

National Aeronautics and Space Administration



NASA/JAXA Exploration Collaboration Team F2F

Space Launch System



August 28 - 29, 2013

NASA/JAXA F2F

Agenda – Wednesday, August 28th



7:45	JAXA Visitor Pick-up @ Holiday Inn Express & Suites/Huntsville and Hampton Inn & Suites/Huntsville/Research Park	Escorts
8:00	Visitor Badging @ RSA Visitors Center	Escorts
9:00-9:30	Welcome/Introductions/Meeting Objectives	Creech & Kobayashi
9:30-9:45	SLS Program Progress Update	Creech
9:45-10:00	JAXA H-X Recent Activities	Kobayashi
10:00-12:00	Study Plan	Greene/JAXA
12:00-1:00	Lunch @ 4203 Cafeteria	All
1:00-1:30	JAXA Isp Trade	JAXA
1:30-2:00	NASA Proposal of H-X Flight Test Opportunity	Crumbly
2:00-3:00	Propulsion Components Approach Planning	Devine/JAXA
3:00-3:30	Management Plan	Smith/JAXA
3:30-5:00	Splinter Working Sessions	All
5:00	Adjourn Day 1	All
6:30	Group Dinner @ Below the Radar	All

NASA/JAXA F2F

Agenda – Thursday, August 29th



8:00	JAXA Visitor Pick-up @ Holiday Inn Express & Suites/Huntsville and Hampton Inn & Suites/Huntsville/Research Park	Escorts
8:30-9:30	Splinter Session Outbriefs	
9:30-12:00	Splinter Sessions	All
12:00-1:00	Lunch @ 4203 Cafeteria	All
1:00-3:00	Tours <i>(West Test Area Engine Test Stand; East Test Area: TS116 (SMAT), 4550; 4705 (EFT-1 MSA))</i>	All
3:00-3:30	Wrap-up and Adjourn	All
3:30	Return JAXA Visitors to Holiday Inn Express & Suites/Huntsville and Hampton Inn & Suites/Huntsville/Research Park	Escorts



SLS Program Progress Update

Recent Progress



April

- Exploration Systems Development Cross-program System Definition Review Complete
- J-2X Development Engine 10002 Hot Fire Testing Complete in A-2 Test Stand
- Stage Tank Enhanced Ring Weld Tool and Gore Weld Tool Installation Complete at MAF
- RS-25 Preliminary Program Support Checkpoint Complete
- SLS Block I (EM-1/-2 Configuration) Booster Contract Definitized

Gore Weld Tool



May

- Stennis Space Center Test Stand A-1 Reconfiguration and Thrust Vector Control Installation Complete



J-2X Engine Testing Continues

Recent Progress (cont'd)



June

- RS-25 Engine Controller Unit and Software Preliminary Design Review Complete
- Vertical Weld Center Tool Installation Complete at MAF
- SLS Block I Booster Integrated Baseline Review Complete
- J-2X Development Engine 10002 Test in A-1 Test Stand
- First J-2X Development Engine Gimbal Test
- MPCV-to-Spacecraft Adapter Fit Check
- SPIO Preliminary Design Review Complete
- Stages Vertical Assembly Center Foundation Installation Complete, Start Cure at MAF

J-2X
Engine
Testing



Spacecraft Adapter
Ring Fit Check



Segmented Ring Tool
for Core Stage
Construction

Recent Progress (cont'd)



July

- J-2X Development Engine 10002 Test on A-1 Test Stand
- First Core Stage Barrel Panel Welded at MAF
- GSDO Command, Control, Communications, and Range Integrated Program Review Readiness Assessment Complete
- 2014 EFT-1 MSA Delivered to MSFC
- ***SLS Preliminary Design Review Complete***



First Core Stage Barrel Panel Welded at MAF

August

- J-2X Development Engine 10002 Hot Fire Testing in A-1 Test Stand Continues; Development Engine 10003 in Final Assembly
- SLS Block I Core Stage Engine Contract Definitized

EFT-1 MSA



J-2X Testing Continues

A photograph of a Space Shuttle SLS (Space Launch System) being launched. The rocket is white with blue and orange accents, and is surrounded by a large plume of white smoke and fire. The launch is taking place on a launch pad with a tall metal structure on the left. In the foreground, there are several large pipes with green arrows and the text "N2O4 400 PSI" written on them. The sky is blue with some clouds.

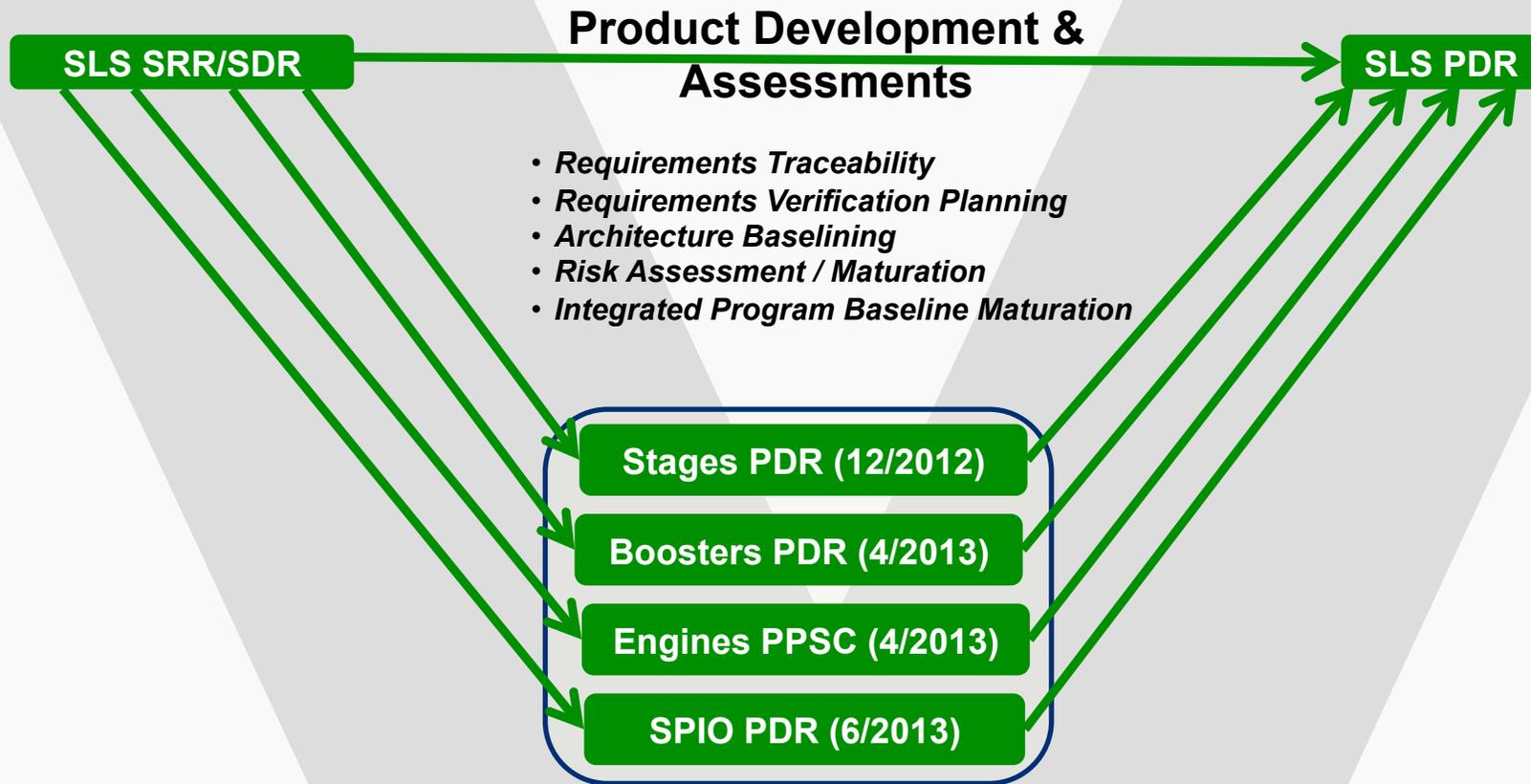
***SLS Preliminary
Design Review
Complete***

SLS Program Life Cycle



NASA Life Cycle Phases	Approval for Formulation			FORMULATION	Approval for Implementation		IMPLEMENTATION	
Program Life Cycle Phases	Pre-Phase A: Concept Studies	Phase A: Concept & Technology Development	Phase B: Preliminary Design & Technology Completion	Phase C: Final Design & Fabrication	Phase D: System Assembly, Int. & Test, Launch & Checkout	Phase E: Operations & Sustainment	Phase F: Closeout	
Program Life Cycle Gates and Major Events	KDP A	KDP B	KDP C	KDP D	KDP E	KDP F		
Agency Reviews	FAD	Draft PCA	Final PCA	Launch	End of Missions	Final Archival of Data		
Human Space Flight Project Reviews	Draft Project Requirements	Preliminary Program Plan	Baseline Program Plan					
Agency Reviews	ASM			WE ARE HERE				
Human Space Flight Project Reviews	MCR	SRR/SDR Steps 1 & 2	PDR	CDR	DCR	SIR	(pre-)FRR	PLAR
Human Space Flight Project Reviews							DR	

SLS Element PDRs



- ◆ **Element-level PDRs aligned with Program-level PDR**
- ◆ **Element PDR data integrated into Program PDR**

SLS Design Is Technically Sound



- ◆ **From Concept to Preliminary Design in Less Than 2 Years**
- ◆ **Ready to proceed to Implementation (Phase C) following Key Decision Point (KDP-C) approvals**
 - Marshall Space Flight Center Management Council (CMC)
 - Human Exploration and Operations Mission Directorate Program Management Council (DPMC)
 - Agency Program Management Council (APMC)



“Stack it. I’m ready.”
— Tony Antonelli, JSC Crew Office



***Potential
H-X Flight
Demonstration
Opportunities***

Potential Demonstration Opportunities



Options for H-2 or H-X Flight Tests

- **Liquid acquisition device (US or Japanese)**
- **Advanced cryoinsulation**
- **Liquid measurement sensors (settled/unsettled)**
- **Active/passive thermal venting**
- **Demonstration of low propellant engine restart**
- **Demonstration/instrumentation of metallic nozzle extension**
- **Other?**