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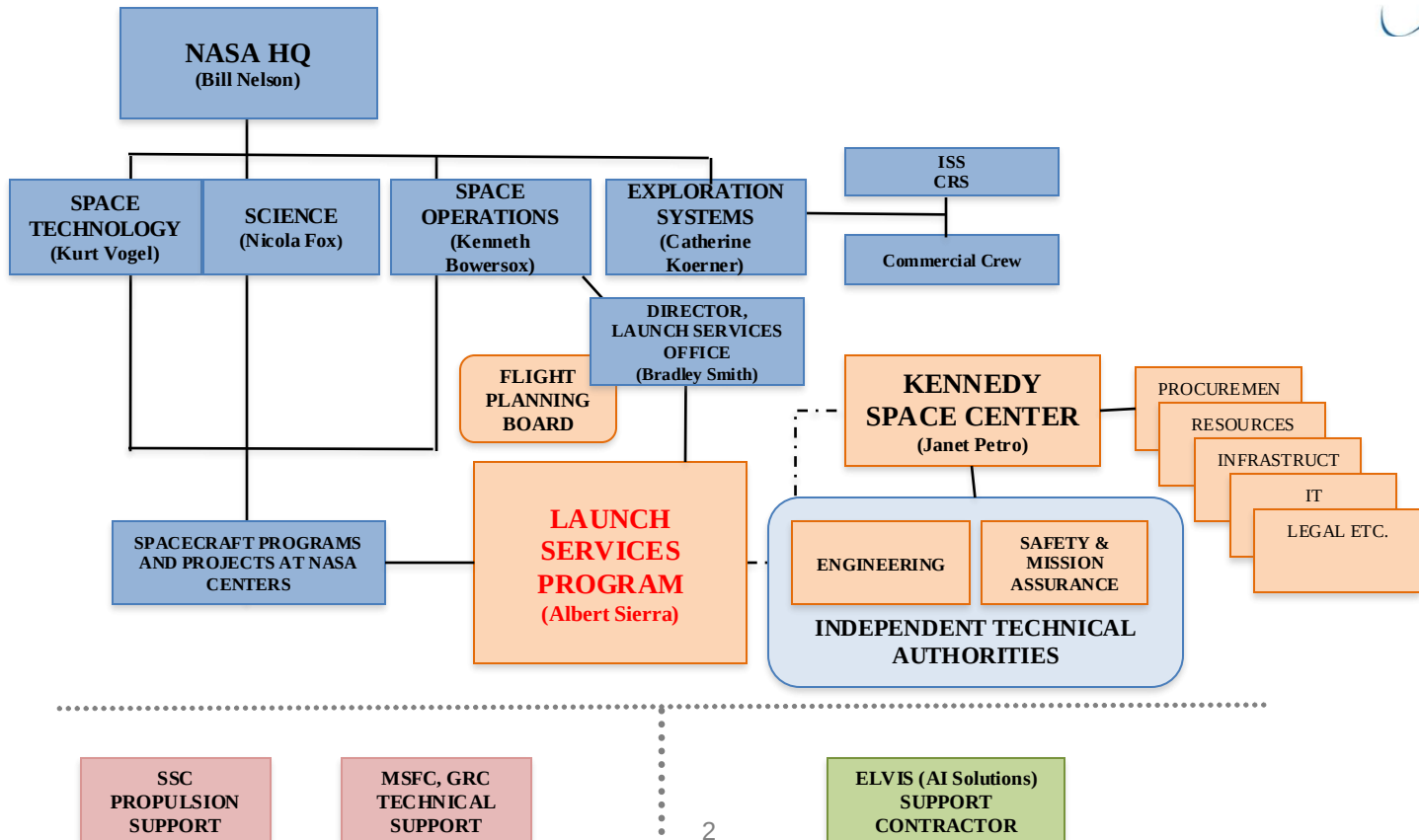
LAUNCH SERVICES 2023 ASTROPHYSICS PROBE EXPLORER (APEX) AO PHASE A KICKOFF

John Calvert
Flight Projects Office
Launch Services Program
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LSP Relationships (NASA HQ/SOMD/KSC)





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LSP Organizational Structure



LAUNCH SERVICES PROGRAM

Albert Sierra
Jenny Lyons



LAUNCH DIRECTOR
Tim Dunn / Denton Gibson



Launch Manifest Coordination



TECHNICAL INTEGRATION
Jorge Piquero

Risk Mgmt/Tech Policy & Business Development



VSFB PROGRAM REP
Daye Hoffman

VSFB Resident Offices & Program Support Coord



PROGRAM PLANNING
Lisa Haber

Strategic Planning & Policy



PROGRAM BUSINESS
Brian Smith / Lety Gomez



Contracts & Budgeting



FLIGHT PROJECTS
Diana Calero

Mission Management
Pre-Phase A-E



INFRASTRUCTURE MGMT
Ralph Mikulas

Ground Systems
Launch Site
Comm & Telemetry



FLEET & SYSTEMS MGMT
Denise Pham / Lori Ulrich

Fleet
Integration Engineering
Field Offices



FLIGHT ANALYSIS
Mike Carney / Brian Beaver

Flight Dynamics
Flight Structures and
Environments



CHIEF ENGINEER
James Wood



ENGINEERING
Bob Mott



CHIEF SAFETY OFFICER
Joe Dant



S & MA
Jessica Williams

Technical Authority



PROCUREMENT
Terry Crowley



RESOURCES
Josh Green



CHIEF COUNSEL
Joe Batey

Center Support

Matrixed Organizations



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What Does LSP Provide?



- Procurement and management of the launch service
- Coordination of mission-specific integration activities
- Technical insight of the launch vehicle production/test
- Oversight (approval) of mission unique launch vehicle hardware/software development
- Launch campaign/countdown management and formal readiness reviews
- Payload-processing accommodations



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Launch Service for this AO



- NASA provided primary launch service
 - Launch services expected to be provided under NLS II Contract or follow-on
 - Domestic launch vehicle certified as category 1, 2 or 3 per NPD 8610.7D
 - For more details reference the *NASA Launch Services Program Information Summary* document in the 2023 Astrophysics Probe AO library
 - Alternative Access to Space arrangements are NOT available under this AO



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NASA Provided Primary Launch Service



- SMD/APEX will provide a baseline expendable launch vehicle service (outside of PI-Managed Mission Cost) including all standard and some mission unique launch service costs.
 - Roughly equates to “intermediate” class vehicle with a standard sized 5m payload fairing (PLF)
 - Missions requiring a higher performance (i.e, “heavy” class) and/or larger volume PLF will be subject to cost cap adjustments between \$50-65M
- For purposes of this APEX Phase A CSR, the following launch vehicle dispersions shall be assumed:
 - Low Earth Orbit (LEO)
 - Perigee: +/-20 km
 - Apogee: +/-20 km
 - Inclination: +/-0.1 deg
 - High Energy (C3)
 - 0.1 km²/s²

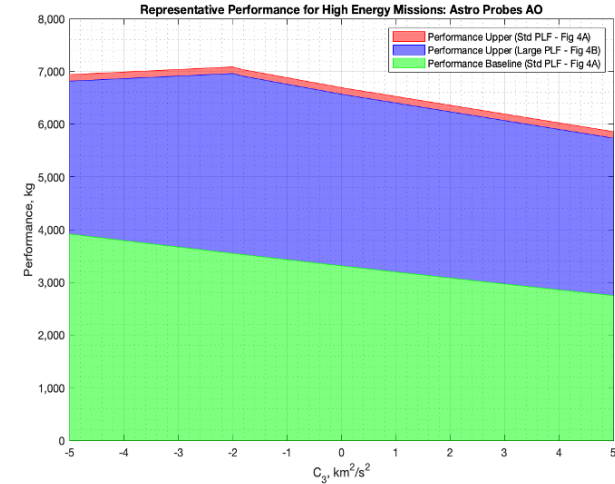


Figure 1: Constraining High Energy Performance Curves

C_3 , km ² /s ²	Baseline	Upper (Standard Fairing)	Upper (Large Fairing)
-5	3915 kg	6935 kg	6810 kg
-2	3545 kg	7085 kg	6960 kg
5	2745 kg	5855 kg	5730 kg



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AO Risk Assessment for Launch Services



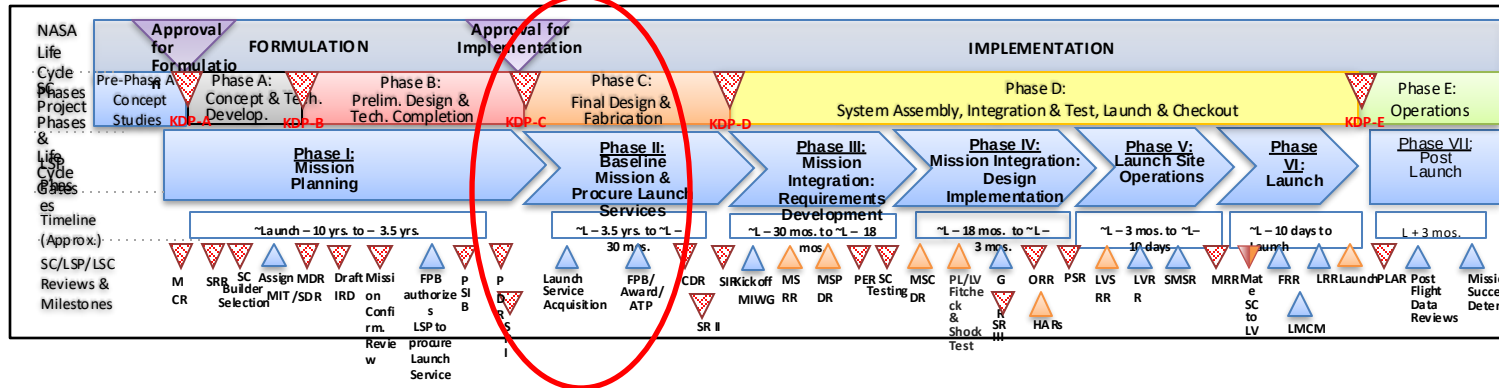
- LSP's focus will be on providing a "Launch Service Risk Assessment" in accordance with the Launch Service Information Summary and providing a Risk input based upon the level of LV compatibility for each proposed SC
- A rough definition of risk is provided below; however, these rankings are somewhat subjective rankings:
 - **LOW Risk** – Easily compatible with a number of LV providers in the contract pool; Requirements enveloped by contracted LV provider capabilities
 - **MEDIUM Risk** – Marginally compatible, the key here will be to highlight looming envelope exceedances that may eliminate some or most LV providers; Challenging orbital insertion requirements or performance needs
 - **HIGH Risk** – Not compatible with any LV providers or marginally compatible with only one LV provider, forcing a sole source acquisition



NASA Launch Services Contracting



- The acquisition of a NASA-provided 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 II (NLS-II) contract.
 - Current NLS-II order period ends June 2030, with flyout by end of CY32
 - Launch dates beyond 2032 would potentially fly under a new follow-on contract
 - Domestic launch vehicle certified as category 1, 2 or 3 per NPD 8610.7D





NASA Launch Services II Contract



- The NLS II Contract is LSP's primary method to acquire all classes of Category 2 and Category 3 commercial launch services for spacecraft customers
- NLS II Provides NASA with domestic launch services that are safe, successful, reliable, and affordable
- Provides services for both NASA-Owned and NASA-Sponsored payloads through multiple Indefinite Delivery Indefinite Quantity (IDIQ) Launch Service Task Order (LSTO) contracts with negotiated Not To Exceed (NTE) Prices
- Provides services on a Firm-Fixed-Price (FFP) basis
 - Incorporates best commercial practices to the maximum extent practical
 - Includes Standard and Non-Standard services
 - Mission unique modifications
 - Special studies
- Allows LSP to turn on a Task Assignment or Non-Standard Service at any time for analyses



NASA Launch Services Contract (cont.)



- Launch Services Risk Mitigation Policy for NASA-owned and/or NASA-sponsored Payloads/Missions can be found under NPD 8610.7. Document can be found at <http://nodis3.gsfc.nasa.gov>
 - Risk Category 1: Low complexity and/or low cost payloads-Classified as Class D payloads pursuant to NPR 8705.4
 - Risk Category 2: Moderate complexity and/or moderate cost payloads-Classified as Class C payloads and, in some cases, Class B payloads, pursuant to NPR 8705.4
 - Risk Category 3: Complex and/or high cost payloads-Classified as Class A payloads and, in some cases, Class B payloads, pursuant to NPR 8705.4
- NLS II Launch Service Schedule and Costs
 - Acquisition process typically begins at approximately L-36 months
 - Authority to Proceed (ATP) concurrent with Task Order Award at approximately L-30 months



Launch Service Budget



- Under a NASA provided Launch Service for this AO, a standard launch service includes:
 - The launch vehicle, engineering, analysis, and minimum performance standards and services provided by the contract.
 - Mission integration
 - Launch Site Payload Processing
 - Range Support
 - Down Range Telemetry support (launch vehicle only)
 - Standard Mission Uniques – 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 trajectory analysis
 - » Payload isolation system
 - » T-0 Grade B GN2 or pure air purge
 - » ISO 14644-1 Class 7 (Class 10K) integration environment



Launch Delays



- Each Provider has their own unique Launch Delay Table
 - Delay terms are identical for both parties (Contractor/NASA)
 - No-fault Launch delays
 - » Include: range constraints, floods, acts of God, strikes and other conditions
 - » No adjustment made to mission price
 - » No limit on number of days
- For the remaining delay cases grace days are based on sliding scale for both Contractor and NASA delays
 - 150 days of grace at ATP through L-24
 - Sliding down to 7 days of grace at L-10 days
- For limited launch periods (i.e., Planetary), there are no grace days available and delays outside of the defined launch period are subject to equitable adjustment



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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.

LSP POC for 2023 Astrophysics Probe AO:

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