



Ares I-X Milestone Review: Launch Minus 1 Year: Ares I-X reached its milestone of 1 year until launch. To commemorate the milestone, the Ares I-X management team conducted a 4-hour status briefing to the Agency leadership at Stennis Space Center (SSC) on April 14. The attendees included representatives from NASA Headquarters (HQ), the Exploration Systems Mission Directorate (ESMD), the Constellation Program (CxP), Center Directors, the Office of Safety and Mission Assurance (OSMA), and Shuttle. Ares I-X presenters conveyed accomplishments and forward work. The response from the Agency-wide audience was very positive regarding the Ares I-X team's accomplishments and the plans leading to launch. Dr. Mike Griffin spoke about the importance of the Ares I-X flight test and the technical benefits that Ares I-X will provide to Ares. He stressed the importance of working across NASA Centers and reinventing our processes.

Ares I-X



First Stage



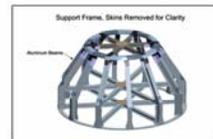
Upper Stage Simulator (USS)



Avionics



Roll Control System (RoCS)



Command Module/ Launch Abort System (CM/LAS)



Upper Stage Engine (USE)

Powerpack Assembly 1A (PPA-1A)

Test #7: Test 7 on Powerpack 1A was successfully conducted at the SSC Test Facility A-1 on April 14. The primary test objective was to obtain J-2 heritage Liquid Oxygen (LOX) pump suction performance data needed to inform the J-2X LOX pump design. The planned test duration was no longer than 350 seconds and was terminated at 240 seconds due to expected pump cavitation associated with the test objective. Preliminary data indicate all objectives were met.



PPA-1A on the stand at SSC



Recent activities specific to the Elements include:

- **Flight and Integration Test Office (FITO)**
 - **Ares I-X Roll Control System (RoCS) Element:** Resolution has been reached on the loads and fastener sizes at the interface between RoCS and Upper Stage/Interstage. The change to fasteners is moving out ahead of the processing of the Change Request of the Interface Requirements Document to preserve schedule. The generation of Verification Requirements Definition Sheets has started and the RoCS-specific Verification Requirements Document is in RoCS internal review. The RoCS Installation Drawing was released per the required Integrated Master Schedule for inclusion in the planning of the Operational Test Requirements at Kennedy Space Center (KSC). The RoCS team participated in the kick-off of the KSC RoCS-to-Interstage installation procedure development.

- **Upper Stage (US)**
 - **US Integrated Test Subsystem:** A decision has been made to hold a Technical Interchange Meeting (TIM) between NASA/Marshall Space Flight Center (MSFC) and the NASA/Glenn Research Center (GRC) to review plans and shared responsibilities for the design, analysis, and fabrication of the Special Test Equipment (STE) and structural test simulators that will be needed for the Ares I US Structural and Thermal test program. The TIM will be held at MSFC May 6–7. GRC and MSFC are working together as a team to help meet many of the requirements of the US test program. This TIM will help establish a common understanding of test requirements and implementation details, including load frame design, analysis, fabrication, delivery, and installation. The meeting will also help ensure mutual agreement on drawing and computer model sharing, and will clarify the division of responsibilities between GRC and MSFC for STE and simulator analysis and fabrication. This teaming arrangement with GRC is allowing the US Element to benefit from the capabilities of the GRC team currently building the US flight test simulator for the Ares I-X mission.
 - **US Thrust Vector Control (TVC) Subsystem Preliminary Design Review (PDR):** The TVC PDR came to a successful conclusion with the convening of the Pre-Board and Board on April 4 and 11, respectively. The PDR process resulted in 318 accepted Review Item Discrepancies (RIDs) and 193 Comments. Both the Pre-Board and Board recommended that TVC proceed to Critical Design Review (CDR) with completion of Requests for Actions (RFAs).
 - **US TVC Subsystem Breadboard Testing:** The TVC Breadboard testing moved into the last phase by attaching the Turbine Pump Assembly (TPA) to the hydraulic system. This TPA was a Delta IV heritage design with a modification to add a lube pump to extend the operation life from 2,400 seconds to 7,500 seconds. As of April 10, the TPA has accumulated 7,540 seconds of run time. Testing will continue during the week of April 14, until the TPA fails to meet its performance requirements.

- **Upper Stage Engine (USE)**

- **A-3 Chemical Steam Generator (CSG) Activity:** SSC Test Position E-2 is being prepared to test an A-3 CSG "can." Up to 27 cans will be operated at the same time to produce steam for the A-3 diffuser.



*Test platform and exhaust manifold at
SSC Test Position E-2*

- **A-3 Subscale Diffuser (SD) Activity:** An SD first-stage ejector manifold is being fabricated to support ejector performance demonstration testing at SSC Test Position E-3.



*Electro-discharge Machining (EDM) of
SD first stage ejector*

- **First Stage (FS)**
 - **Full-Scale Ground Tests for Ares I-X Separation Rings:** Ares FS and ATK will conduct full-scale separation tests of both separation rings for Ares I-X early this summer. A Development/Engineering test for the Recovery Separation Ring (Forward Skirt Extension/Forward Skirt Interface) is scheduled to be conducted on May 29–30. This test series, using non-flight hardware, will be used to verify installation procedures, fit check, test procedures, and data acquisition hardware functionality. Flight hardware tests will begin on June 16. These tests will be performed with flight ordnance and structures/rings for both the Recovery Separation Ring and the Primary Separation Ring. (For Ares I-X, this interface is near the bottom of the frustum.) Primary test objectives for these tests include: full-scale form/fit/function of flight hardware with KSC/Ground Operations insight, characterization of ordnance (severance and timing), characterization of separation body dynamics, measurement of induced shock environments, and debris characterization. A Test Configuration Review will be held at ATK in Promontory, UT, on May 8.



Forward Skirt Extension Simulator (outer diameter being machined still requires bolt holes)



Tooling separation ring (complete, less the inspection/buy-off)



Frustum weight (8,000-lb top half is tapered to attach to frustum)



Bottom half of frustum weight



- ***Deceleration Subsystem (DSS) Air Force Flight Test Center (AFFTC):*** The DSS drogue and remaining main parachute drop tests will be conducted by the AFFTC from Edwards Air Force Base. All of these tests will be air drops in excess of 42,000 lb, which is the limit for operational air drops. Therefore, these tests are classified as development air drops which must be conducted by the AFFTC. The DSS project, along with the Orion project, participated in a test coordination meeting last week with the 418th Test Squadron Wing Commander at the AFFTC.
- **Project Integration (PI)**
 - ***National Space Symposium:*** The Ares Projects integration team supported this major national conference on April 7–10 in Colorado Springs, CO. Approximately 7,000 people attended the symposium. Approximately 1,900 people, including 400 students, visited the NASA exhibit. Visitors included Colorado’s Lt. Governor Barbara O’Brien, MSFC Director Dave King, MSFC Deputy Director Robert Lightfoot, former Shuttle Program Manager Wayne Hale, and ESMD Deputy Associate Administrator Doug Cooke. Exploration-focused displays included the 1:25 Ares I cutaway, the Interactive Constellation Experience, and the 1:100 Ares I and V model set.



ESMD Outreach Coordinator quizzes students about NASA’s exploration plans, with the Interactive Constellation Experience in the background.

The Ares Project looks forward to the J-2X PPA-1A Test #8, which is currently scheduled for April 23.

...and as of this Ares Project Weekly Summary, there are only 362 days until the first Ares I test flight, Ares I-X!!!