NASA, Lockheed Martin Team Launch Crew Safety To New Heights

Orion Launch Abort System Tests the Limits of New Technologies

Within 97 seconds of an initial 500,000-pound blast of solid rocket motor thrust, Orion completed its first successful flight test of the launch abort system at the U.S. Army's White Sands Missile Range near Las Cruces, New Mexico at 7 a.m. MT.

Lockheed Martin , the prime contractor to NASA for the Orion crew exploration vehicle, led the industry team's development effort on this new system that will significantly improve crew safety for future human space flight. The LAS is designed to immediately pull the crew module away from the launch vehicle during an emergency on the pad or during the climb to orbit.

After receiving the planned abort command at 7 a.m., the LAS instantly activated and the abort motor fired, thrusting the 55.5-ft-tall launch abort vehicle and crew module mock-up off the pad, reaching a speed of about 445 mph in three seconds. More than 690 measurements were taken real-time during the test, providing data only gained through early test flights.

"It was an impressive launch," said Cleon Lacefield, Lockheed Martin vice president and Orion program manager. "This test validated the amazing performance capability of Orion's launch abort system. The entire industry team did an excellent job designing, building and integrating this extremely complex system."

With contributions from key subcontractors Aerojet, Alliant Techsystems, Honeywell and Orbital Sciences Corporation, the Lockheed Martin Orion team integrated technical expertise in solid rocket motors, separation mechanisms, avionics, spacecraft adapter structures, ordnance systems, electrical systems, harnesses and design integration to ensure the LAS provided optimal escape capability for a crew. The crew module boilerplate used for the flight test included Honeywell avionics and Lockheed Martin software for onboard control of abort sequencing and inertial navigation.

"This new system offers the highest thrust and acceleration escape system ever tested and is the only system of its kind in the world," said Roger McNamara, Lockheed Martin director, Launch Abort System. "Technology 'firsts' we incorporated into the LAS design include a reverse-flow, high-thrust human-rated rocket motor and the world's largest and only human-rated controllable solid rocket motor."

The abort motor with revolutionary reverse flow nozzles, pulls the Orion capsule away from the launch vehicle - something America has never built before and the first to be human-rated. The attitude control motor provides directional control for the vehicle, the first-time a solid rocket motor has been designed to vector, steer and control. The attitude control motor also provides directional control for the jettison motor, which separates the crew module from the LAS so that parachutes can deploy for a safe landing.

NASA selected Lockheed Martin in 2006 to develop the Orion crew exploration vehicle as the flagship for the nation's next generation spacecraft to send humans to low Earth orbit and beyond. Orion is currently on schedule for an early demonstration flight in 2013 to prove the vehicle in low Earth orbit before taking on more challenging deep space exploration missions. Risk reduction testing, such as the Pad Abort-1 flight test, has been an ongoing effort throughout Orion's development phase to maximize mission success and significantly improve crew safety.

An abort motor system has been used twice by the Russians, once during a rocket failure on the pad and the other during launch near the end of flight. The cosmonauts walked away in both instances, proving how critical these systems can be for safe human space flight.

"Although this system is designed for crew safety, we hope it is only used during flight tests like these," Lacefield commented. "The data we collect from this launch will be vital as we continue to meet milestones and work towards completing Orion's Critical Design Review next year."

About Lockheed Martin

The Lockheed Martin Orion Project office is based in Houston, Texas, near NASA's Johnson Space Center. The Orion industry team includes five major subcontractors as well as an expansive network of minor subcontractors and small businesses working at 88 facilities in 28 states. In addition, the program contracts with over 500 small businesses across the United States through its expansive supply chain network.

Headquartered in Bethesda, Md., Lockheed Martin is a global security company that employs about 136,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The Corporation reported 2009 sales of $45.2 billion. http://www.lockheedmartin.com/

About Orbital Sciences Corporation

Orbital provides design and development of several Orion launch abort system components. Orbital is one of the world's leading space technology companies, specializing in the development and operation of small and medium size satellite and launch systems. Additional information can be found at http://www.orbital.com/

About Alliant Techsystems (ATK)

ATK provides the abort and the attitude control motors for Orion's launch abort system. ATK is a premier aerospace and defense company with more than 18,000 employees in 22 states, Puerto Rico and internationally, and revenues of approximately $4.8 billion. More information can be found at http://www.atk.com/

About Aerojet

The developer of the launch abort system's jettison motor, Aerojet, a GenCorp company, is a world-recognized aerospace and defense leader principally serving the missile and space propulsion, defense and armaments markets. http://www.aerojet.com/ or http://www.gencorp.com/

About Honeywell

Honeywell provides hardware and software for Command and Data Handling systems, displays, controls, and navigation. Based in Phoenix, Arizona, Honeywell's aerospace business is a leading global provider of integrated avionics, engines, systems and service solutions. Additional information about Honeywell can be found at www.honeywell.com.

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