



Fig. 1: A-3 Construction Site



Upper Stage Engine (USE) Test Stand A-3 Construction Update: Construction continues on Test Stand A-3. A view of the construction site from the top of Test Stand A-2 is shown in Figure 1. Tower erection is nearing completion. The tower structure has a height of approximately 225 feet and is shown in Figure 2. The liquid hydrogen propellant tank will extend the stand height to approximately 320 feet when completed. Steel workers are shown connecting tower sections in Figure 3. The propellant docks are also nearing completion. The liquid oxygen barge dock is shown in Figure 4.



Fig. 2: A-3 Tower



Fig. 3: Steel Workers at A-3



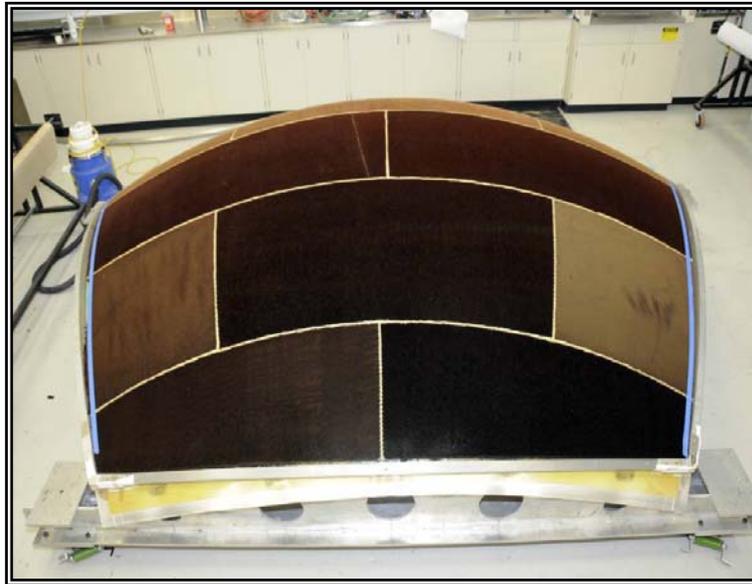
Fig. 4: Liquid Oxygen Barge Dock

Recent activities specific to the Elements include:

Upper Stage (US)

- **Upper Stage (US) Manufacturing and Assembly (M&A):** The first common bulkhead bond of honeycomb-to-External Tank (ET) gore pair was recently successfully performed in Marshall Space Flight Center's (MSFC's) Building 4707. The photograph below shows the honeycomb sections that were bonded, with core-splice adhesive (white) in between the sections. The different shades are a result of different heat lots and honeycomb density. The honeycomb will subsequently be machined at Michoud Assembly Facility (MAF) for a second bond at MSFC.

Following these two sub-scale bonding demonstrations, manufacturing of the common Bulkhead Manufacturing Demonstration Article (MDA) is planned.



Bonded Honeycomb Sections with Core-Splice Adhesive (White) in Between



MSFC Technicians Working on a Common Bulkhead Seal Weld

- US M&A Initiates Common Bulkhead Seal Weld Process Development Activity at MSFC:*** The weld will be fusion welded into a joint between an Aluminum-Lithium (Al-Li) 2219 seal plate and 2219 ring forging. The image to the left shows a close-up of manual weld trials done on a subscale (3-foot) diameter ring. Two joint configurations will be investigated, including manual or automatic welding processes. The process needs to be characterized before the common bulkhead Manufacturing Demonstration Article (MDA) 2219 y-rings are machined.

Upper Stage Engine (USE)

- ***A-3 Risk Mitigation Testing:*** Chemical Steam Generator (CSG), risk mitigation testing is being performed at Test Facility E-2 at Stennis Space Center (SSC). The test article, a single CSG “can,” is installed and has successfully undergone flow tests. Ignition tests are scheduled for this week and full steam flow tests are scheduled for mid-April. CSG test data will establish system operations and resolve technical issues. Subscale diffuser testing is ongoing at Test Stand E-3. Current tests are to measure acoustics and assess noise suppression options. Future tests will be performed to support a redesign of the diffuser elbow.

Flight and Integrated Test Office (FITO) and Ares I-X

- ***Test Stand 4550 Special Test Equipment (STE):*** The Hydrodynamic Support (HDS) System’s hydraulic power unit has been assembled and powered-up at the vendor, Edgewater Automation. The hydraulic power unit consists of the accumulator unit, the charge pump skid, and the high-pressure pump skid. This skid-mounted hydraulic power system will be used at Test Stand 4550 for the Ares Integrated Vehicle Ground Vibration Test (IVGVT) test article’s “free-free boundary condition” suspension system.



Assembly of Hydraulic Power Unit for HDS



HDS Power Unit Powered at Vendor

- ***Ares I-X Roll Control System (RoCS) Element:*** Activities specific to the RoCS Element include:
 - Fuel and oxidizer loading in Module B was completed at the Kennedy Space Center (KSC). The safety cap welding over the propellant tank fill valves was performed by Teledyne, and x-ray and dye penetrant testing is underway.
 - Gas chromatograph analysis of Peacekeeper Booster Cartridge (BC) propellants shows strong signature of the desired diphenylamine inhibitor, indicating little degradation of the BCs, and thus supporting the waiver that the BCs are still good beyond their shelf life. The Pressurization System planned for vibration testing had a successful planned opening of the



- pyro isolation valve using one of the flight BCs, which also strengthened the ordnance shelf-life waiver.
- The fairing modification work was formally approved to be performed at KSC. Teledyne is preparing the modification kit and drawings, and implementation planning discussions are ongoing between KSC and Teledyne.
 - Bi-prop valve vibration testing is underway, two of three axes have been completed with the third axis completion being imminent.
 - Eleven more verification sheets were submitted to System Engineering and Integration (SE&I) for review. Eight more are outstanding, awaiting completion of vibration and cold flow testing.

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

...and as of this Ares Projects Weekly Summary, there are only 99 days until the first Ares I test flight, Ares I-X!!!