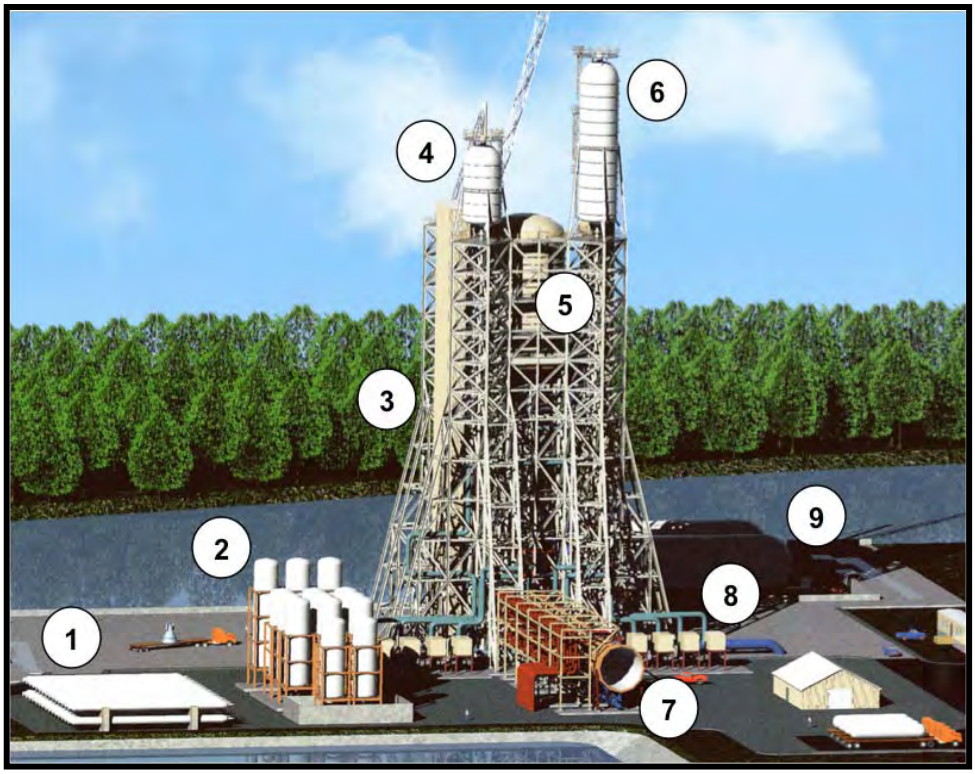
A First Stage Development Motor 1 (DM-1) test firing was successfully completed on September 10, 2009, the culmination of a 3-year effort. The test firing will provide significant risk reduction for the new motor features on the Ares I. The test firing is also a major project milestone as it marks the first test of full-scale flight hardware in the development of the Ares I.

Recent activities specific to the Elements include:

Upper Stage Engine (USE)

- ***Upper Stage Engine, Assembly & Test:*** Construction of the A-3 Test Stand at Stennis Space Center (SSC) continues with major component fabrication at contractor facilities. The artist concept of A-3 in the figure below shows the major elements of the stand.

  Figures 1–3 show fabrication of the Test Cell and Diffuser components.



Major A-3 Elements shown in Artist Concept

1. Gaseous nitrogen bottles for Chemical Steam Generation (CSG) System pressurization
2. CSG propellant tanks: Three liquid oxygen (LOX), nine water, and two isopropyl alcohol tanks
3. Tower structure
4. Engine propellant LOX tank
5. Test Cell
6. Engine propellant liquid hydrogen (LH2) tank
7. Diffuser exit (Inlet at bottom of Test Cell)
8. CSG Cans
9. LH2 barge dock (LOX barge dock not shown)

Figure 1. A-3 Diffuser Steam Ejector Nozzles

The nozzles are designed to pull a vacuum in the Test Cell by ejecting steam through the diffuser. They are located in two rings, one in the vertical section of the diffuser near the bottom of the test and the other in the horizontal section downstream of the elbow. The combined flow rate of the ejectors is approximately 500 pounds per second.

The inner wall of the diffuser is cooled by flowing water through an outer jacket.

Figure 2. Sections of the A-3 Diffuser Jacket; Note water supply and return ports

Figure 3. One of three A-3 Test Cell sections

The Test Cell provides a "space-like" environment for the engine during testing. It is approximately 45 feet in diameter and 50 feet tall. The sides are comprised of three sections that will be lifted into place onto the test stand individually.

Project Integration

- ***Junior Ambassador Presentation:*** The Ares outreach team completed the new Ares Junior Ambassador Presentation for grades 3–5 and presented it to the Ares Communications Integrated Product Team. Review comments were incorporated and the product finalized September 4. This presentation condenses and simplifies the key points in the general Ares Ambassador Presentation and includes graphics and talking points tailored to younger students.

The Ares Projects remember those who gave their lives on 9/11/2001.

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