

Orion's launch abort system motor exceeds expectations

March 10 2015, by Sasha Congiu



On March 4, Orbital ATK, in collaboration with NASA and Lockheed Martin, completed its latest test of Orion's Launch Abort System attitude control motor. This is an artist's concept of the attitude control motor in operation during an abort. Credit: NASA

Three seconds. That's all it took for the attitude control motor of NASA's Orion Launch Abort System (LAS) to prove that its material can survive not only the intense temperatures, pressures, noise and vibrations experienced during a launch emergency but also 40 percent

beyond. The LAS is being designed to bring a crew to safety should there be a problem in the launch pad or during ascent.

"We tested over the maximum expected environments to assure the motor could withstand an abort emergency," explained LAS chief engineer Wayne Walters.

On March 4, Orbital ATK, in collaboration with NASA and Lockheed Martin, completed its latest test of one of the most complex solid rocket systems ever built for the LAS.

"I am very proud of the team's successful test," Walters said. "This motor program is making great achievements due primarily to management support and a highly integrated engineering team. These boundary extending tests are paving the way to a successful qualification program for [human space flight](#)."

Built by Orbital ATK, the attitude control motor consists of a solid propellant gas generator, with eight proportional valves equally spaced around the outside of the three-foot diameter motor. Together, the valves can exert up to 7,000 pounds of steering force to the vehicle in any direction upon command from the Orion – the spacecraft that will one-day take humans to an asteroid and eventually Mars.

Despite being one of the last in line of a series, this test was the first of its kind.

"For the first time, the motor demonstrated capability far enough above what it would see in [flight](#)," said Kevin Rivers, deputy director for the Flight Projects Directorate at NASA's Langley Research Center in Virginia. "We can now have absolute confidence that the motor would perform flawlessly during a crewed mission."

Engineers at Orbital ATK's facility in Elkton, Maryland, tested one of the valves of the [attitude control motor](#) during the test, which would be used to keep the LAS, with the crew module, on a controlled flight path if it needed to jettison and steer away from the launch vehicle in an emergency. It also reorients the module for parachute deployment and landing.

"Although we hope the system will never be needed, it is comforting to know we are designing a system that ensures our astronauts are safe when they go on missions beyond low-Earth orbit," said LAS flight dynamics lead John Davidson.

The LAS is managed out of Langley in collaboration with NASA's Marshall Space Flight Center in Alabama and NASA contractor Lockheed Martin.

Provided by NASA

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