



Upper Stage Preliminary Design Review (PDR): The Ares I Upper Stage (US) Element Office conducted its PDR Kickoff June 3–6 at the Boeing Conference Center in Huntsville, AL. In addition to discussions of PDR objectives, processes, and tools, Kickoff participants also received an Element overview from US Manager Danny Davis and detailed subsystem overviews from the US Integrated Product Leads. Marshall Space Flight Center (MSFC) tours of the US Virtual Design Room, Performance, Analysis, and Design Demonstrator (PADD) Mock-ups, and the new Robotic Weld Tool were also conducted for Kickoff participants. The US PDR will conclude with the Pre-Board and Board meetings on July 25 and August 5, respectively.

Recent activities specific to the Elements include:

- **Upper Stage (US)**
 - ***US Manufacturing & Assembly Subsystem:*** A full-scale, spun-formed dome qualification article has been manufactured for the Ares I US Element at the Spincraft Company in Boston, MA. Specimens from the “un-machined” aluminum-lithium 2014 article are being tested from various locations, including the apex. Once the properties meet requirements, the dome will be cut in half and shipped to Marshall Space Flight Center (MSFC), allowing for further testing and shipping cost savings.



2014 Qualification Article from Spincraft

- **Flight and Integrated Test Office (FITO) and Ares I-X**
 - ***Ares I-X Roll Control System (RoCS) Element:*** Ares I-X has successfully worked the delegated Quality Assurance personnel unavailability issue with Procurement and Safety and Mission Assurance (S&MA). Changing of personnel had held up Ground Support Equipment



(GSE) proof loading. They also supported the S&MA and Engineering Management Council (EMC) review of Ares I-X/RoCS issues with MSFC S&MA and Engineering Directors. They continued the coordination with the vibration vendor with transmittal of Pro-E models of the engine bi-prop valve and helium system, and test request development. Preparations continue for the Ares I-X Critical Design Review Part II (CDR II) and x-sync data drops. Material Review Board (MRB) #2 was held to disposition some GSE interface block discrepancies. The RoCS team supported a virtual Technical Interchange Meeting on the Interstage Segment #1 (IS-1) interface bolts; final agreement was reached to match drill the RoCS panel to the interstage doubler, with the hole diameter still being finalized by Glenn Research Center (GRC).

- **First Stage (FS)**

- **Deceleration Subsystem (DSS) Ares I-X Main Parachute Fabrication:** Pioneer Aerospace Corporation has the subcontract from United Space Alliance (USA) to fabricate the 150-foot diameter Ares I-X main parachutes. Pioneer has completed fabrication of the first main parachute at their Columbia, MS plant and it was shipped last week to USA. Although Pioneer is currently working on fabricating the second parachute and cutting materials for the third, Ares I-X will use two unused test main parachutes previously fabricated by USA at the Parachute Refurbishment Facility to complete the build for Ares I-X. Therefore, all three main parachutes are on hand at Kennedy Space Center (KSC) and USA will commence with the rigging and packing processes to support an August delivery to the Assembly and Refurbishment Facility (ARF). As the final two parachutes are delivered by Pioneer, they will go back into the test program.

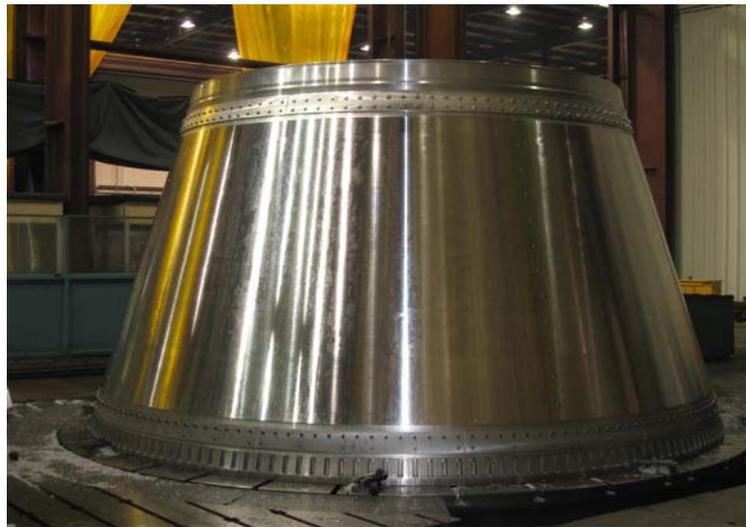


Complete parachute in Pioneer's Mississippi facility

- **DSS Ares I-X Main Parachute Reefing Percentages:** The analysis to determine the optimum inflation reefing percentages of full open for the Ares I-X main parachutes was completed last week. Inputs into the analysis included booster sequenced mass properties, drogue parachute inflation curves optimized to minimize the drogue peak load, and the main parachute inflation curves that produce balanced peak loads based upon the opening load factors determined from the single main drop tests. The analysis results indicate the need for making a small increase to the reefing percentages as presented at the Ares I-X Major Design Review (MDR). The first stage will increase from 19% to 21%, and the second stage will increase from 38.5% to 40%. Reefing lines to provide these new reefing percentages will be fabricated and installed into the Ares I-X main parachutes prior to packing and delivery.



- **Ares I-X Site Visit to Major Tool:** A site visit was made to Major Tool in Indianapolis, IN, with representatives from Ares I-X, ATK, and Johnson Space Center (JSC). Topics discussed included:
 - Manufacturing schedule status and likelihood of meeting the projected dates.
 - Developmental Flight Instrumentation (DFI) processing options in order to reduce schedule.
 - Potential arrangements with the Guppy for shipping large structures to KSC.
 - Manufacturing/assembly/integration assessments for pocketed joints and how that data can be used as a pathfinder for Ares I.



Ares I-X frustum currently undergoing final machining at Major Tool in Indiana

- **Project Integration (PI)**
 - **Great Teacher Conference:** The Ares Projects integration team supported this June 2–4 event at Columbia High School in Huntsville, AL. Approximately 350 Huntsville/Madison/Madison County teachers of grades K–12 attended this event, sponsored by The Schools Foundation, with approximately 300 visiting the NASA booth. An Ares presentation was given to the teachers attending the conference, aimed at giving teachers new Ares-related ideas for their classrooms to help inspire and motivate students.

The Ares Project looks forward to the many Element Preliminary Design Review (PDR) and Critical Design Review (CDR) Kickoffs, Boards, and Readiness Reviews in June and July.

...and as of this Ares Projects Weekly Summary, there are only 306 days until the first Ares I test flight, Ares I-X!!!