NASA
Launch Services Program

2018 Heliophysics Technology Demonstration (TechDemo)
Mission of Opportunity (MO) SALMON-3 PEA L

Pre-Proposal Conference

AUGUST 24, 2018

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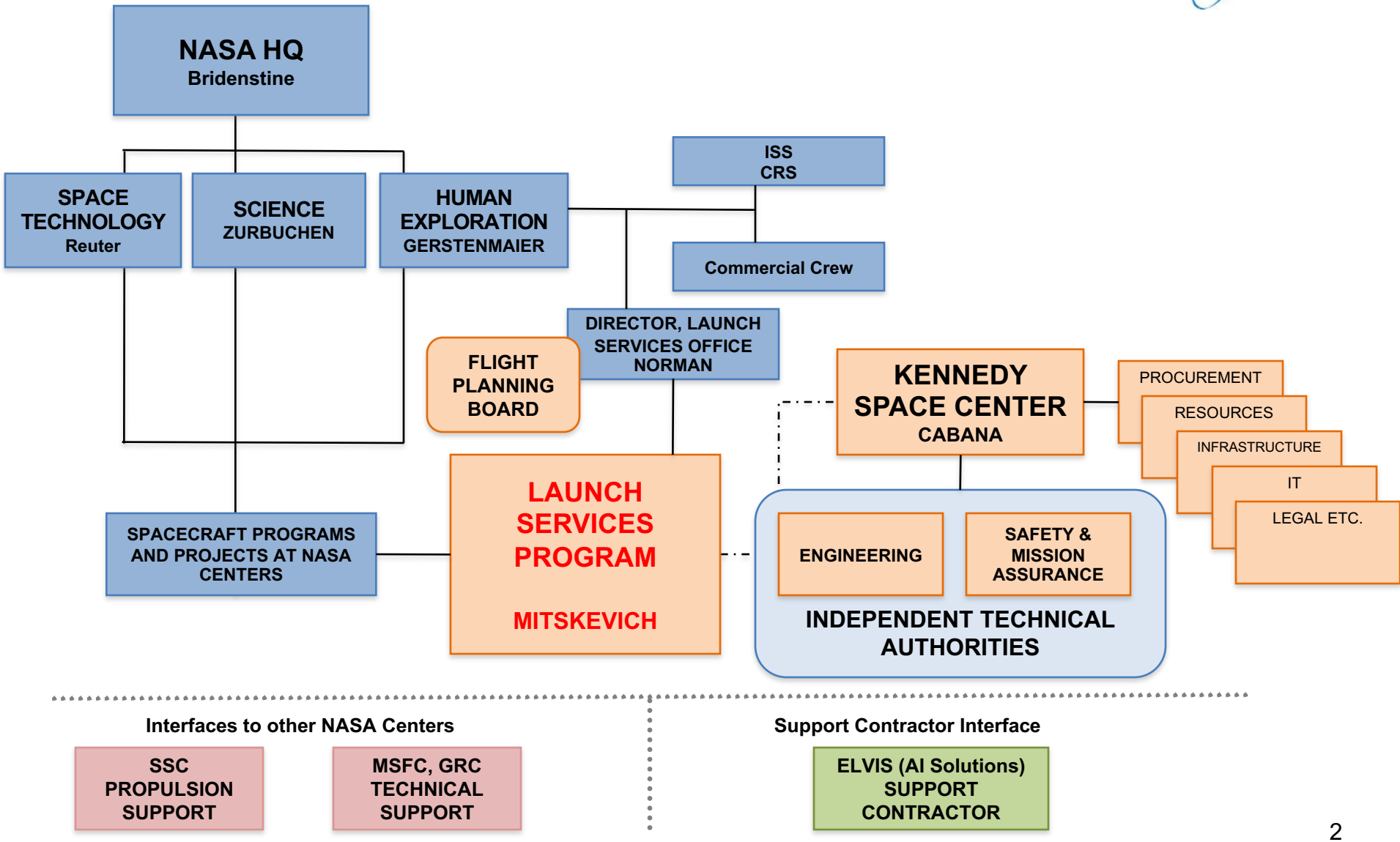
Flight Projects Office

Launch Services Program Relationships (NASA/HEOMD/KSC)

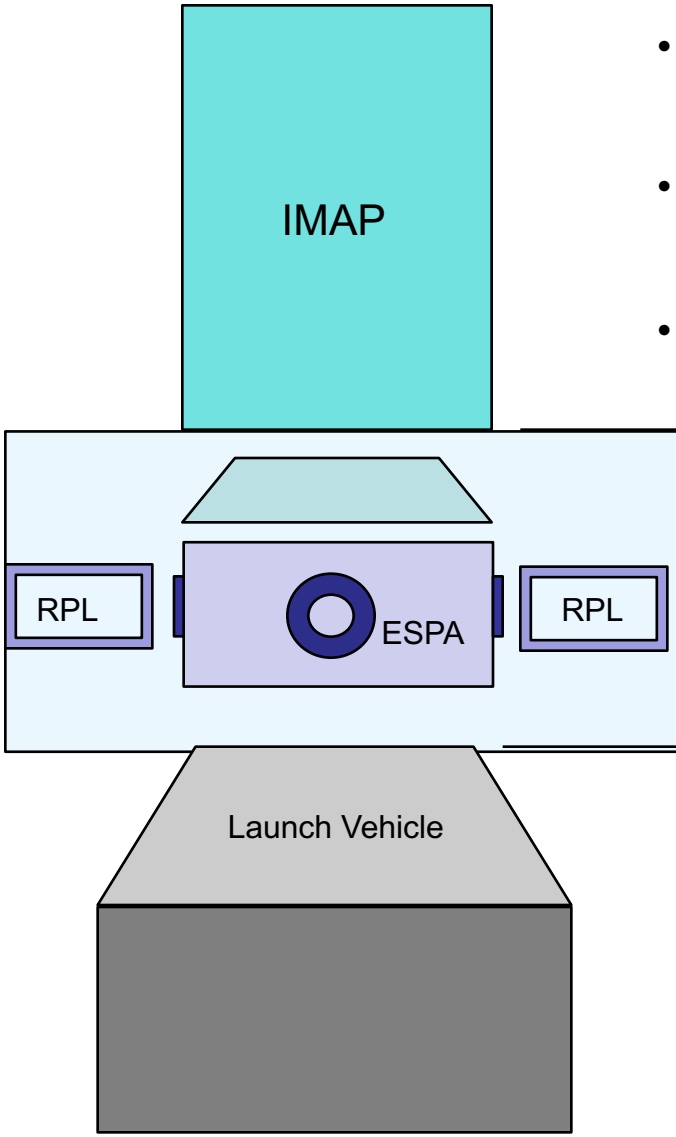


Launch Services Program

The Launch Services Program provides

- Management of the launch service
- Technical oversight of the launch vehicle production/test
- Coordination and approval of mission-specific integration activities
- Mission unique launch vehicle hardware/software development
- Payload-processing accommodations
- Launch campaign/countdown management

IMAP/ESPA Configuration

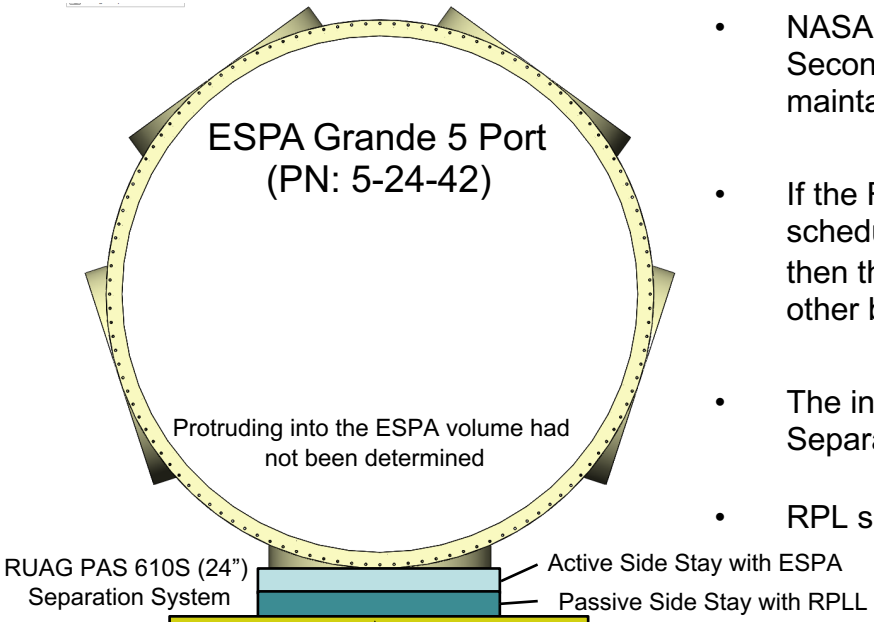


- Launch Services Program is responsible for the mission success of delivering IMAP to orbit
- IMAP to works with LSP and Launch Vehicle Provider during standard integration process
- The IMAP Launch Services and ESPA to be procured during IMAP LSTO process

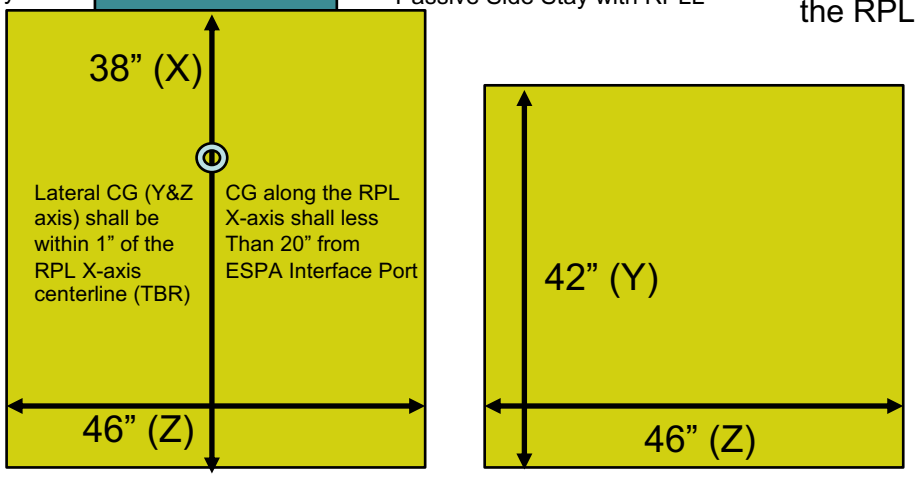
- A Mission Aggregator will be identified that will work the integration process with the RPLs
- The Aggregator will be the interface between LSP and the RPL
- There will an ICD between each of the RPL and ESPA System
- The ESPA and and RPL will be integrated into one model and submitted to Launch Services Contractor

- Launch Services Provide is responsible for the build and check out of the launch vehicle with NASA involvement.

ESPA Interface



- NASA’s Mission Specific Evolved Expendable Launch Vehicle Secondary Payload Adapter System Interface Specification maintains the RPL requirement for the mission
- If the RPL is unable to meet the required mass properties, milestone schedule, or is determined by NASA to be unacceptable for launch, then the RPL may be replaced with equivalent mass simulator of other back-up RPL
- The interface to the ESPA will be a RUAG PAS 610S (24” Separation System
- RPL shall not exceed a mass of 320kg
- If RPL requires a Isolation System it shall be included in the RPL useable volume and procured by the RPL



RPL Usable Volume

- NASA will be providing the following
  - 42” Five Port ESPA Grade Ring
  - Mass Simulators as Government Furnished Equipment (GFE) for each RPL
  - RUAG PAS 610S (24” Separation System for each RPL
  - Electrical Flight Disconnects for each RPL

RPL Do No Harm

Auxiliary Payload Do-No-Harm assessment process that would apply to RPL specifically

- RideShare Payload Design
  - Design should be done to Aerospace standards including appropriate safety factors for tested and untested hardware.
  - 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
  - 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
  - Separation analysis must ensure no re-contact with the launch vehicle or other spacecraft during RPL separation event(s)
  - Separation indication is in place to confirm the timing of RPL separation
  - Mitigations are in place to ensure any potential hazards to launch vehicle hardware or other spacecraft hardware remain secure throughout flight
  - Instrumentation is considered as needed to verify critical RPL related parameters post-flight
  - RPL must define thermal properties for impact assessment by LV & other SVs
  - RPL must not generate debris that may contact LV or other SVs and contamination sources must be understood and provided to LV/ other SVs for impacts assessment
  - RPL must not generate environments (e.g. separation shock) which detrimentally impacts the qualification of launch vehicle or spacecraft hardware

RPL Do No Harm

- Launch Schedule Support
  - RPL integration schedule must support launch vehicle/primary payload integration schedules
  - RPL must not impact the launch date for the primary mission in the event that the RPL is not able to support launch date. Typically accomplished by having a mass simulator(s) 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.

SMD Documents

Applicable Documents	
AFSPCMAN 91-710	Range Safety User Requirements Manual Volume 3 – Launch Vehicle, Payloads, and Ground Support Systems Requirements
NPR 8715.6 NASA	Procedural Requirements for Limiting Orbital Debris
NASA-STD-6016	Standard Materials and Processes Requirements for Spacecraft
Reference Documents	
EELV RUG	Evolved Expendable Launch Vehicle Rideshare User's Guide (SMC/LE)
TOR-2016-02946	Rideshare Mission Assurance and the Do No Harm Process – Aerospace Report
GSFC-STD-7000	General Environmental Verification Standard (GEVS) for GSFC Flight Program and Projects
MMPDS	Metallic Materials Properties Development and Standardization
MIL-HDBK-5	Military Handbook 5, Metallic Materials and Elements for Aerospace Vehicle Structures
SMD EELV SIS	Evolved Expendable Launch Vehicle Standard Interface Specification

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:

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