



# ***NASA Launch Services Program***

**SMEX 10/11 Phase A Kick-off Meeting  
21 Nov 2003**

**Tom De Laet  
NASA/KSC Launch Services Program  
Systems Engineering and Integration Branch**



# Launch Services Highlights and Considerations for Phase A

- **NASA policy for payload processing facilities has changed – was a Government facility, now is a commercial facility. Costs reflected in launch service cost figures.**
- **Try to design to existing LV capabilities – mission unique modifications get expensive very quickly.**
- **Access tower for Taurus does not exist, but concept has been assessed and associated cost has been estimated – not trivial.**
- **Helpful Web sites:**
  - KSC ELV Performance Web Site: <http://elvperf.ksc.nasa.gov>
  - KSC ELV Payload Planner's Guide: <http://elvppg.ksc.nasa.gov>
  - To obtain access password for above sites, contact:
    - » Pamela Pugmire
    - » Email: [PugmiPB@kscems.ksc.nasa.gov](mailto:PugmiPB@kscems.ksc.nasa.gov) for PPG passwords
    - » Email: [ELVISWEB@ai-solutions.com](mailto:ELVISWEB@ai-solutions.com) for ELV Performance access issues
    - » Phone: (321) 476-3714



# Launch Services Cost (\$ in Millions) Nov 2007 Launch

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Launch Services	FY05	FY06	FY07	FY08	Total Cost
SELVS-KSC Pegasus (VAFB)	1	12	8	9	30
SELVS-KSC Pegasus (East Coast)	1	13	8	10	32
SELVS-KSC Pegasus (Equatorial)	1	14	8	11	34
SELVS-KSC Taurus (VAFB)	1	22	11	14	48
SELVS-KSC Taurus (CCAS)	1	22	11	15	49
SELVS-KSC Option Taurus(equatorial)	1	24	13	17	55



# Launch Services Cost (\$ in Millions)

## Nov 2008 Launch

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Launch Services	FY06	FY07	FY08	FY09	Total Cost
SELVS-KSC Pegasus (VAFB)	1	13	8	9	31
SELVS-KSC Pegasus (East Coast)	1	14	8	10	33
SELVS-KSC Pegasus (Equatorial)	1	15	8	11	35
SELVS-KSC Taurus (VAFB)	1	23	10	15	49
SELVS-KSC Taurus (CCAS)	1	23	10	16	50
SELVS-KSC Option Taurus(equatorial)	1	25	12	18	56



# Pegasus/Taurus Integration Schedule Spacecraft Input Timelines

<u>Integration Products</u>	<u>Input required from Spacecraft Team</u>	<u>Input from Spacecraft Team Due:</u>
ICD/Mission Specification/Verification Matrix .....	Interface Reqmts Document (IRD)	ATP (L-23mo)
<b><u>Loads Analyses</u></b>		
• Spacecraft Environmental Testing Plans.....	Testing Plans	Test-9 weeks
• Spacecraft Test Data Summary.....	Test Data or Report (if available)	Test Completion + 4 week
• Final Design Loads Cycle (FDLC) .....	CDR Pre-Test Spacecraft Dynamic/FEM Model and Mass Properties Report	L-70 weeks
• Verification Loads Cycle (VLC) .....	Test-verified (correlated) Spacecraft Model and Mass Properties Report	L-24 weeks
<b><u>Trajectory/Performance Analyses</u></b>		
• Preliminary Mission Analysis (PMA).....	Best avail mission reqmts (e.g., S/C mass, orbit, tracking) and Mass Prop Report	L-60 weeks
• Final Mission Analysis (FMA).....	Final mission reqmts including L-windows and Mass Prop Report	L-26 weeks
• Final Mass Properties Report.....	Final Mass Properties Report	L-26 weeks
<b><u>Other Engineering/Analyses</u></b>		
• Mission Unique Hdwr Development (preliminary).....	Spacecraft Mechanical/Elect Interface Drawings	~L-90 weeks (PDR)
• Mission Unique Hdwr Development (final).....	Update with CDR info	~L-70 weeks (CDR)
• Spacecraft Separation Analysis (initial) .....	Initial Nutation Time Constant input	L-60 weeks
• Spacecraft Separation Analysis (Final) .....	Final Nutation Time Constant input	L-26 weeks
• Integrated Thermal Analysis (ITA).....	Spacecraft Geometrical/Thermal mathematical models	L-60 weeks
• RF Compatibility Study .....	Input for RF application for radiating on-site	L-8 weeks
• <b>Launch Vehicle Insignia (Project/NASA Logo) .....</b>	<b>Final drawings</b>	<b>L-43 weeks</b>



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# Pegasus/Taurus Integration Schedule Spacecraft Input Timelines (continued)

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<b>Integration Products</b>	<b>Input required from Spacecraft Team</b>	<b>Input from Spacecraft Team Due:</b>
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## Launch Site Related Documentation

- |   |  |            |
|---|--|------------|
| • Spacecraft Launch Site Test Plan .....                | Testing plans at launch site                         | L-34 weeks |
| • Spacecraft Integrated Test Procedures.....            | Testing Requirements that include both SC and LV     | L-20 weeks |
| • Spacecraft Launch Site Standalone Test Procedures ... | Standalone Test Procedures                           | L-18 weeks |
| • Spacecraft-to-Aircraft wiring diagrams .....          | LV Flight Harness/Spacecraft GSE wiring requirements | L-70 weeks |
| • Launch Site Support Plan (LSSP) – KSC document .....  | Launch Site Support Requirements                     | L-60 weeks |

## Range Safety Documentation - Spacecraft Missile System Prelaunch Safety Package (MSPSP)

- |                                      |                        |                             |
|--------------------------------------|------------------------|-----------------------------|
| • Draft Spacecraft MSPSP .....       | EWR 127-1 requirements | PDR-45 days                 |
| • Preliminary Spacecraft MSPSP ..... | EWR 127-1 requirements | CDR-45 days                 |
| • Final Spacecraft MSPSP .....       | EWR 127-1 requirements | Spacecraft arrival -45 days |



# KSC Launch Services Program Proposal Evaluation Input

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Attachment 1

AO Proposal Evaluations  
KSC ELV Launch Services Evaluation Input

Proposal Name: \_\_\_\_\_  
 Proposal #: \_\_\_\_\_  
 Evaluator POC: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Technical Evaluation:**

**Overall Assessment** – given the groundrules in the AO, is the proposed LV concept feasible for this application?

Yes     No     Yes with comments – see details below

**LV Performance:**  Area of Concern

Proposed LV configuration: \_\_\_\_\_

Proposed Mass-to-Orbit Requirements:

Mass:  kg    Apogee:  km    Perigee:  km    Incl:  deg

Does the proposed LV configuration have adequate performance capability?  Yes  No

If yes, how much performance margin is available?  kg     %

Comments/Issues/Concerns: \_\_\_\_\_

**LV-to-SC**  Area of Concern

**Interfaces:**

Payload Fairing Envelope – adequate envelope for proposed SC?  Yes  No  Unclear

Proposed Mechanical Interface (LV/SC Adapter)?

Standard Interface     Custom Adapter Req'd     Unclear

Mission Unique Modifications Required?

Yes     No     Unclear

Attachment 1

AO Proposal Evaluations  
KSC ELV Launch Services Evaluation Input

Comments/Issues/Concerns: \_\_\_\_\_

**LV Cost Assessment:**  Area of Concern

Is LV cost profile consistent to that given in the AO LV Appendix?

Yes     No     Unclear

If mission unique mods have been identified, have they been properly accounted for in cost profile?

Yes     No     Unclear

Comments/Issues/Concerns: \_\_\_\_\_

Area of Concern

Comments/Issues/Concerns – general in nature and/or with other sections of the proposal:

\_\_\_\_\_



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# Launch Services Program Program Planning Office

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## Point of Contact:

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