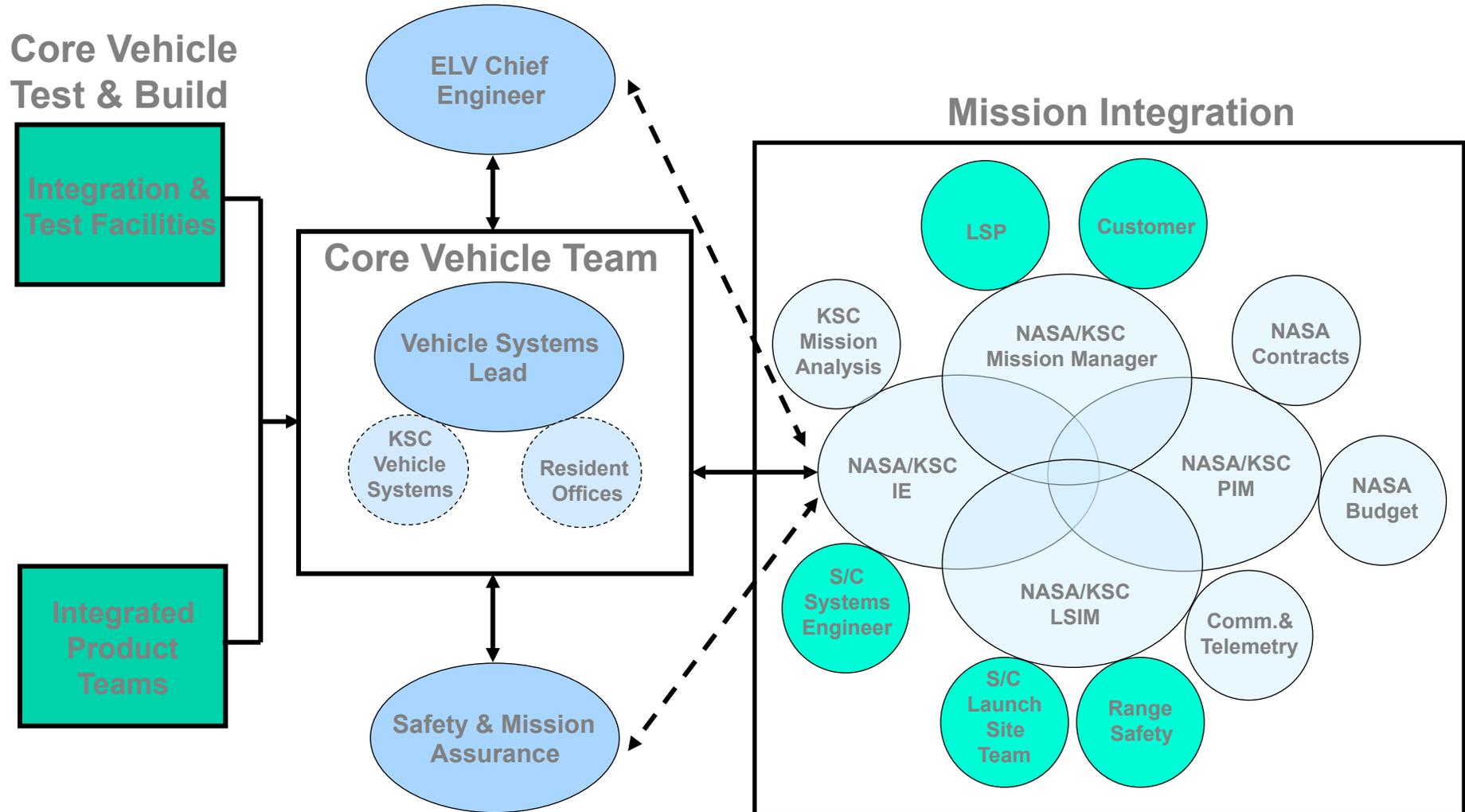
- **LSP procures/provides a Launch Service**
 - Its more than the basic launch vehicle
 - We don't buy a tail number
 - This is a commercial FFP procurement with additional insight and oversight
- **To enable this, LSP has two functional sides**
 - **Mission integration**
 - » Mission Integration team assigned to each mission
 - » Manages mission specific procurement, integration, and analysis
 - » Includes launch site integration and processing
 - **Fleet management**
 - » Personnel assigned to each contracted rocket
 - » Includes resident offices within the production facilities of all active providers
 - » We watch the production and performance of entire fleet – we certify the manufacture's production line, not just a particular unit (tail number)
 - » We have a say in any change/upgrade/anomaly
 - » Big stick – no-go for launch
- **Interface with Safety and Mission Assurance**
 - Safety
 - Quality



Technical Information flow into the MIT

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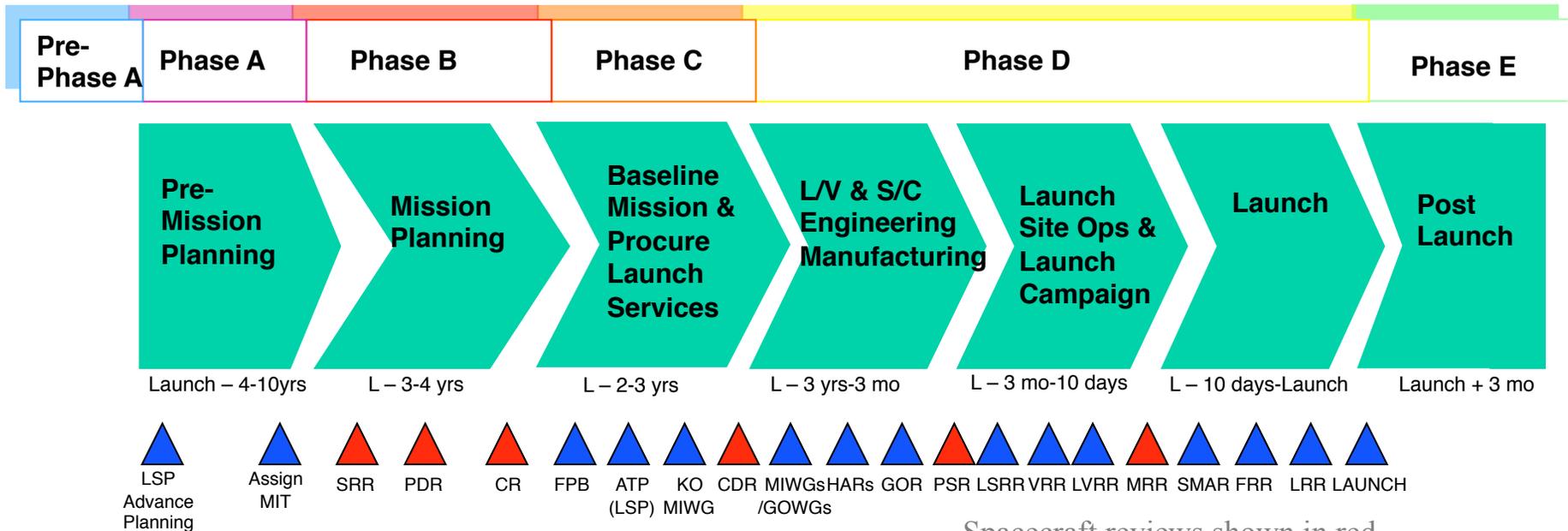


Ground Rules

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- Any acquisition of a non-contributed domestic expendable launch vehicle proposed for this AO will be procured and managed by the NASA/Launch Services Program (LSP) via the NASA Launch Services (NLS) contract.
- The LSP will competitively select a launch service provider for these missions based on customer requirements and NASA Flight Planning Board (FPB) approval.



Spacecraft reviews shown in red.



Available Vehicles

- Assumption of a specific launch vehicle configuration as part of this AO proposal will not guarantee that the proposed LV configuration will be selected for award of a launch service competitive procurement
 - Firm technical rationale for sole source justification is required in the proposal, and NASA would have to obtain appropriate approvals.
- The Agency policy, NPD 8610.7, “Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Mission” has been modified so newer launch service providers are eligible earlier to compete for any of NASA’s missions.



Available Vehicles - Continued

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- NLS II has provided additional LV to be considered
- Most likely candidate vehicles for Earth Venture AO that are available on the NLS II contract are
 - Pegasus XL
 - Falcon 1
- Bidders must remain compatible with vehicles that provide their performance requirements
- LSP uses the NLS II contract and not the launch vehicle providers users guides when determining LV configurations and performance.



Launch Service Budget

- The launch service includes:
 - The launch vehicle, engineering, analysis, and minimum performance standards and services provided by the contract.
 - Launch Site Processing
 - Range Support
 - Down Range Telemetry support (launch vehicle only)
 - Standard Mission Uniques – these are items typically necessary to customize the basic vehicle hardware to meet spacecraft driven requirements. Already budgeted for are items like Pre-ATP studies such as coupled loads and/or trajectories analysis, a GN2 or pure air purge prior to T-0 and 10,000 Class integration environment.
 - Budget does not include launch delays.



Option Costs

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Non-standard services and options that proposers must account for:

Additional Options:	Launch Date NLT	Total (\$M)
Mission Unique Adapter	12/16	1.0
Payload Isolation System*	12/16	1.5
Supplemental Propulsion**	12/16	proposer provided
Additional Options	Launch Date NLT	Total (\$M)
Mission Unique Adapter	12/17	1.04
Payload Isolation System*	12/17	1.56
Supplemental Propulsion**	12/17	proposer provided
Additional Options	Launch Date NLT	Total (\$M)
Mission Unique Adapter	12/18	1.08
Payload Isolation System*	12/18	1.63
Supplemental Propulsion**	12/17	proposer provided

* Bidders may choose to provide their own isolation system.

** Due to the multiple launch vehicle configurations within this launch vehicle class, supplemental propulsion systems must be defined and provided by the proposer to meet mission requirements. The system proposed and the spacecraft shall remain within the fairing envelopes provided.



Performance by Launch Site

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Range	Assumed Inclination - Degrees	Altitude Range km	Max Performance kg
Cape Canaveral Air Force Station, CCAFS	28.5 ° - 51.6 °	200 - 2000	450
Vandenberg Air Force Base, VAFB	60 ° - 90 °, SunSynch	200 - 1200	375
Wallops Flight Facility, WFF	38 ° - 51.6 °	200 - 1300	435
Reagan Test Site, RTS	0 ° - 90 °, SunSynch	200 - 2000	450

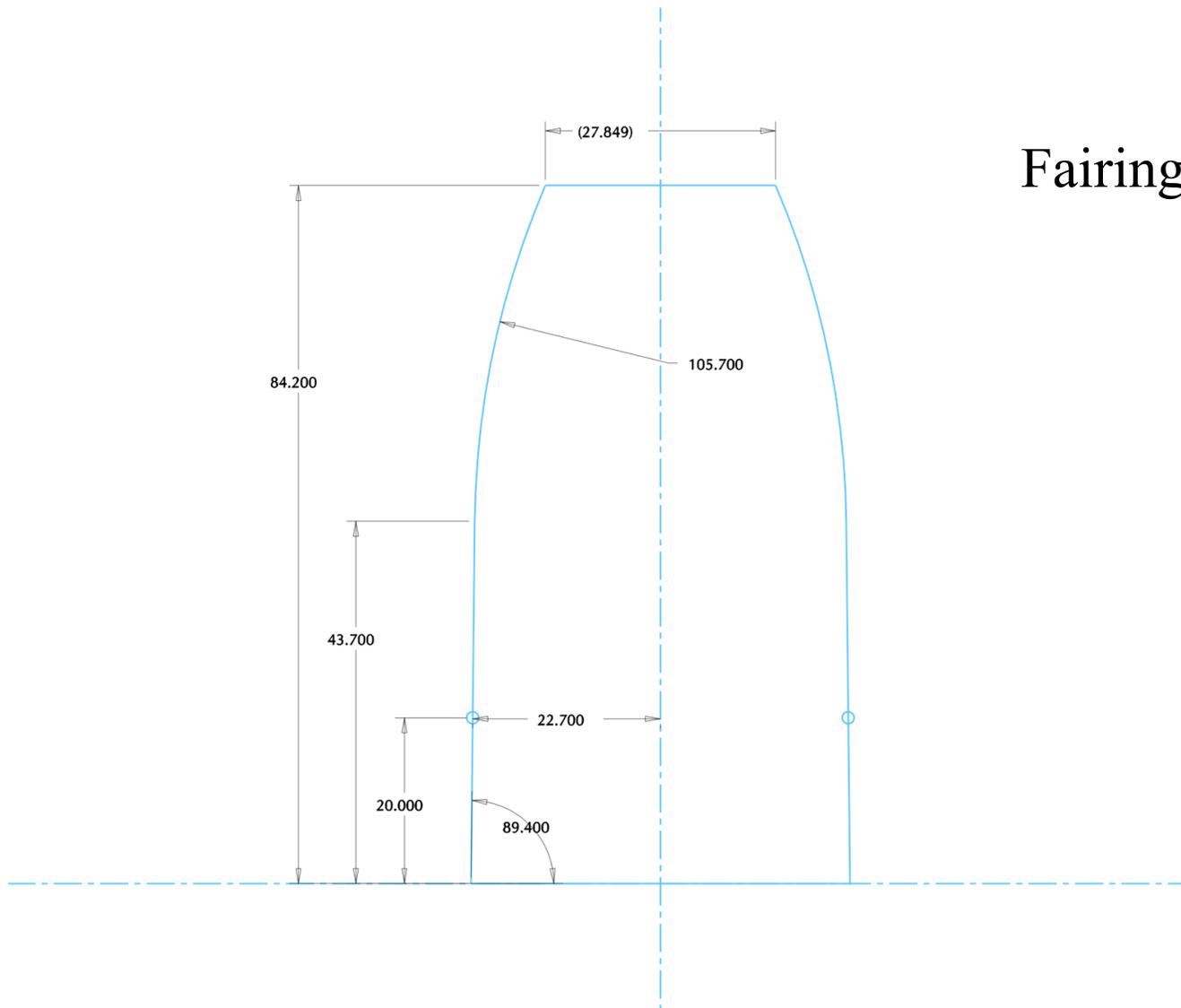
- This performance does not include the effects of orbital debris compliance, which must be evaluated on a mission-specific basis. This could result in a significant performance impact for missions in which launch vehicle hardware remains in Earth orbit.
- Guidance reserves account for 3-sigma flight 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.



Static Envelopes

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Fairing Envelope



Summary

- It is the Launch Service Program's goal to ensure the highest practicable probability of mission success while managing the launch service technical capabilities, budget and schedule.
- Questions must be officially submitted to garrett.l.skrobot@nasa.gov; LSP will gladly respond as quickly as possible.



Back Up



Evaluation

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- **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)

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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): _____ : _____ .



Evaluation

- **LV Performance: Area of concern (cont)**

- Orbit requirements: Apogee: _____ km Perigee: _____ km
Inclination: _____ deg.
- High Energy requirements: C³: _____ km²/sec² 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:



Evaluation

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- **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 Static volume? (Yes or No)
 - **Mechanical Interface:**
 - Standard Adapter: _____ Custom Adaptor: _____
 - **Electrical Interface:**
 - Standard _____ Pin(s) Connector(s): (Yes or No)



Evaluation

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- **LV to Spacecraft Interface: Area of concern (Yes or No)**
- **Mission Unique requirements:**
 - Instrument T-0 GN² 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:



Evaluation

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- **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)**