

LockMart Test Fires Second Falcon Small Launch Vehicle Hybrid Motor

June 21 2005

Lockheed Martin successfully test-fired a hybrid motor as part of the Falcon Small Launch Vehicle (SLV) program at the Air Force Research Laboratory (AFRL), Edwards Air Force Base, Calif. on June 10.

This was the second SLV hybrid motor firing that Lockheed Martin has conducted this year at Test Stand 2-A.

The hybrid motor that was tested is a full-scale test version of the upper stage motor on Lockheed Martin's SLV and measures 11 feet in length and five feet in diameter. The motor fired for its planned duration of 120 seconds, and preliminary data indicate that test objectives were met.

The duration of the firing was twice the length of time of the first firing that occurred January 21, and Lockheed Martin believes that the 120-second test was the longest burn of a hybrid motor at this scale. The fuel grain was designed such that the 120-second firing represented over 170 seconds of run time for the flight configuration.

The goal of the Falcon SLV program is to develop and demonstrate an affordable and responsive space lift capability – one that can quickly launch a small satellite into Low Earth Orbit.

"This second test was another impressive firing of a multi-port, multi-row hybrid motor," said Paula Hartley, SLV propulsion testing manager, Lockheed Martin.

"We are extremely satisfied with the results. Once again, the Lockheed Martin and AFRL team worked seamlessly together to install the motor in the test stand, check out the test equipment and test fire the motor in a week - a phenomenal accomplishment."

Lockheed Martin built the hybrid motor in the same building where it constructs the Space Shuttle External Tank at the NASA Michoud Assembly Facility in New Orleans.

"The preliminary data collected from this test indicate that the hybrid motor will meet or exceed the system's performance allocation," said Joe Arves, program SLV chief engineer, Lockheed Martin.

"In addition, this firing serves as a significant accomplishment toward reducing the program's technical risk."

The Defense Advanced Research Projects Agency (DARPA) and the U.S. Air Force are leading the SLV program, and NASA is also participating and providing funding.

"This second test represents a significant step forward and again points out the advantages of a hybrid motor – one that is environmentally benign, affordable and easy to operate - which we believe are key to developing a responsive and low-cost launch vehicle for the SLV," said Bob Simms, Falcon SLV director and program manager, Lockheed Martin.

Hybrid motors combine the best of solid and liquid propulsion systems, typically using an inert fuel and liquid oxygen to generate thrust. Hybrid propulsion offers significant gains in safety, throttle-ability, cost and affect on the environment.

Lockheed Martin has developed hybrid propulsion systems since 1989

and performed over 600 motor firings, including a successful launching of a 60,000-pound-thrust sounding rocket from NASA Wallops Island, Va. in 2003.

DARPA and the Air Force awarded Lockheed Martin an \$11.7 million contract last year to conduct a preliminary design and development effort to refine its SLV design and conduct riskreduction testing. Lockheed Martin is one of four teams selected for this phase.

Later this summer, DARPA will select the teams to continue work on the SLV design. That phase of the Falcon program includes a flight demonstration in 2007/2008.

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