Decadal Survey Multi-mission Studies

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Background and Context

- Multi mission studies address issues that affect multiple missions.
- Decadal Survey Systems Engineering Working Group was established in October 2008. The charter includes:
  - *Identify technical infrastructure and infrastructure concerns common to multiple missions. Conduct studies to identify and evaluate solutions, including changes or upgrades to existing systems or new system development.*
  - *Identify and investigate cross mission synergies (both scientific and technical). Identify and evaluate options for risk reduction and implementation.*
- The SEWG includes members from LaRC, GSFC, and JPL. Current members are: Chris Edwards (LaRC), Stephen Hall (LaRC), Charles Whetsel (JPL), Tony Freeman (JPL), Bernie Graf (GSFC), Hina Kazmi (GSFC), and Nick Speciale (GSFC).
- The SEWG will be conducting the multi-mission studies

Decadal Survey Missions Systematic or Multi-Mission Studies

1) Downlink and Ground Network requirements analysis and assessment
2) Data standards and Data System planning for Decadal Survey Missions– now being led by Martha Maiden and the Data Systems Working Group
3) Common spacecraft for multiple missions
4) Technology independent review teams for lasers, radars, and other instrument types (for ICESAT & DESDyni) – being organized by Bernie Graf
   - *Establish a review process that brings in independent expertise to examine and assess the technology being proposed for the mission; its maturity and how well it meets the needs of the mission, including cost & schedule. Task shared between ESM-PO and ESTO*
5) Access to space: DPAF for EELV and potential co-manifests
6) Real time data evaluation— Assess the need for real time data and potential implementations

Downlink and Ground Networks Analysis

- Objectives
  - *Determine downlink volumes and rates for the Tier 1/Tier 2 missions and compare to existing NASA infrastructure. Summarize the anticipated DS mission telecommunications requirements (data rates, downlink requirements, ground network transmission requirements) and assess those requirements against existing and planned infrastructure. Identify infrastructure improvements required to meet the anticipated future loads. Identify and evaluate options, both government and commercial to meet the future needs. Evaluation criteria shall include cost, capacity, timeliness.*
- 2009 plan
  - *Collect requirements from Tier 1 and Tier 2 POC's. Summarize on timeline. Meet with representatives from Space and Ground Networks Projects to assess current infrastructure capabilities. Identify options for upgrades, and develop cost estimates and procurement timelines for those upgrades.*
- Product/Deliverable
  - *Report in June 2009*

Common Spacecraft for Multiple Missions

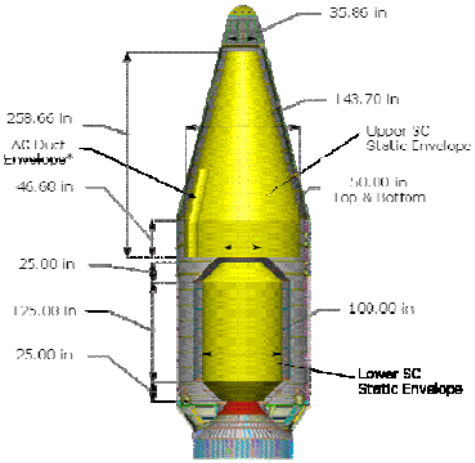
- Objective
  - *Determine whether the Program can achieve significant savings and risk reduction by developing and purchasing common spacecraft for a block buy. Evaluate the proposed instrument and operations concepts for all Tier 1 and Tier 2 missions. Develop one or two common specifications (two discrete sizes may be necessary).*
- 2009 Plan
  - *Collect instrument accommodation requirements and ops concepts from Tier 1 and Tier 2*
  - *Develop draft spacecraft specifications*
  - *Conduct RFI or release RFP for study contracts*
  - *Develop Procurement approach*
  - *Generate cost estimates*
  - *Develop strawman management approach*
- Product/Deliverable
  - *Procurement package for review in early summer 2009*

Technology Readiness and Mission Risk Assessment

- Objective
  - *ESD (and through them the ESM PO) needs to assess the technology readiness of all of the mission concepts. A technology readiness review panel will be chartered for each major technology. The charter for this panel is to do a high level assessment of each mission concept, at Mission Concept Review and Mission Definition Review, and collect and conduct specific independent technology assessments as required. These panels will evaluate the selected designs focusing on the requirements, the planned development, risk reduction activities, development schedule, and the timeliness of the progress.*
- 2009 Plan
  - *Charter teams for ICESAT laser assessment (Feb 2009); DESDynI laser assessment (September 2009) and DESDynI radar assessment (September 2009)*
- Product/Deliverable
  - *Review team reports within 30 days of reviews*

Dual Payload Attach Fitting for EELV and Co-Manifest Options

- Objectives
  - *Determine the cost to develop a DPAF for the Atlas V (from Launch Services). Evaluate co-manifest opportunities to determine which are realistic and what total launch costs are*
- 2009 Plan
  - *Atlas V DPAF is at PDR maturity. Launch Services has a proposal from Lockheed Martin for DPAF development. ESM-PO has developed a stimulus package input for the DPAF development from Launch Services' inputs*
  - *Evaluate Tier 1 and Tier 2 mission orbits, launch masses, and launch configurations to identify candidate co-manifest opportunities*
  - *Coordinate with Launch Services to evaluate non- earth science co-manifest opportunities*
- Products/Deliverables
  - *September 2009 report with DPAF status and evaluation of co-manifest opportunities, including a risk assessment*



Dual Satellite Subsystem (DSS)

FY09/10 Decadal Stimulus Package Input

Darren Bedell (KSC-LSP)
Nicholas Speciale (ESM-PSE)

February 3, 2009

Real Time Data Implementation Options

- Objectives
  - *Develop a strategy for real time data for the Decadal Survey missions. Work with applications community to identify real time data requirements on Decadal Survey missions (note that these requirements are not part of mission baselines at present). Evaluate implementation options with respect to total cost, risk, and performance.*
- 2009 Plan
  - *Coordinate with Applications Science in ESD and NASA Direct Broadcast- Direct Readout managers*
  - *Evaluate science and applications benefits for real-time data from Tier 1 and Tier 2 missions*
  - *Direct broadcast has been a standard capability for POES, EOS and the upcoming NPP/NPOESS Missions*
  - Develop cost estimates for implementing real time data (DB-DR + others)
- Product/Deliverable
  - *September 2009 report on benefits of real time data, implementation options and costs, and recommendations.*