



The Ares I Upper Stage (US) Flight Software (FSW) Preliminary Design Review (PDR) 2 (which began on March 23, 2010), was successfully completed through the FSW PDR Board on June 24, 2010. The Board was chaired by Jody Singer, Acting Deputy Manager for the Ares Projects Office. This review focused on the requirements and the preliminary design of the Flight Computer (FC) software as well as the Command & Telemetry Computer (CTC) requirements, and established the basis for proceeding with detailed design and coding. The FSW PDR was a follow-on to the CTC PDR, which was held in March 2009 and focused on the requirements and design of the CTC software. The FSW PDR participants included personnel from Marshall Space Flight Center (MSFC), Glenn Research Center (GRC), NASA Headquarters (HQ), Jet Propulsion Lab (JPL), Johnson Space Center (JSC), and Kennedy Space Center (KSC). The US FSW Critical Design Review (CDR) will be held in conjunction with the US CDR in June 2011.

### First Stage (FS)

**Avionics System Level Development Testing:** The First Stage Element is currently conducting Avionics system-level development testing at ATK's Clearfield M-11 facility. The testing exercises the flight design functionality through all flight phases and verifies fault tolerance utilizing a newly designed electrical ground test set. As part of the total risk reduction effort, a test was developed demonstrating avionics system functionality during a nominal mission scenario. Members of the Ares Project management team visited the M-11 facility and witnessed the demonstration and took a tour of the M-11 test control room and the major assembly integration mockups. The mockups are being used to integrate and design multiple systems into the major structures concurrently with 3-D modeling activities. This physical verification activity is streamlining the design process and reducing risk early in the design program. Avionics development testing at M-11 will continue through calendar year 2010.



*Avionics mockup system.*



### Flight and Integrated Test Office (FITO)

**Hydrodynamic Support (HDS) – Building 4619:** Work continues on the HDS units in Building 4619. Recently, the team completed piston leak testing for the third of four HDS units. Shown below is the insertion of the piston into the cylinder during the assembly process. Due to improved sealing techniques developed by the HDS Team, the leak testing of the second and third units has shown significant improvements.



*Insertion of HDS piston into cylinder.*

### Upper Stage (US)

#### *Structures and Thermal (S&T) Subsystem:*

Thompson Aluminum Casting Co. of Cleveland, Ohio has received tooling and produced the first Upper Stage Structures and Thermal (S&T) thrust cone engine gimbal mount development casting. This first article is for vendor internal properties and dimensional validation of the casting process. Subsequent castings will be used for material properties and development testing. The thrust cone is the structural interface between the core stage and the J-2X Engine



*Thrust cone engine gimbal mount.*

### Project Integration (PI)

*Take Your Kids to Work Day:* The Ares Projects outreach team coordinated and staffed the Interactive Constellation Experience at Marshall Center's Take Your Kids to Work Day on June 10. More than 500 people viewed the exhibit. Children were able to experience NASA's exploration plans with their parents.

***The Ares Projects look forward to the test firing of DM-2 and the launch of STS-133, Space Shuttle Discovery, in September.***