

NASA Puts Space Shuttle External Tank to the Test

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NASA engineers and managers are evaluating the data from today's Space Shuttle Discovery External Tank (ET) tanking test at Kennedy Space Center (KSC), Fla. The tanking test was yet another milestone in NASA's efforts to return the Shuttle safely to flight.

The 11-hour test also readied Discovery's main propulsion system and allowed technicians operating the hardware to gain first-hand experience on the redesigned tank. The test allowed crews to evaluate the overall operation of ground systems in preparation for launch of Discovery's Return to Flight mission (STS-114) planned for next month.

"With the completion of this tanking test, NASA is one step closer to returning the Space Shuttle fleet to flight," said Michael Kostelnik, NASA's deputy associate administrator for International Space Station and Space Shuttle Programs. "Although we have further milestones to complete before we fly, we are proud of the technical advancements we have made the last two years to ensure a safe mission," he said.

The tanking test consisted of ground crews at KSC filling the ET with liquid oxygen and liquid hydrogen fuel to evaluate how the Shuttle, tank, Solid Rocket Boosters and ground systems performed when the tank was filled with two super-cold propellants. During the test, NASA's ice/debris team thoroughly inspected the fueled tank looking for frost and ice buildup. Although ice is expected to form on the ET, the team has strengthened its inspection criteria based on results from tests performed at several NASA centers and other research facilities.

"This test provides another data point for us to consider," said Neil Otte, chief engineer for the External Tank Project Office at NASA's Marshall Space Flight Center, Huntsville, Ala. "The information we gain will give us added confidence in the tank," he added.

The tanking test is not required by NASA to certify redesigns made on the ET. It's done to demonstrate the effectiveness of the redesigned tank bipod heater system. It replaced the original bipod ramp design, which had foam on it. Today's test also checked out the new "drip-lip" design that's intended to reduce the potential for ice accumulation on the joints that allow the tank's fuel line to adjust.

Eight similar tests have been conducted. Seven of those tests were performed from 1981 to 1983, the first three years of the Shuttle program. The first super-lightweight ET was tested prior to its flight on STS-91 in June 1998. There have also been seven flight readiness firings that included tanking and firing the main engines.

During launch, the ET delivers 535,000 gallons of liquid hydrogen and oxygen propellants to the three Space Shuttle Main Engines. The ET is the only component that cannot be reused. It is covered by polyurethane-like foam that insulates the propellants, keeps ice from forming on the exterior and protects its aluminum skin from aerodynamic heat during ascent.

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