

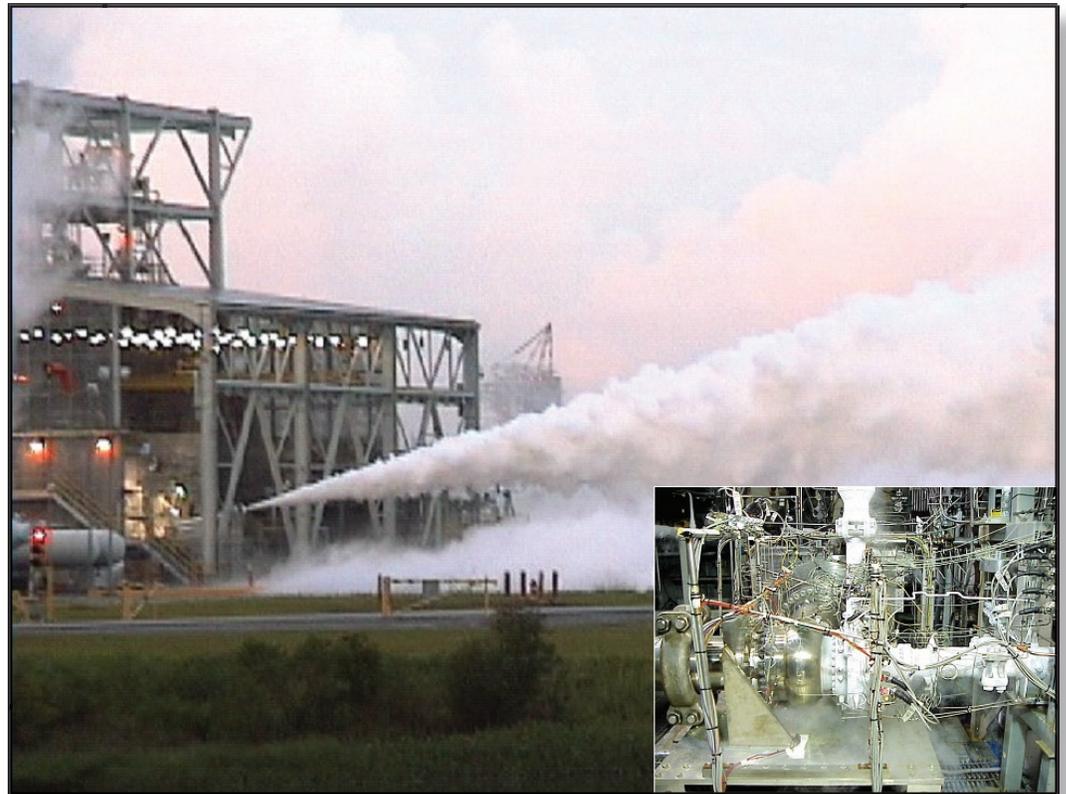


Air Force Research Laboratory | AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

LIQUID OXYGEN TURBOPUMP TESTING SUCCESSFUL



The Propulsion Directorate successfully completed testing of critical components for integration into the world's first full flow cycle hydrogen/oxygen boost engine. The Integrated Powerhead Demonstration (IPD) technology development provides the world's first hydrogen-fueled rocket engine with oxygen-rich staged combustion. IPD is currently the only hydrogen boost rocket engine development program in existence today.



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Accomplishment

Directorate tests of the IPD program were completed at the National Aeronautics and Space Administration's (NASA) Stennis Space Center test facilities in Mississippi. These tests mark the first advancements in boost engine technology since the space shuttle's main engine was initially developed in the 1970s. IPD technology is the first American designed and fabricated oxygen-rich turbine drive pump. The series of tests finished with a hot-fire test that demonstrated a steady-state run of 95% power, which is considered the most challenging of the series.

NASA's Next Generation Launch Technology program is also a cornerstone of the IPD technology. The program provides technology advances needed to overcome two major technical problems: turbine life and bearing wear. Hydrostatic bearings are the key innovations in the high-performance turbomachinery that fully supports the rotor of both the fuel and oxidizer pump.

Background

The IPD program is part of a national program known as the Integrated High Payoff Rocket Propulsion Technology (IHRPT) program involving all Department of Defense services, NASA, and American rocket industry partners. IHRPT's intent is to double the performance and capabilities of rocket propulsion systems over the 1993 state-of-the-art systems and to decrease costs of access to space for military and commercial customers.

Propulsion
Emerging Technologies

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-PR-30)