



Ares V Wind Tunnel Testing: Testing of the Ares V full stack has begun in the wind tunnel at Marshall Space Flight Center (MSFC). Testing has been completed using nominal mach numbers 2.75, 3.5, and 4.5. This is a force-and-moment type of testing to determine static stability and control of the stack.



Ares V being tested at mach 4.5

Recent activities specific to the Elements include:

- **First Stage (FS)**
 - **First Stage/Upper Stage Structural Interface Design:** Through technical discussions, First Stage (FS), Upper Stage (US), and Vehicle Integration (VI) designers/analysts have reached an agreement to go forward with the ATK proposed “2 bolt/pocket” interface flange design. Number of bolts, shear pin locations, etc., are still being assessed but have been determined to be workable. In the meantime, FS/US working meetings will continue until the Interface Control Document (ICD) Preliminary Interface Revision Notice (PIRN) is developed with a target date to be completed by December 1.
 - **Ares I-X Reefing Line Cutter (RLC) Qualification Tests:** The Ares I-X RLC Qualification Tests commenced on October 3 at Wyle Laboratories in Huntsville, AL. The first test performed was the 8-foot Handling Safety Drop Test. Post-test visual inspection revealed that one RLC unit had approximately 1/8-inch movement of the cutter blade. Non-Destructive Evaluation (x-ray) indicated that all four units drop-tested in the x-axis displayed failures of the shear pins holding the cutter blade. A problem report has been initiated with a three-part plan as follows:

- NDE of the delivered flight units at Kennedy Space Center (KSC) to confirm flight configuration has been maintained. (This part of the plan has already been accomplished; all units have been confirmed to be in flight configuration.)
 - Remove the four failed qualification units and ship to Roberts Cutters for functional tests using flight configuration parachute material and replace these four qualification units with spare units.
 - Develop additional KSC ground/integration procedural steps to help ensure the flight units will not be subjected to drop along the x-axis. The pyro team is also exploring the option to x-ray the RLCs after integration with the parachutes to confirm final configuration.
- **Deceleration Subsystem (DSS) Drop Test Technical Interchange Meeting (TIM):** The DSS team conducted a parachute drop test TIM this week at KSC. Key discussion items were the review of the first drogue test results and application of these results to the next drogue test, evaluation of refurbishment options for the Jumbo Drop Test Vehicle (JDTV), review of the plans to update the separation simulation model for the JDTV, and generate a forward plan for the main cluster test hardcover analysis. In addition, critical path activities associated with delivery of the Ares I-X main parachutes and altitude switch assembly were evaluated and a status was provided.
- **Flight and Integrated Test Office (FITO) and Ares I-X**

- **Ares I-X Roll Control System (RoCS) Element:** Activities specific to the RoCS Element include:

- All flight tank vent valve safety caps (4) have been welded, awaiting NDE. This same process will be used at KSC after propellant filling of the RoCS tanks.
- A noise problem on the Data Acquisition System for the orifice calibration test has been fixed, and testing is imminent.
- The flight panels were received after repeating of chemical film to take care of transportation and handling blemishes from match drilling, and threaded inserts are being installed in preparation for helium tank bracket installation.
- The test rig for performing flight helium system regulator and relief valve functional checks is undergoing component calibration checks.



Welded safety caps on tank vent valves



- The cold flow test procedure is in signature cycle.
- The RoCS Element Requirements Document (version 2.02) was approved outside of the Board.
- The RoCS hardware Pre-Ship Review Plan is in work. Hardware shipment may slip a couple of weeks beyond November 3 because of a fixed window for vibration testing at Wyle, which was originally going to be deferred until after shipment, but is now consuming Teledyne resources.
- The match-drilled flight panels have been given interim release (at risk) in order to continue processing. Helium tank brackets and structural brackets have been installed on these panels.
- RoCS received initial propellant and helium loading Work Authorization Documents (WADs) from KSC. These documents are in review within the team.
- RoCS Critical Design Review (CDR) Review Item Discrepancy (RID) closure continues, with 14 of 347 remaining open.
- The Hardware Pre-Ship Review Plan is in review. Hardware shipment is now planned for November 20.
- RoCS supported the interface panel/doubler bolt pull test at Langley, with the intent on gleaning allowable hole clearance dimensions and bolt torque values.
- A Material Review Board (MRB) was successfully held on sealing surface discrepancies on the bi-prop valve modified manifold blocks.
- A non-flight helium system regulator and relief valve underwent functional checks using the ullage simulator tanks and the pressure test rig, in preparation of functional testing of flight helium systems.



RoCS assembly line



Test rig for helium relief valve and regulator functional tests

- ***Integrated Vehicle Ground Vibration Test (IVGVT) – Procurement of the Hydrodynamic Support (HDS) Hydraulic Power Unit is underway:*** The HDS units provide a floating support for the Ares IVGVT article. The Hydraulic Power Unit provides power and hydraulic controls to the HDS during the testing of the Ares test article. Edgewater Automation was



given a purchase order on September 29, 2008 to fabricate and assemble an HDS Hydraulic Power Unit for a full functional test of an HDS unit scheduled for early 2009. Delivery of the unit is scheduled for February 2009.

- **Project Integration (PI)**

- **Ares Outreach:** The Ares Projects outreach team supported an Ares/Constellation presentation to teachers attending the Alabama Science Teachers Association Annual Conference at the McWane Center in Birmingham on October 1. An Ares communications strategist staffed the Exploration Systems Mission Directorate Trailer for its visit to Jefferson Community School, Minneapolis, MN, on October 5–8. On October 8, the team presented the exploration/Ares story to staffers from Educator Resource Centers in the Marshall Space Flight Center’s six-state region.
- **U.S. Space and Rocket Center Ares Exhibit:** The Ares Projects outreach team and the Marshall exhibits group met with personnel at the U.S. Space and Rocket Center on September 30 to discuss plans for an Ares exhibit for the Davidson Center. The new Davidson Center houses the museum’s Saturn V, and it will be a high-visibility venue for showcasing NASA future plans for space exploration.

The Ares Projects look forward to the Friction Stir Welding “confidence welds” on actual US dome gores in MSFC Building 4755 in late October; the J-2X CDR Pre-Board on October 29–30; and the J-2X CDR Board on November 13.

...and as of this Ares Projects Weekly Summary, there are only 180 days until the first Ares I test flight, Ares I-X!!!