JOHN F. KENNEDY SPACE CENTER

LAUNCH SERVICES PROGRAM

NASA
LAUNCH SERVICES PROGRAM

HE22 SMEX AO PRE-PROPOSAL CONFERENCE
October 6, 2022

Shaun Daly

LSP Flight Projects Office

NASA Launch Services Program Relationships (NASA/HEOMD/KSC)

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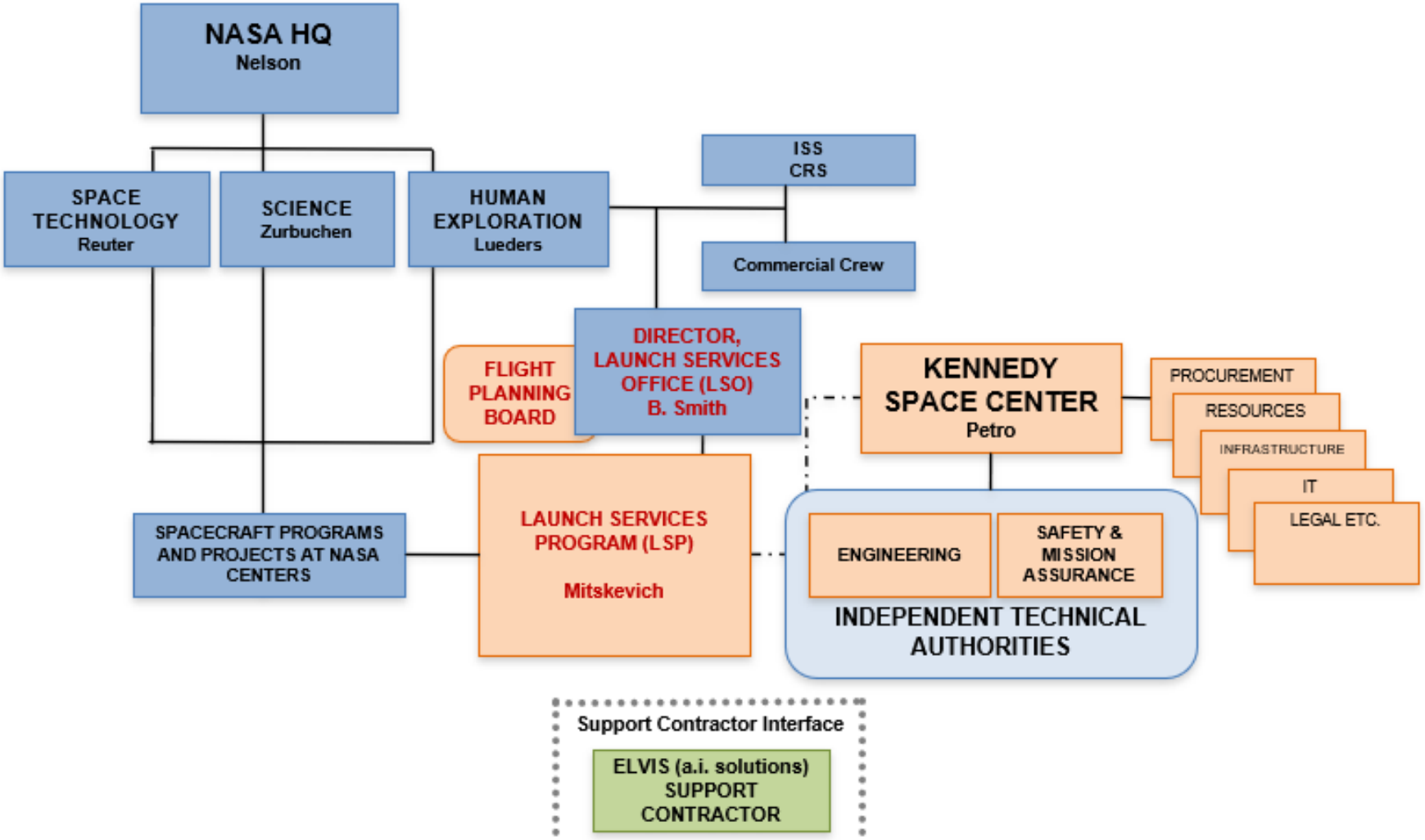

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LSP Organizational Structure

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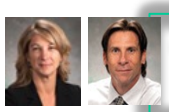
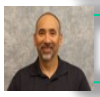


LAUNCH SERVICES PROGRAM
Amanda Mitskevich
Chuck Dovale

Matrixed Organizations

LAUNCH DIRECTOR
Omar Baez

Launch Manifest Coordination



FLIGHT PROJECTS
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Mission Management Pre-Phase A–E

FLIGHT ANALYSIS
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Flight Dynamics Flight Structures and Environments

PROGRAM PLANNING
Lisa Haber

Strategic Planning Policy

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VAFB Resident Office Chief Program Support Coordination

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James Wood

ENGINEERING
Bob Mott

CHIEF SAFETY OFFICER
Joe Dant

S & MA
Jessica Williams

Technical Authority

PROCUREMENT
Terry Crowley

CHIEF FINANCIAL OFFICE
HQ McKinney

CHIEF COUNSEL
Joe Batey

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Denise Pham/Jorge Piquero

Fleet
Integration Engineering
Field Offices

PROGRAM BUSINESS
Bobbi Gnan/Brian Smith

Contracts
Budgeting

INFRASTRUCTURE MGMT
Ralph Mikulas

Ground Systems
Launch Site
Comm & Telemetry

NASA LSP Functional Structure

- NASA Launch Services Program (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 (MIT) 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
- LSP maintains the final go or no-go for launch for NLS-2 procured missions (not applicable in the same manner for VADR missions)
- Interface with Safety and Mission Assurance
  - Safety
  - Quality

Options available for this AO

Several options are available to proposers for the 2022 Heliophysics Explorer AO

SMEX Launch Option Summary	**Representative Orbit**	***Maximum* Mass to Representative Orbit**
1 or 2 × Option A	500 km Sun-Synchronous*	1 or 2 × 300 kg
1 × Option B	500 km Sun-Synchronous*	1 × ~~960~~ **910** kg
1 or 2 × ESPA or *1 or 2* × ESPA Grande Port *(Option C)*	**Low Earth Orbit,** Geosynchronous Transfer Orbit **or Cis-Lunar Space**	1 or 2 × 220 kg per ESPA Port or **1 or 2** × 465 kg per ESPA Grande Port
1 × Option A and 1 × Option C	**As per Option**	**As per Option**

* For other orbits, refer to the *Launch Services Program Information Summary*

Note: A reimbursement of up to $6M (Fiscal Year 2022), covering the proposed cost, is offered as an increase to the AO Cost Cap for missions utilizing Option A or B or C that require a PI-provided propulsive stage or a propulsion system augmentation (e.g., tank size or thrusters) necessary to achieve insertion or phasing into a target orbit. [amended August 30, 2022]

Options available for this AO, Cont.

Several options are available to proposers for the 2022 Heliophysics Explorer AO

- **Section 5.9.2 AO-Provided Access to Space (FAA-Licensed Launch Services under VADR) for Options A and B**
  - » **Launch services expected to be provided under new VADR Contract for:**
    - **Option A 300 kg to 500 km Sun-synchronous orbit**
    - **Option B 910 kg to 500 km Sun-synchronous orbit**
  - » **Domestic launch vehicle certified as category 1 per NPD 8610.7D**
  - » **Modified technical oversight approach per NPD 8610.7D *Launch Services Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Missions* will be executed for AO for Class D payloads.**
  - » **PI-Managed Mission Costs must cover services beyond standard launch service offered (see attachment 5 in *NASA Launch Services Program (LSP) Information Summary*)**

- **AO-Provided Rideshare Access to Space for Option C**
  - » **Via ESPA/ESPA Grande (or equivalent adapter) as a secondary payload**
  - » **May utilize one or two SPA ports**

Options available for this AO, Cont.

Several options are available to proposers for the 2022 Heliophysics Explorer AO

- **Alternative Access to Space arrangements by PI are permitted under this AO**
  - » **PI will be required to meet NPD 8610.23C *Launch Vehicle Technical Oversight Policy***
  - » **If selected mission uses a Launch Service that is not certified to Cat 1 per NPD 8610.07D *Launch Services Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Missions,* PI will be responsible for conducting the certification.**
  - » **LSP will not be performing an advisory role for a mission using Alternative Access to Space.**
    - **Upon award of a PI provided service, LSP will be available to answer PI questions about meaning within NPD 8610.7 and NPD 8610.23 for class D missions.**

Section 5.9.2 AO-Provided Primary Launch Services

(Commercial FAA-Licensed Launch Services LSP Procured under VADR)

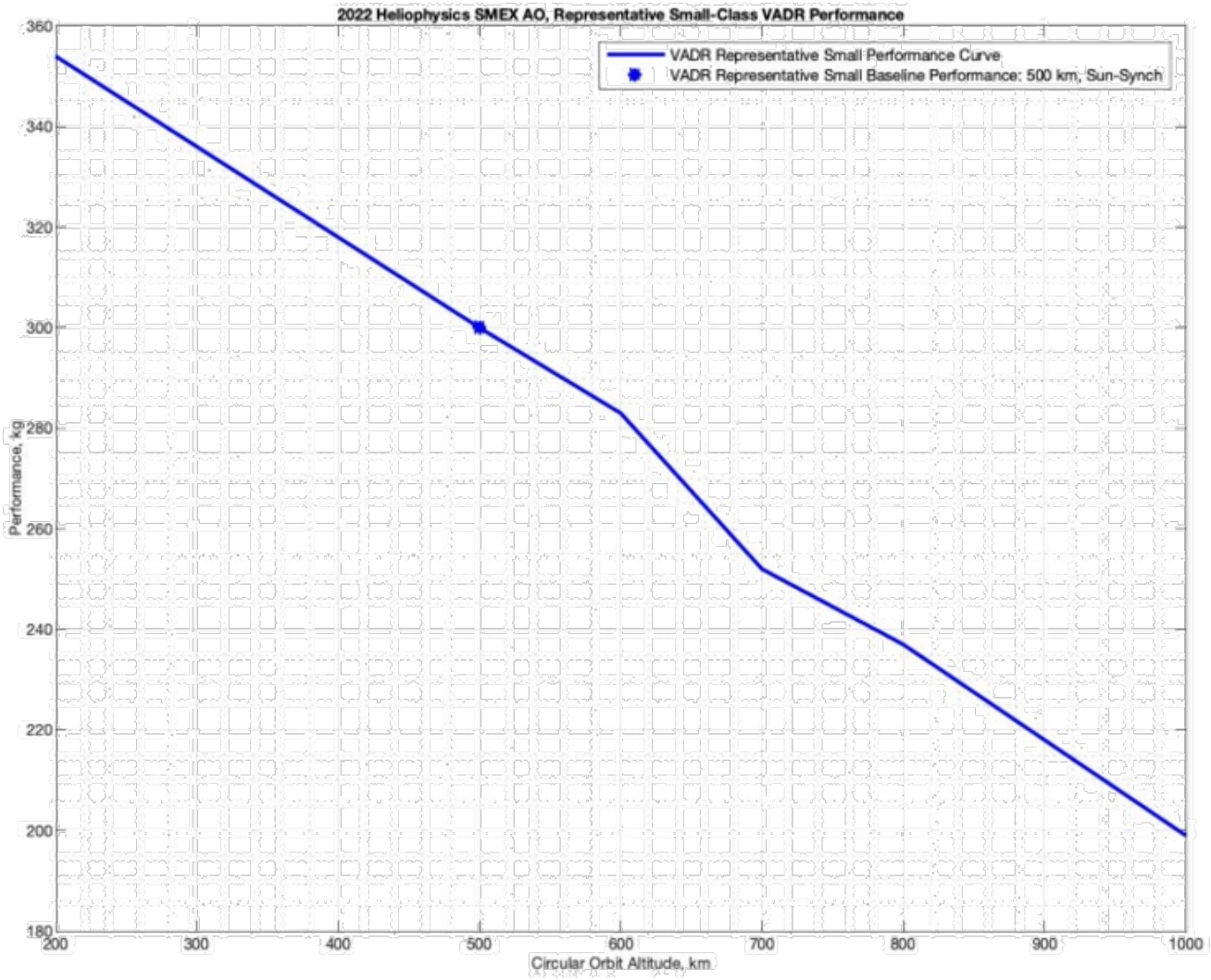
Option A and B

Commercial FAA-Licensed Launch Services

- **Assumption of a specific launch vehicle configuration as part of the AO proposal will not guarantee that the proposed LV configuration will be selected**
- **Proposers are advised to plan for compatibility with the launch vehicle summary through spacecraft Preliminary Design Review.**
  - **Payload design should accommodate the limiting/enveloping launch characteristics and capabilities included in "Commercial FAA-Licensed Launch Services Program Information Summary" document**
- **Domestic launch vehicle on its first flight will be permitted; however, prior to launch the vehicle will be certified as Category 1 per NPD 8610.7D, *Launch Services Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads/Missions* (see AO Library).**
- **A modified technical oversight approach per NPD 8610.7D Launch Services Risk Mitigation Policy for NASA-Owned and/or NASA-Sponsored Payloads/Missions will be used for Class D missions.**

Commercial FAA-Licensed Launch Services Perfomance

Option A



Commercial FAA-Licensed Launch Services Perfomance

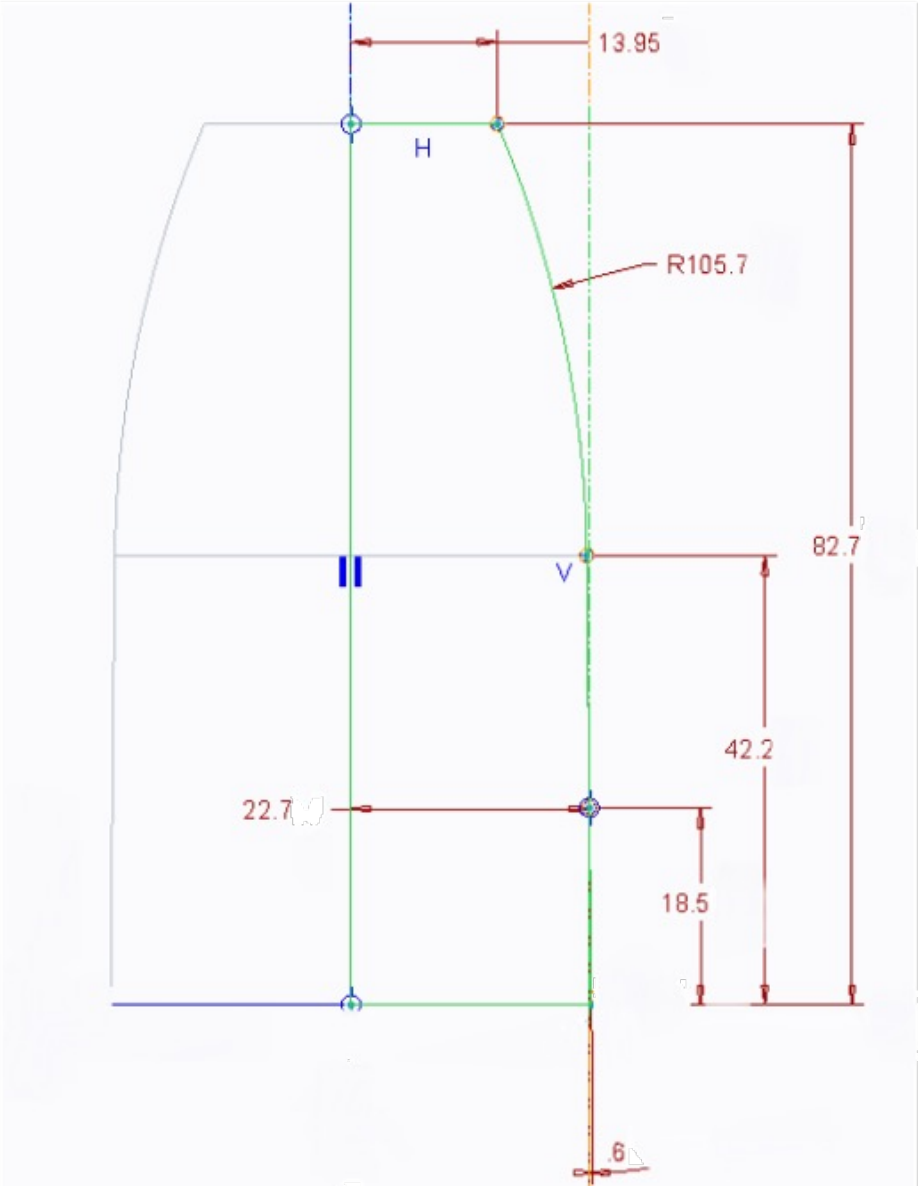


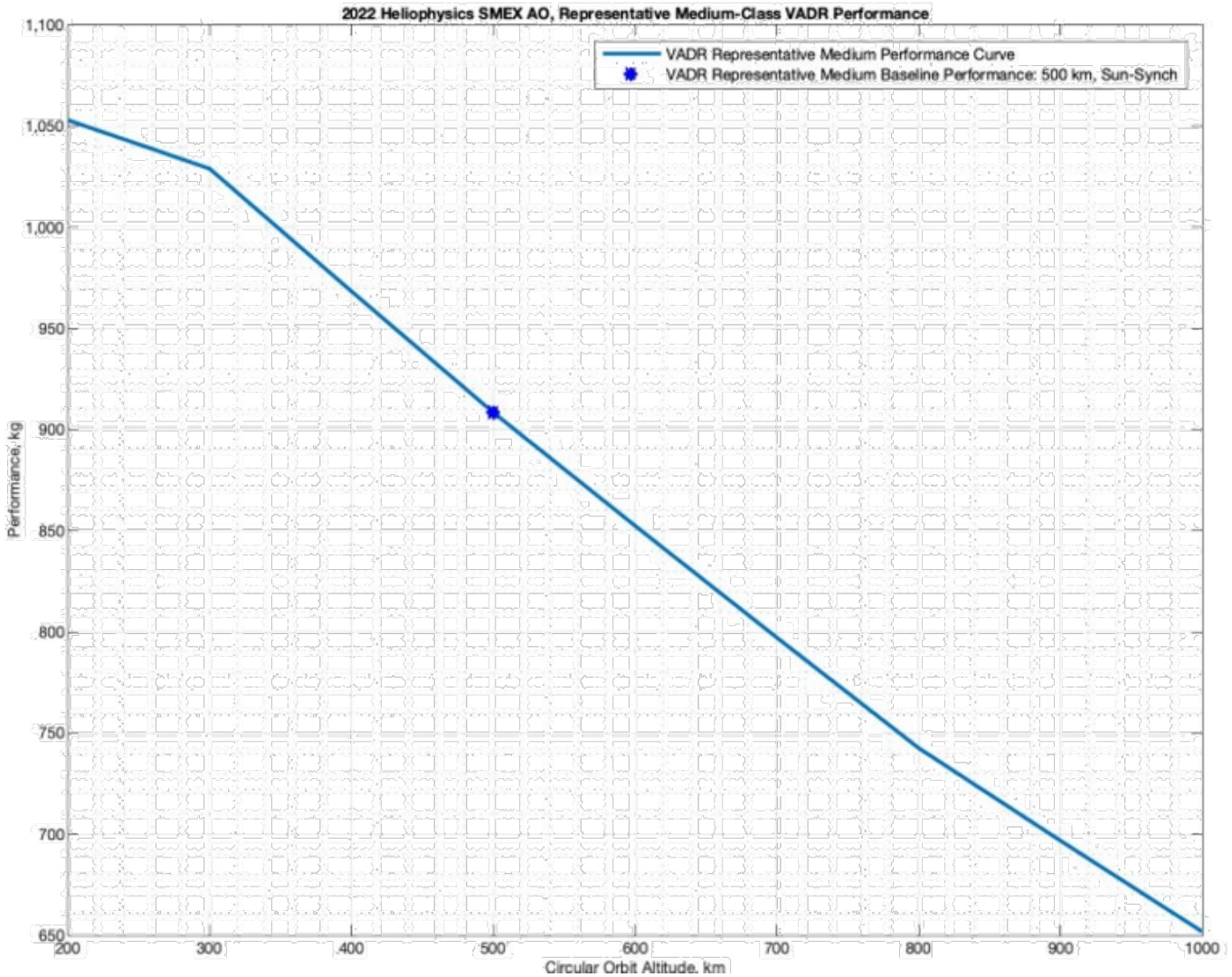
Figure 2
Static Fairing Envelope (in.)

- Proposals should include sufficient S/C dimensions to validate fit within this PLF static envelope, including any close approaches.

- Figure has been reduced by 1.5" to account for a typical payload isolation system. If the Spacecraft is providing its own isolation system, 1.5 inches may be added to overall height shown.

Commercial FAA-Licensed Launch Services Perfomance

Option B



Commercial FAA-Licensed Launch Services Perfomance

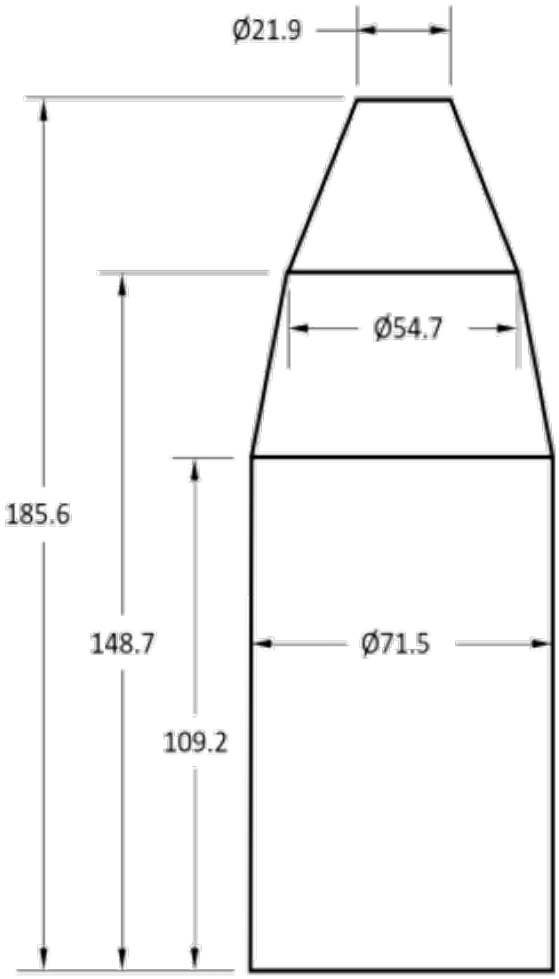


Figure 4
Static Fairing Envelope (in.)

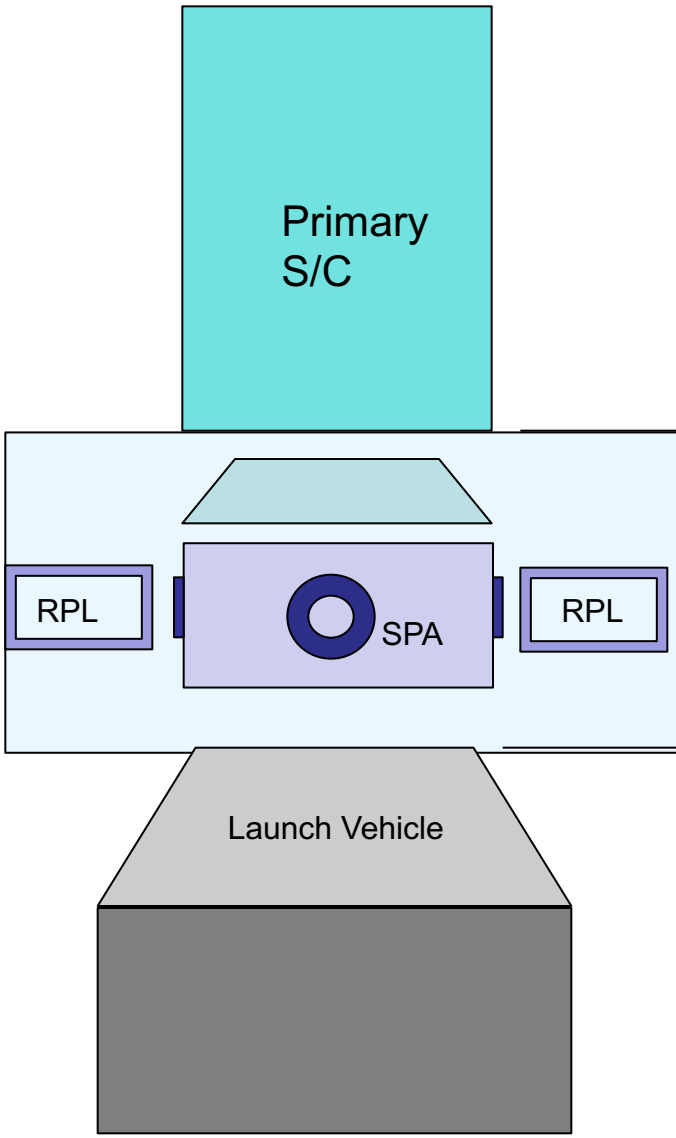
- Proposals should include sufficient S/C dimensions to validate fit within this PLF static envelope, including any close approaches.

- Figure has been reduced by 1.5" to account for a typical payload isolation system. If the Spacecraft is providing its own isolation system, 1.5 inches may be added to overall height shown.

5.92 AO-Provided Secondary Launch Services

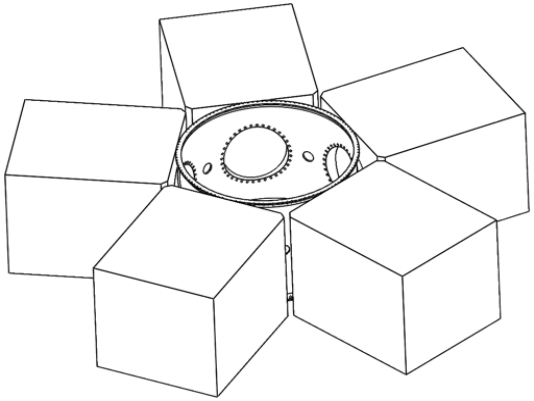
(AO-Provided Rideshare Access to Space LSP Procured)

ESPA Configuration

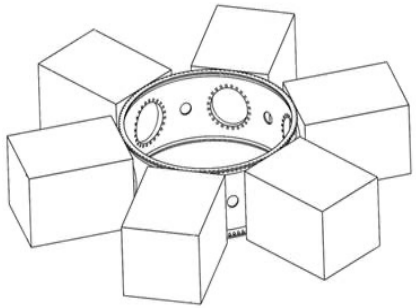


- LSP will procure the launch service for the Primary spacecraft and the ESPA ring through the Launch Service Task Order (LSTO) process
- LSP will coordinate the mission integration process with the Launch Service Contractor, the Primary spacecraft customer, and the SPA mission aggregator
- A Mission Aggregator will be identified that will coordinate the mission the integration process with the RPLs
- The Aggregator will be the interface between LSP and the RPLs
- There will an ICD between each of the RPL and SPA System
- The SPA and RPLs will be integrated into one assembly and delivered to Launch Services Contractor
- The Launch Service Contractor is responsible for the build and check out of the launch vehicle with NASA involvement/insight

ESPA type Interfaces

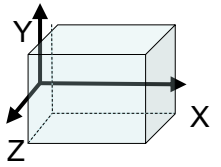


ESPA Grande



ESPA

ESPA	Max RPL Mass	Allowable RPL Volume	RPL Interface
ESPA Grande 5 Port	465 kg	42”x46”x38” Y, Z, X	24” circular
ESPA 6 Port	220 kg	24”x28”x38” Y,Z,X	15” circular



NASA will provide the Separation System as GFE: **RUAG PAS 381S (15”) for ESPA**
RUAG PAS 610S (24”) for ESPA Grande
PSC MkII MLB (15” or 24”)

Please see the NASA Science Mission Directorate (SMD) Launch Vehicle Secondary Payload Adapter Rideshare Users Guide. AO Library

RPL Do No Harm

All ESPA class RPL will be subject to a Do-No-Harm (DNH) assessment process to ensure that they will not pose a threat to the mission success of the Primary spacecraft or Launch Vehicle (LV) – Some general DNH considerations include:

- RPL Design
  - Design should follow the NASA RUG guidelines Link to item 6ain Program Library Proposal will include information
  - Include filled in for the *Rideshare Accommodations Worksheet Template* data associated with your proposals
  - Design must physically comply with the space allotted and remain constrained and sufficiently stiff to not make contact with launch vehicle or other spacecraft hardware during flight
  - Dynamic modes of the auxiliary payload must be sufficiently understood and communicated to ensure no detrimental dynamic loading onto the launch vehicle or primary spacecraft (guidance provided in the NASA RUG)
  - RPL must maintain integrity and not separate prematurely under worst case predicted loads and environments (acoustic, shock, vibe, thermal, depressurization)

RPL Do No Harm

- Flight Risks associated with guidance in the NASA RUG
  - Separation analysis must ensure no re-contact with the LV, Primary spacecraft, or other RPLs during RPL separation event(s)
  - RPL separation indications must be included in the LV telemetry stream
  - Mitigations are in place to ensure any potentially hazardous functions are redundantly inhibited until well after the RPL is clear of the LV, Primary spacecraft, or other RPLs
  - RPLs must not generate debris that may contact the LV, Primary spacecraft, or other RPLs
  - RPLs contamination sources must be understood and provided to the LV, Primary spacecraft, or other RPLs for impact assessment
  - RPLs must not generate environments (e.g. thermal, separation shock, etc.) which detrimentally impacts the qualification of the LV, Primary spacecraft, or other RPLs

RPL Do No Harm

- Launch Schedule Support
  - RPL integration schedules must support launch vehicle/primary payload integration schedules
  - RPLs must not impact the launch date for the primary mission in the event that the RPL is not able to support launch date – This is typically accomplished by having a mass simulator available and ready to integrate
  - RPLs must support the full launch window defined by the primary spacecraft

- Personnel Safety
  - RPLs must comply with applicable OSHA, DOT AFSPCMAN 91-710
  - RPLs must be stable and safe without services (power, commodities) once integrated

Please see the NASA Science Mission Directorate (SMD) Launch Vehicle Secondary Payload Adapter Rideshare Users Guide AO Library

Summary

- **It is the NASA 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:**

Shaun Daly
Mission Manager
NASA Launch Services Program Code VA-C
Kennedy Space Center, FL 32899
Phone: 321-289-6426
Email: shaun.daly@nasa.gov

NASA LSP is ready to respond to your mission specific questions.