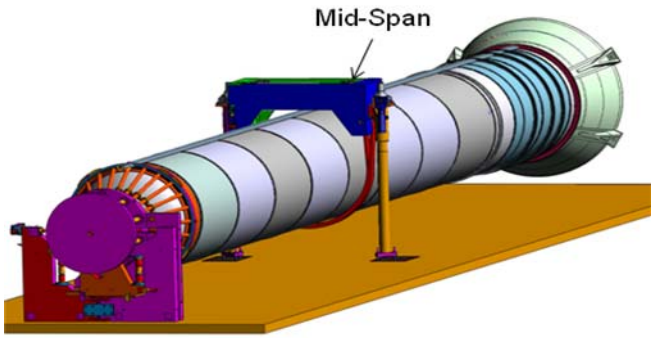
First Stage (FS) Development Motor (DM-1) Static Test: Representatives from the First Stage Element Office, Engineering, Safety and Mission Assurance (S&MA), and Systems Engineering and Integration (SE&I) participated in the Ares T-97 Test Services Readiness Review Technical Interchange Meeting (TIM) on April 1–2 at ATK. The T-97 Test Stand is being upgraded to prepare for the first Ares I five segment Solid Rocket Motor (SRM) test planned in August 2009. Modifications include upgraded forward and aft test stands, a new mid-span support, new fire control system, and new data acquisition systems. This meeting resulted in approval for ATK to proceed with receiving and assembly of the Ares DM-1 motor.



New T-97 Mid-Span Support

Recent activities specific to the Elements include:

First Stage (FS)

- ***Ares I-X Postflight Assessment*:** A face-to-face meeting was held at the ATK Kennedy Space Center (KSC) facilities with representatives from United Space Alliance (USA)/Ground Operations, ATK, Range Safety, Langley Research Center (LaRC), and Marshall Space Flight Center (MSFC) to discuss the Ares I-X Post-flight Assessment. ATK provided an overview of the delta configurations that have occurred since the last meeting. The process flow for post-flight assessment was reviewed to evaluate where start and stop points are due to postflight activities being interrupted when Shuttle launches occur. Contingency plans and team composition were also discussed. A kick-off for the Post-flight Assessment Plan Review has been scheduled for April 6 at the ATK Lakeside facilities in Huntsville, AL.

Upper Stage (US)

- ***US Avionics and Software:*** US team members from MSFC, including Upper Stage Element Office, Chief Engineer, and Engineering personnel, attended the US Flight Computer/Command Telemetry Computer (FC/CTC) Post-Award TIM with Ball Aerospace in Boulder, CO, on April 6–7. Ball Aerospace was recently selected by Boeing as the vendor for the Ares I US FCs and CTCs. The purpose of the TIM was to reach a clear understanding of the requirements that are delineated in the specifications for both computers. The specifications were authored by the NASA Design Team. Specific areas of discussion included the top technical risks identified by Ball in the development of the computers, hardware/software interface issues, and design options for mitigating vibration, shock, and thermal environments. Boeing, the US Instrument Unit Avionics contractor, led the meeting and the objectives of the TIM were met.

- ***US Integrated Test Subsystem:*** The US Verification and Test Teams recently conducted a week-long TIM to review all US Design Verification Objectives (DVOs) that have test as a verification method. The first 3 days of the TIM were dedicated to Element Requirements Document (ERD)-level 3.7 requirements that have been levied against the US subsystems. The last day of the TIM was directed towards ERD 3.2 system-level requirements. Primary items of interest included discussions related to using flight tests for verification, specifically those tests that occur past Design Certification Review (DCR). There are several US requirements that cannot be verified by ground testing alone, such as ullage collapse, pogo suppression, guidance navigation and control performance, and separation performance.

  Another major finding of the TIM was the perceived lack of interface testing between the subsystems and avionics. The Systems Integration Test Facility (SITF) is being developed specifically to test the avionics system and the subsystems, up to the interface. No subsystem hardware exists in the SITF, so there is no overlap that can verify the interface is being interpreted similarly on both sides of the interface. The US Avionics Team is currently evaluating the total scope of hardware that should be added to adequately test the interfaces.

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:

  - The RoCS Team completed support to the successful fuel and oxidizer loading in Module A. Both modules are now loaded with propellants.
  - The fairing modification kit was shipped to KSC. KSC procedures were reviewed and approved, allowing proceeding with the modification implementation. This modification strengthens the fairings based on a new aero loads case that came out in December 2008. The Teledyne break-out-box to perform the post-fairing modification Development Flight Instrumentation (DFI) check-out was shipped to KSC.
  - The waiver request AIX-0170 for no Peacekeeper propellant tank vibration testing was submitted to the System Engineering/Ares I-X Control Board (XCB) for formal review.

Pressurization system assembly is next up for vibration testing. The vendor test fixture had some clearance problems, but Teledyne is resolving this issue. MSFC Engineering is reviewing data from bi-prop valve vibration testing.

- XCB approval was received for changes to RoCS Assembly Drawing, which included fairing interface modifications and deletion of the RoCS-to-Interstage bonding strap. A change request was submitted to the Technical Review Board for an update to the RoCS Installation Drawing, incorporating Lessons Learned from February fit checks in the Interstage.

The Ares Projects looks forward to the FS Cluster Drop Test in May.

…and as of this Ares Projects Weekly Summary, there are only 141 days until the first Ares I test flight, Ares I-X!!!