



countdown

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Constellation Program ready for Phase A to begin

Lunar spacecraft passes tests before delivery to Kennedy

◆ **Constellation Update:** NASA engineers and scientists completed a milestone review June 20 that will help determine the systems needed to return humans to the moon and establish a lunar outpost. The nine-month study looked at possible lunar mission scenarios and compared them to the capabilities of the emerging Ares V heavy lift launch vehicle and the Altair lunar lander design concepts. This review of those findings, led by the Constellation Program Office at NASA's Johnson Space Center in Houston, established all the technical parameters that will be needed to begin Phase A, the first phase in preparing vehicle requirements.

During this phase, the Ares V and Altair Project teams will take what was learned from the Lunar Capability Concept Review and baseline the needs for lunar missions, establish the design needs and determine plans for advancing the technologies needed to be successful. Phase A will culminate in a Systems Requirements Review for NASA's lunar transportation architecture, tentatively planned for 2010.

The review refined early configurations of the Ares V rocket to ensure its capability to deliver the Altair lunar lander, four astronauts and cargo anywhere on the moon and return the crew to Earth at any time. To accomplish those objectives, the current configuration of the Ares V will use six RS-68B liquid oxygen and liquid hydrogen engines on a core stage along with two five-and-one-half segment solid propellant rocket boosters, which are a direct evolution from the first stage of the Ares I rocket.

The Ares V upper stage will propel the Orion crew capsule and Altair to the moon using the same J-2X engine as the Ares I crew launch vehicle. The Ares V will stand about 381 feet tall and be able to send more than 156,600 pounds of cargo and components into orbit to the moon, and later to Mars or other destinations.

Altair will be capable of landing four astronauts anywhere on the moon, providing life support and a base for the first week-long surface exploration missions, and returning the crew to the Orion spacecraft for the ride home to Earth. A variant of the lunar lander will serve as an autonomous cargo carrier, taking modular outpost components, lunar rovers, and scientific equipment to the moon's surface.

◆ **ELV Update:** Engineering teams are conducting final checkouts of the Lunar Crater Observation and Sensing Satellite, known as LCROSS, that will take a significant step forward in the search for water on the moon.

The mission's main objective is to confirm the presence or absence of water ice in a permanently shadowed crater near a lunar polar region.

A major milestone, thermal vacuum testing of the LCROSS spacecraft, was completed June 5 at the Northrop Grumman facility in Redondo Beach, Calif.

To simulate the harsh conditions of space, technicians subjected the spacecraft to 13.5 days of heating and cooling cycles during which temperatures reached as high as 230 degrees Fahrenheit and as low as minus 40 degrees. Previous testing for the LCROSS spacecraft

included acoustic vibration tests. Those tests simulated launch conditions and checked mating of connection points to the Atlas V rocket's Centaur upper stage and the adapter ring for the Lunar Reconnaissance Orbiter, known as LRO.

The satellite currently is undergoing final checkout tests. After all tests are complete, the LCROSS spacecraft will be prepared for delivery to Kennedy for launch processing and integration onto the Atlas V as a secondary payload to LRO. Both spacecraft are scheduled to launch from Kennedy in late 2008.



■ **Weight Watchers at Work Program** — Weight Watchers is starting a new 16-week session on July 10. You can sit in on a meeting for free July 3, ask questions and

discover what Weight Watchers is all about. The meetings are held from 11:30 a.m. to noon every Thursday in the HQ Building/Room 2254. If you have specific questions, please contact Marilyn Clark at 504-2979.

■ **Reminder** — The KSC Health Education and Wellness Program will host a Leukemia and Lymphoma Symposium 11 a.m. – 12:45 p.m. **today** in the Mission Briefing Room located in the O&C Building.

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