NASA, Industry Partner Test 20-Meter Solar Sail System

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NASA has reached a milestone in the testing of solar sails -- a unique propulsion technology that will use sunlight to propel vehicles through space. Engineers have successfully deployed a 20-meter solar sail system that uses an inflatable boom deployment design.

L'Garde, Inc. of Tustin, Calif., deployed the system at the Space Power Facility -- the world's largest space environment simulation chamber -- at NASA Glenn Research Center's Plum Brook Station in Sandusky, Ohio. L'Garde is a technology development contractor for the In-Space Propulsion Technology Office at NASA's Marshall Space Flight Center in Huntsville, Ala. NASA's Langley Research Center in Hampton, Va., provided instrumentation and test support for the tests.

Red lights help illuminate the four, outstretched triangular sail quadrants in the chamber. The sail material is supported by an inflatable boom system designed to unfold and become rigid in the space environment. The sail and boom system is extended via remote control from a central stowage container about the size of a suitcase.

L'Garde began testing its sail system at Plum Brook in June. The test series lasted 30 days.

Solar sail technologies use energy from the Sun to power a spacecraft's journey through space. The technology bounces sunlight off giant, reflective sails made of lightweight material 40-to-100-times thinner than a piece of writing paper. The continuous sunlight pressure provides

sufficient thrust to perform maneuvers, such as hovering at a fixed point in space or rotating the vehicle's plane of orbit. Such a maneuver would require a significant amount of propellant for conventional rocket systems.

Because the Sun provides the necessary propulsive energy, solar sails require no onboard propellant, thus increasing the range of mobility or the capability to hover at a fixed point for longer periods of time.

Solar sail technology was selected for development in August 2002 by NASA's Science Mission Directorate in Washington. Along with sail system design projects, the Marshall Center and NASA's Jet Propulsion Laboratory in Pasadena, Calif., are collaborating to investigate the effects of the space environment on advanced solar sail materials. These are just three of a number of efforts undertaken by NASA Centers, industry and academia to develop solar sail technology.

Solar sail technology is being developed by the In-Space Propulsion Technology Program, managed by NASA's Science Mission Directorate and implemented by the In-Space Propulsion Technology Office at Marshall. The program's objective is to develop in-space propulsion technologies that can enable or benefit near- or mid-term NASA space science missions by significantly reducing cost, mass and travel times.