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ORBITEC Expands VORTEX Rocket Engine Family with Successful Demonstration of New Propellants

MADISON, Wis. (November 4, 2015) - [Sierra Nevada Corporation's](#) (SNC) wholly-owned subsidiary [Orbital Technologies Corporation](#) (ORBITEC) recently completed successful testing and demonstration of three different propellant combinations for its existing 30,000 pound thrust vortex rocket engine. Completing this advancement in less than a year, ORBITEC is rapidly progressing its offering of engines for orbital maneuvering, upper stage engines that ignite at high altitude, and small-to-medium-scale air and ground launch stage engines.

"We are extremely optimistic about the performance and broad application of the [vortex](#) engine which, during tests, exhibited very smooth and stable combustion and Specific Impulse efficiencies," said Tom Crabb, ORBITEC's executive vice president and chief operating officer. "With ORBITEC's natural ability to rapidly iterate design and testing, these performance results should quickly lead to refinement and qualification of engines for next generation launch systems and to continued scaling for larger engines."

These tests demonstrate the ability to transition use of different propellant combinations in the same core rocket engine design with slight changes to accommodate a specific combination of fuel and oxidizer, including propane and kerosene fuels with nitrous oxide (laughing gas) and liquid oxygen oxidizers. This latest development offers customers a suite of engines scalable to higher thrust levels and customer-selected fuel combinations from a single core rocket engine design. ORBITEC's patented vortex rocket engines utilize a unique swirling propellant flow to naturally cool the engine walls, allowing for the development and manufacture of simpler, low-cost, light-weight and more robust rocket engine systems.

"SNC is very pleased that ORBITEC has exceeded expected performance and efficiency targets for this rocket engine," said [Mark N. Sirangelo](#), corporate vice president of SNC's Space Systems. "ORBITEC is going to apply their patented vortex engine technology to develop a new family of rocket engines that will serve as booster and upper stage engines for a variety of customers such as the U.S. Air Force, NASA and other commercial space companies."

ORBITEC, with support from SNC, is investing in all aspects of the rocket engines including valves, turbomachinery and other engine components. Future work on this

ORBITEC program will include developing vortex engines to produce 65,000 pounds of thrust, combusting liquid oxygen and hydrogen, and liquid oxygen and methane, and to produce 75,000 pounds of thrust using liquid oxygen and kerosene, another step toward manufacturing larger U.S. engines that break current paradigms in low-cost access to space.

About Orbital Technologies Corporation (ORBITEC)

ORBITEC, a wholly-owned subsidiary of Sierra Nevada Corporation, is a leading high technology aerospace company based in Madison, Wisconsin. ORBITEC offers commercially mature solutions and strong capabilities in: Propulsion, Propellant, Power Systems, Life Support and Environment Control, Bio-based products and Production Systems and Next Generation Fire Suppression. The company has converted research and development initiatives into valuable products that provide significant cost advantages, superior functionality and high reliability. ORBITEC was acquired by Sierra Nevada Corporation in 2014. For more information visit www.orbitec.com

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About Sierra Nevada Corporation

Sierra Nevada Corporation (SNC), headquartered in Sparks, Nevada, delivers technology and teams designed to connect and protect, through innovative solutions in aircraft, aerospace, electronics, cyber and avionics. With a track record of success spanning five decades, SNC has been honored as one of America's fastest-growing private companies, "The Top Woman-owned Federal Contractor in the U.S.," and among "The World's Top 10 Most Innovative Companies in Space." SNC operates under the leadership of President Eren Ozmen and CEO Fatih Ozmen, with a workforce of more than 3,000 personnel in 33 locations in 18 states and business divisions in England, Germany and Turkey.

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