



Ares Preliminary Design Review

(PDR) Kick-off: The Project initiated a significant milestone with the kick-off of the Ares I Preliminary Design Review (PDR) on July 28. The PDR Kick-off was conducted at the Space & Rocket Center's Davidson Center in Huntsville, AL. Detailed Design Presentations (DDPs) were conducted on July 29 – August 1. The DDPs focused on requirements and engineering, internal and external interfaces, integrated performance, avionics and software, crew safety and reliability, operability and supportability, test and verification, and overall project risk. There was broad participation from across the Agency including the Standing Review Board and other independent reviewers. The PDR will culminate with an assessment of the Project's readiness to proceed to Critical Design Review (CDR). The PDR Pre-Board is scheduled for September 3, with the PDR Board on September 10.



Deceleration Subsystem (DSS) Drogue Parachute Drop Test (DDT-1)

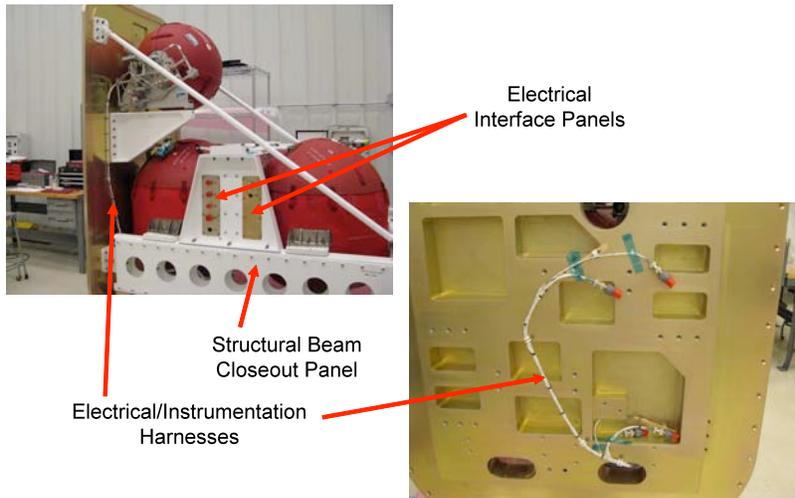
The first drop test of the new Ares I first stage booster reentry drogue parachute was successfully conducted at the U.S. Army's Yuma Proving Grounds (YPG) in Yuma, AZ, on July 24. The 68-foot diameter parachute, attached to the 36,000-lb Jumbo Drop Test Vehicle (JDTV), was extracted from an Air Force C-17 aircraft at an altitude of 25,000 ft. After extraction from the aircraft, the JDTV was allowed to descend under a 12-ft diameter programmer parachute to an altitude of approximately 10,000 ft and a targeted dynamic pressure of 300 lb/ft² for initial deployment and inflation of the drogue test parachute. All onboard and range instrumentation and video data were recorded and are currently being processed. All test hardware was recovered from the drop zone and early indications are that all test objectives have been met.





Recent activities specific to the Elements include:

- **Flight and Integrated Test Office (FITO) and Ares I-X**
 - **Ares I-X Roll Control System (RoCS)Element:** Waiver drafts are being matured and the supporting presentations needed for the System Engineering Review Forum (SERF), Safety and Mission Assurance (S&MA), and Ares I-X Control Board (XCB) are being prepared. The helium subassembly and cable harnesses were installed on the cold flow unit. The Change Request (CR) is being updated to change the RoCS initiation from after T=0 to T=0 (primary command) and T+0.020 (secondary command), per the SERF. This CR needs XCB closure before proceeding with the pyro vibro-acoustics exceedances waiver to the XCB. Truncating of the six flight engine nozzles was completed. Installation transfer table Ground Support Equipment (GSE) piece parts are in fabrication. The Ares I-X Critical Design Review Part II (CDR II) was supported at the Langley Research Center (LaRC). The RoCS Pyrotechnics Phase III Review for Flight Hardware was supported at Ensign Bickford. A meeting at CDR II resulted in a proposal to eliminate cold flow unit fit check at Glenn Research Center (GRC) and using unloaded flight modules for the handling exercise and panelhole alignment verification before loaded-module installation. Kennedy Space Center (KSC) Ground Operations (GO) is reviewing the straw man schedule from RoCS.



Cold flow unit assembly status

- **IVGVT – Orion/Ares Bilateral Exchange Agreement:** On July 17th 2008, the Bilateral Exchange Agreement (BEA) between the Orion and Ares Projects was signed. This completed the last of the test element hardware agreements necessary for the IVGVT team to continue its forward momentum. This signed agreement reduced the IVGVT number 8 risk item from a 3x3 to 2x2, putting the risk in the green region.

- **Integrated Vehicle Ground Vibration Test (IVGVT) – Marshall Space Flight Center (MSFC) Test Stand 4550 Platform Removal Progress:** Test Stand 4550 platform removal is progressing well and is near the half-way point. Removal of Levels 6 through 9 platforms, used in Space Shuttle Dynamic Testing, has been completed. Removal of Level 5 is in progress.



Workers cutting a section of the platform prior to removal



A section of the platform being removed



Lowering of the crosswalk to facilitate platform removal

- **Ares V**
 - **Ares V Briefing at American Institute of Aeronautics and Astronautics (AIAA) Joint Propulsion Conference (JPC):** The Ares V Integration Manager briefed attendees at the AIAA JPC on the configuration and performance description of the Ares V. The briefing included a description of the current Point of Departure (POD) design vehicle 51.00.48 which includes six core stage RS-68B engines and two 5.5-segment steel case Solid Rocket Boosters (SRBs). The current POD came out of the Constellation-level Lunar Capability Concept Review (CCR) held in June, with the objective of meeting human lunar return requirements while maintaining margin.
- **Upper Stage (US)**
 - **US Manufacturing and Assembly (M&A) Subsystem:** Three Thermal Protection System (TPS) items for the Upper Stage are highlighted here. The first TPS item is cryo foam insulation development. Phase II testing of four foam insulation candidate materials is complete. These foams use the Hydrofluorocarbon-245a (HFC-245a) blowing agent to



address the obsolescence issue. A second goal is to develop a single foam system for acreage and closeouts. The second TPS item is green primer development. Phase II testing of seven primer candidate materials is complete. Six of these primer candidates are green primers not containing Hexavalent Chromium (Cr+6). The three candidates, in order of preferred ranking, going forward to Phase III testing are: PRC Desoto Ecoprime CF, Hentzen/05510WEP-X Epoxzen, and a low-Technology Readiness Level (TRL) candidate Insignia Zcoat. The third TPS item is ablator material development. Two environmental-friendly ablator materials were leading candidates from five tested in Phase II testing. They are Marshall Convergent Coating 1 (MCC-1) (SRB heritage) and P50 Cork (SRB heritage). They will potentially replace SLA-561 (External Tank heritage). The ablator material will be applied to system tunnel aft and forward fairings, Ullage Settling Motor fairing, and Liquid Hydrogen feedline fairing. These candidates progress to Phase III testing.

- **US Thrust Vector Control (TVC) Subsystem:** The TVC team made progress on three contracts:
 - ◆ Western Filter was awarded a contract to supply the engineering model hydraulic relief valve/filter manifold assemblies. Delivery is expected in 22 weeks.
 - ◆ Eaton was selected to supply the engineering model hydraulic circulation pumps. Contract was awarded on July 30.
 - ◆ Received all responses from a Request for Proposal to perform the excavation and pour the foundation for the two-axis test rig. Quotes have been evaluated and a selection was made on July 30.

- **Upper Stage Engine (USE)**

- **Powerpack Assembly 2 (PPA-2) Conceptual Design Review (CoDR):** On July 22, the J-2X PPA-2 CoDR was held at Pratt & Whitney Rocketdyne in California. The PPA-2 will expand on the test results from the PPA-1 test series, but will use flight-design J-2X turbomachinery, inlet ducts, and other components. PPA-2 tests are expected to begin at the Stennis Space Center (SSC) A-1 Test Stand in May 2010.



PPA-2 concept

- **Project Integration (PI)**

- **Ares Outreach:** The Ares Projects integration team presented the Ares story to five groups of students and teachers in the past week. On July 23, the team presented the Junior Ambassador Package to a group of 33 summer camp students attending Girls, Inc., and led them in a straw rocket activity. That same day, the team presented to a group of 8 co-op/interns with Jacobs ESTS working at Marshall Space Flight Center for the summer. On July 24, the team supported a presentation to 34 teachers attending Space Camp. The team also supported an



educational television program video shoot conducted by Middle Tennessee State University and the TeachSpace organization focusing on returning to the Moon. By providing teachers information and materials, they can take the exploration story to their classrooms, multiplying the impact of the Ares outreach effort.

- ***Ares Quarterly Progress Report #9:*** The Ares Projects integration team posted the Quarterly Progress Report #9 to NASA.gov and YouTube July 23–24. The link to the YouTube site is: <http://youtube.com/user/AresTV>.

The Ares Project looks forward to the Ares Upper Stage PDR Board on August 5.

...and as of this Ares Projects Weekly Summary, there are only 257 days until the first Ares I test flight, Ares I-X!!!