



**Upper Stage Engine (USE) Workhorse Gas Generator (WHGG):** The J-2X Combustion Devices team successfully completed certification-time testing of a thermal emissivity coating for the engine nozzle extension. In tests in the Marshall Space Flight Center (MSFC) Hot Gas Facility, a coated panel section of the extension accumulated 3,450 seconds and 14 starts with no signs of damage to the coating. The team also activated the helium spin start system at Test Stand 116, which will be used in the next phase of WHGG testing. This simulator will be used to provide the proper inert back-pressure on the WHGG igniter to simulate the environment that the flight GG will experience during start. PCC Structurals, Inc., Portland, OR, poured the castings for flight-design gas generator manifolds that will be used on J-2X development engines 2 and 3. Tooling and manufacturing work continued on the Interpropellant Plate, LOX domes, and Augmented Spark Igniter.



*J-2X metallic nozzle extension panel with emissivity coating after 1,776 seconds of test time. The circular patch near the leading edge is post-test repair. The circular patch toward the trailing edge is an in-process repair. Both showed excellent durability.*

### Upper Stage (US)

**US Logistics Subsystem:** The Ares “High Schools United with NASA to Create Hardware” (HUNCH) Implementation Team has been selected to receive a NASA Group Achievement Honor Award. During the academic year 2008–09, students at 10 high schools and engineering academies



partnered with Marshall engineers and education specialists to analyze current plans, model hardware, and fabricate prototypes for elements of the Ares I upper stage and the J-2X engine. The prototypes were used for functional “fit checks” to determine how the designs function when translated from two- and three-dimensional computer models to full-scale hardware mock-ups. The student teams participated in NASA’s HUNCH project. Now in its sixth year, the project is designed to boost students’ interest in pursuing careers in technology and engineering through hands-on engagement in NASA projects and interaction with NASA engineers.

The Ares HUNCH Team allowed successful transition from Shuttle hardware to Constellation hardware by identifying Ares and J-2X engine plans that the student teams could model and fabricate. Ares personnel maintained contact with each school throughout the academic year to ensure their success, then participated in a recognition ceremony/NASA acceptance review of the student-built hardware. This team is receiving the NASA Group Achievement Honor Award for support of this NASA education project and for providing extra assistance to enable the student teams to generate hardware for Ares that has been incorporated into upper stage mock-ups at the Performance Analysis and Design Demonstrator (PADD) facility in Marshall Building 4205.

### **Project Integration**

**Ares Outreach:** The Ares Projects outreach team wrote/coauthored two Ares-related articles recently. NASA’s ASK Magazine’s Winter 2010 issue contains an article co-authored by an Ares technical writer about interaction between the Ares V design team and the science payload community. ASK has a hard copy circulation of approximately 5,500, primarily NASA management. The online article is available at: [http://askmagazine.nasa.gov/issues/37/37s\\_rocket\\_science\\_dialogue.php](http://askmagazine.nasa.gov/issues/37/37s_rocket_science_dialogue.php). The February 2010 issue of Spigot Science Magazine contains an article authored by an Ares Historian, describing for middle school students how NASA designs rockets. Design was the theme of the issue. The online publication has 100,000 subscribers, primarily teachers, students, and parents. The article is available at: <http://spigotsciencemag.com/site/>.

***The Ares Projects look forward to the launch of STS-131, Space Shuttle Discovery, planned for April 5.***