



Science News

Next NASA Moon Mission Completes Major Milestone

ScienceDaily (Jan. 5, 2009) — NASA's Lunar Reconnaissance Orbiter, or LRO, has successfully completed thermal vacuum testing, which simulates the extreme hot, cold and airless conditions of space LRO will experience after launch. This milestone concludes the orbiter's environmental test program at NASA's Goddard Space Flight Center in Greenbelt, Md.

The thermal vacuum testing on the spacecraft took about two months. The orbiter, which was built at Goddard, was subjected to the extreme temperature cycles of the lunar environment as engineers conducted simulated flight operations.

"We have cooked LRO, frozen it, shaken it, and blasted it with electromagnetic waves, and still it operates," said Dave Everett, LRO mission system engineer at Goddard. "We have performed more than 2,500 hours of powered testing since January, more than 600 of that in vacuum."

The first two checks were the spin and vibration tests. The spin test determined the spacecraft's center of gravity and measured characteristics of its rotation. During vibration testing, engineers checked the structural integrity of the spacecraft aboard a large, shaking table that simulated the rigorous ride the orbiter will encounter during liftoff aboard an Atlas rocket.

Next, the orbiter was subjected to acoustics testing. The bagged spacecraft was placed near wall-sized speakers that simulate the noise-induced vibrations of launch. Following acoustics testing, LRO underwent tests that simulated the orbiter's separation from the rocket during launch. The spacecraft also underwent electromagnetic compatibility testing to ensure internal and external electrical signals do not interfere with its critical functions.

LRO will be shipped to NASA's Kennedy Space Center in Florida in early 2009 to be prepared for its April 24 launch aboard an Atlas V rocket. Accompanying the spacecraft will be the Lunar Crater Observation and Sensing Satellite, a mission that will impact the moon's surface in its search for water ice.

Goddard is building and managing the Lunar Reconnaissance Orbiter for NASA's Exploration Systems Mission Directorate in Washington.

Adapted from materials provided by [NASA/Goddard Space Flight Center](#).

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LRO spacecraft in the Goddard Space Flight Center cleanroom. (Credit: NASA/GSFC)