NASA Successfully Tests Parachute for Ares Rocket

July 25 2008

(PhysOrg.com) -- NASA and industry engineers have successfully completed the first drop test of a drogue parachute for the Ares I rocket. The drogue parachute is designed to slow the rapid descent of the spent first-stage motor, cast off by the Ares I rocket during its climb to space.

The successful test is a key early milestone in development and production of the Ares I rocket, the first launch vehicle for NASA's Constellation Program that will send explorers to the International Space Station, the moon and beyond in coming decades. The drogue parachute is a vital element of the Ares I deceleration system and will permit recovery of the reusable first-stage motor for use on future Ares I flights.

Engineers from NASA's Marshall Space Flight Center in Huntsville, Ala., managed the team that conducted the first Ares I drogue chute test on July 24 at the U.S. Army's Yuma Proving Ground near Yuma, Ariz. This is the sixth in an ongoing series of tests supporting development of the Ares I parachute recovery system, which includes a pilot chute, drogue and three main parachutes. The next drogue parachute test is scheduled for October, and testing will continue through 2010. The drogue parachute also will be used during NASA's first test flight for the Ares rocket, the Ares I-X, scheduled to take place in 2009.

Researchers dropped the 68-foot-diameter drogue parachute and its 36,000-pound load -- simulating the first-stage motor -- from a U.S. Air Force C-17 aircraft flying at an altitude of 25,000 feet. The parachute

and all test hardware functioned properly and landed safely.

The parachutes that serve as the Ares I recovery system are similar to the four-segment space shuttle boosters, but they have been redesigned to accommodate new requirements of the Ares I first stage. Dramatically larger and more powerful than the shuttle's boosters, the Ares I will have a five-segment solid rocket booster -- causing it to fall faster from a much higher altitude after separation from the launch vehicle.

During launch, the Ares I first-stage booster will separate from the upper stage at an elevation of 189,000 feet, approximately 126 seconds into flight. After freefalling to approximately 15,740 feet, the booster's nose cap will be jettisoned, releasing the pilot parachute, which in turn releases the drogue, slowing the stage's descent from 402 mph to 210 mph and maneuvering the booster into a vertical position. Finally, a cluster of three main parachutes, each 150 feet in diameter, will be deployed. The main parachutes continue to slow the booster to splashdown in the Atlantic Ocean.

Beginning in 2015, the Ares I rocket will launch the Orion crew capsule and six astronauts, and small pressurized cargo payloads, to the International Space Station. The Ares I rocket, an in-line, two-stage rocket configuration, will be powered by the first stage solid rocket motor for the first two minutes of launch.

ATK Launch Systems near Promontory, Utah, is the prime contractor for the first stage booster. ATK's subcontractor, United Space Alliance of Houston, is responsible for design, development and testing of the parachutes at its facilities at NASA's Kennedy Space Center, Fla.

NASA's Johnson Space Center in Houston manages the Constellation Program, which includes the Ares I rocket, the Ares V heavy-lift launch vehicle, the Orion crew capsule, the Altair lunar lander. Marshall Space

Flight Center manages the Ares Projects. The U.S. Army's Yuma Proving Ground provides the test range, support facilities and equipment to NASA for parachute testing.

Provided by NASA