





A-3 Test Stand – preparing for the future

Almost two decades after the last Apollo mission to the moon, there is general consensus that the time has come for the United States to travel beyond low-Earth orbit once more. Whatever forms those plans take, NASA's John C. Stennis Space Center is preparing to play a central role.

In anticipation of that role, NASA announced in May 2007 that it would build a new stand at Stennis for testing the next generation of rocket engines that will carry humans beyond low-Earth orbit. As the first major test structure constructed at Stennis since the 1960s, the new A-3 stand will allow operators to test engines at simulated altitudes of up to 100,000 feet. Such testing is critical, since engines that carry humans beyond low-Earth orbit must be able to fire in space. The simulated altitudes will be generated by using a network of chemical steam generators to reduce pressure within the stand's engine test cell, thus simulating high-altitude vacuums.

Groundbreaking for the A-3 Test Stand was held in August 2007. By the spring of 2008, the test stand site had been cleared and foundation work was complete. In April 2009, workers celebrated the erection of some 4 million pounds of open-frame structural steel to create the test stand tower. By year's end, general construction work was proceeding, and early work had begun for installation of the test cell diffuser. The 300-foot tall stand, which is designed to withstand up to 1 million pounds of thrust, is scheduled to be completed and activated in 2012.

However, even before completion of that task, Stennis has been contributing to the future of American space exploration. Operators performed a series of power pack tests in 2008, providing critical information for development of a new generation of rocket engines. The power pack is the gas generator and turbopumps that perform a rocket engine's major pumping and combustion work. Stennis now is preparing its A-1 Test Stand for additional testing of next-generation rocket engines and related components.

In addition, engineers in the E Test Complex at Stennis have been conducting important early tests for the A-3 Test Stand project. The tests are designed to validate the design of the stand components and allow engineers to work out issues early in the process.

When the A-3 Test Stand is complete, Stennis will have unique capabilities. The new stand will allow operators to conduct full-duration tests (the amount of time the engines will have to fire during an actual flight) on full-scale engines and to gimbal the engines (rotate them in the same way they must move during flight to ensure proper trajectory), all at the simulated high altitudes produced by the chemical steam generators. No other stand in the country allows all of those aspects at such simulated altitudes at the same time.

During the Apollo Program in the 1960s, it often was said that however humans choose to go to the moon, they would have to go through south Mississippi, where the engines to power the missions were tested. Four decades later, that fact remains true. Whatever method the United States chooses to travel beyond low-Earth orbit once more, wherever the mission may go, the journey will pass through south Mississippi and John C. Stennis Space Center, the country's premier large rocket engine testing facility.

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