



***First Stage (FS) Preliminary Design Review (PDR):*** The FS PDR Pre-Board is being held this week, on Wednesday, May 21, 2008, at the ATK Facility in Research Park, Huntsville, Alabama. The FS PDR Board is scheduled for June 5, 2008.

*Recent activities specific to the Elements include:*

- **Flight and Integrated Test Office (FITO) and Ares I-X**
  - **Ares I-X Avionics Integrated Product Team (IPT) First Stage Avionics Module (FSAM) Critical Design Review (CDR):** The Avionics Integrated Services (AIS) contractor presented the completed FSAM design that meets all requirements. The structural, stress, and thermal analyses all showed positive margin. None of the Requests for Actions (RFAs) that were written prevent the FSAM manufacturing from being completed or change the FSAM design. Forward work includes completing the Ground Support Equipment (GSE) and transportation designs and integration operations with the First Stage contractor. The CDR board, comprised of representatives from all Ares I-X IPTs and the Mission Management Office (MMO), will be held May 23, 2008.



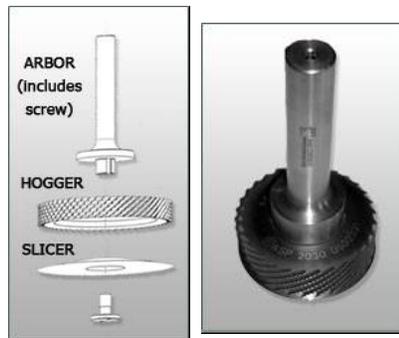
*CAD model of the Lockheed Martin-provided FSAM including hardware placement and Environmental Control System (ECS) ducting; the FSAM will be located in the XL segment of the Ares I-X FS*

- **Integrated Vehicle Ground Vibration Test (IVGVT) – 30% Review Document Table Tops:** The IVGVT team completed the table top reviews of documentation. The 30% Review is being held to ensure the test is on plan to support the Ares I Preliminary Design Review (PDR) and that the IVGVT Test Plan is ready for submittal to the Ares I PDR document review process as a Review Item Discrepancy eligible (RID-able) document. Documents reviewed were the seven IVGVT Interface Control Documents (ICDs), IVGVT Safety, Reliability, and Quality Assurance (SR&QA) Plan, IVGVT Top Risk, IVGVT Transportation Plan, IVGVT Task Plan, IVGVT Test Implementation Plan, and the IVGVT Test Plan. The comments provided by document reviewers were reviewed and dispositioned. The documents will be presented to the FITO Engineering Review Board (ERB). Ultimately, the documentation will be approved for submittal to the Ares Preliminary Design Review (PDR)

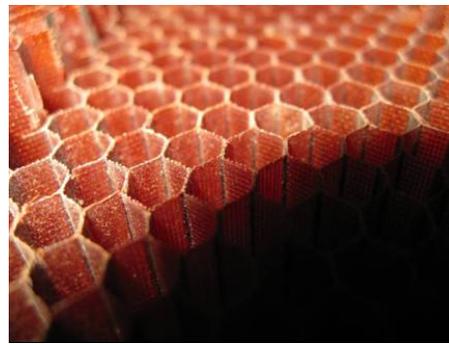
at the FITO Engineering Change Board (ECB) on June 5th, in support of the June 13 data submittal supporting the Ares I PDR.

- **Upper Stage (US)**

- **US Manufacturing and Assembly (M&A) Subsystem:** A Core Hog cutter tool manufactured from AMS for fine machining honeycomb was recently evaluated at MSFC. Machining studies were conducted using an MSFC-owned 5-axis Cincinnati (VC-120) milling machine in Building 4705. The cutter, made of carbide, was run in this evaluation at 5,000 revolutions per minute, with a feed rate of 50 inches per minute. The results showed very little fuzz on the core and a fairly clean cut. Studies of tool failure and tool life are ongoing. Approximately 300 square feet of honeycomb core will need machining on the US Common Bulkhead.



*Core Hog Cutter Tool*



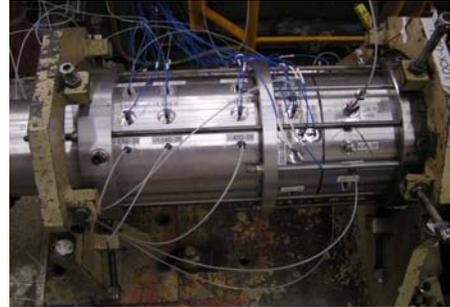
*Honeycomb core after machining*

- **US Thrust Vector Control (TVC) Subsystem:** The US TVC Subsystem selected Advance Manufacturing Corporation to fabricate the 2-axis test rig base frame and cone weldment assembly, and to provide integration supports and steel materials for the nozzle mass assembly fabrication at NASA Glenn Research Center (GRC). The 2-axis test rig simulating US engine gimbal dynamics will be used to test the engineering model TVC subsystem. Completion of the 2-axis test rig fabrication and assembly is planned by November 2008.
- **US – Stage Operations (SO):** The Main Propulsion Test Article (MPTA) team hosted a Hardware–Software Integration Technical Interchange Meeting (TIM) on May 12–14, 2008. The main purpose of the TIM was to gather information in support of a Main Propulsion Test (MPT) Systems Definition Review (SDR) planned for mid to late August. The discussions began with requirements as they are flowed to MPT and presentations were made by all subsystems represented on the MPTA, including the Upper Stage Engine. The preliminary MPT operational concept was presented and discussed. Extensive discussions regarding interfaces, instrumentation, test objectives, hardware configuration, configuration management, and drawing/data packages, as well as software configuration, capabilities, and support for MPTA, generated many comments and questions. The meeting provided an excellent forum for free exchange of information between disciplines, subsystems, elements, and support organizations. The three-day session was very productive and will provide a good foundation for two additional TIMs that are planned for this summer (2008).



- **Upper Stage Engine (USE)**

- **J-2X Oxygen Turbopump (OTP) Subscale Inducer Testing:** The J-2X OTP subscale inducer testing at Pratt Whitney Rocketdyne (PWR) has been completed. Four separate test series were run on the three-bladed inducer design to determine its performance at flow rates ranging from 110% nominal to 10% nominal flow rate conditions. The tests included basic performance mapping (pressure rise vs. flow rate), and suction performance mapping (cavitation limits) for not only the planned steady state engine operation, but also the start and shutdown transient conditions. The data is being assessed against the recently tested two-bladed design and the heritage inducer design. In addition to these performance criteria, the designs are being assessed on the amount of backflow sent into the engine inlet ducts, the level of alternating pressure fluctuations imparting loads into other turbopump components, and the level of pressure fluctuations being sent into the Main Propulsion System. The inducer selection is still planned for the end of May.



*OTP test rig with 3-piece tunnel assembly*

- **First Stage (FS)**

- **Ares I-X Reefing Line Cutters Test Readiness Review (TRR):** A TRR was conducted at Wyle Laboratories in Huntsville on Friday, May 16<sup>th</sup>. This TRR was held to discuss the status of the test hardware and test planning documentation for the Ares I-X Reefing Line Cutter Qualification Test program. Additional planning was also discussed regarding the installation of 90-degree pull sleeves to the off-the-shelf Roberts Reefing Line Cutters. The sleeves will be installed on all of the cutters (both qualification and flight units) at Wyle. The installation is planned to be performed by USA (Huntsville) Material and Processes (M&P) personnel and they are currently coordinating the installation procedure with USA (Florida) M&P personnel. Once they are complete, the procedure will be sent to MSFC for coordination with MSFC M&P personnel. The test plan and test procedure also require additional maturation before the tests can be conducted. Based upon the completion of all this activity, the qualification testing should begin in about 3 weeks. The installation of the cutters at Kennedy Space Center (KSC) into the main parachute packs is scheduled for June 21, 2008.

- **Project Integration (PI)**

- **Ares Quarterly Progress Report (QPR) Video #8:** The Ares Project Integration team released QPR Video #8 on the NASA web site (<http://www.nasa.gov/topics/moonmars/index.html>) and the Ares YouTube web site (<http://youtube.com/user/AresTV>).

- **Team America Rocketry Challenge:** The Ares Project Integration team supported the Team America Rocketry Challenge (TARC) held May 16–17 in The Plains, Virginia. A Project Integration representative spoke to the 600 middle school and high school students participating in the Challenge. These students were members of the top 100 teams from across the nation invited to this event. The integration team also displayed the 1:15 mobile Ares I and 1:100 Ares model set, and launched an Ares I 1:50 model rocket. TARC is the world’s largest rocket contest, sponsored by the Aerospace Industries Association and the National Association of Rocketry. Approximately 800 people attending the event visited the NASA exhibit.



*MSFC 1:50 Ares I Model*

- **Ares School Outreach Visits Schools:** The Ares Project Integration team presented an Ares overview to 110 students in fourth and fifth grade at Montview Elementary School in Huntsville on May 8. The students had the opportunity to see how far they could launch a straw rocket. The team also participated in Horizon Elementary School’s Space Week on May 9. There were 240 students in second through sixth grades who participated in a straw rocket activity and learned about the force that propels straw rockets or Ares rockets. Brookhill Elementary School in Athens hosted an Ares engineer on May 2 to talk to 60 first graders about our future in space. The integration team provided Ares I and V models to support the presentation.



*An Ares integration team member provides “ground support” to Horizon students (left), and an all-girl team (right) poses around their launch pad after a successful “mission.”*

The Ares Project looks forward to the STS–124 Shuttle Discovery launch set for May 31.

***...and as of this Ares Project Weekly Summary, there are only 327 days until the first Ares I test flight, Ares I-X!!!***