



# Lewis NEWS

JOURNEY TO EXCELLENCE

Volume 33 Issue 4 May 1996

*Changing the way NASA does business*

## Plum Brook Station able to pay its own way

By Kristin K. Wilson

NASA Lewis' Plum Brook Station in Sandusky, OH, is proving that survival is possible in the absence of big budgets. While NASA faces funding cuts and downsizing, Plum Brook continues to provide unique aerospace testing services while paying its own way, a philosophy NASA Administrator Dan Goldin is promoting for the rest of the Agency.

"The user pays all costs related to the test program," said Robert Kozar, chief of the Plum Brook Management Office. "We started doing business that way in 1987, and we've operated that way ever since."

The 6,000-acre facility was acquired by the government in 1941 for the manufacture of World War II munitions. It was taken over in 1955 by NASA Lewis, which needed a place to test high-energy rocket engines and nuclear power systems.

At its peak, 600 employees worked at Plum Brook. It was closed in 1973, however, because of budget cuts that deferred most of the programs in which Plum Brook was involved. Plum Brook's unique facilities—many one-of-a-kind in the world—were preserved in a standby condition for anticipated future use.

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**The NASA Lewis Fire Department was closed on April 14 following a one-year cost assessment. See page 5.**

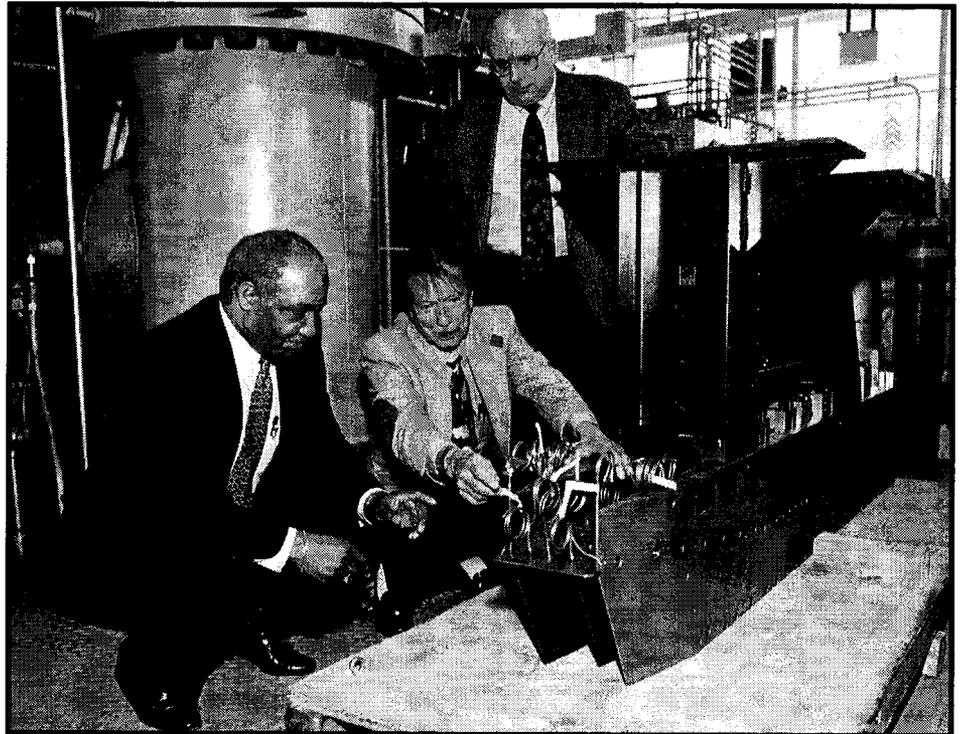


Photo by Marvin Smith

Donald Campbell (left), director of NASA Lewis; Bill Pack, manager of Plum Brook Station's Hypersonic Tunnel Facility (HTF); and Frank Berkopec, Advanced Propulsion Applications Office, examine the rocket-based combined cycle (RBCC) engine model before it is installed into the HTF. The HTF recently was reactivated to support RBCC tests.

## Lewis to play integral role in U.S./Russian research program

A modified Russian supersonic passenger jet recently was "rolled out" to symbolize the start of a joint six-month flight research program between NASA, a U.S. industry team, and the Russian aerospace industry.

The Russian Tupolev Design Bureau's Tu-144LL, a supersonic flying laboratory, will carry experiments in support

of NASA's High-Speed Research (HSR) program. The HSR program, begun in 1990, teams NASA with U.S. industry to conduct research on technology that may allow the future development of a new High-Speed Civil Transport (HSCT) at the turn of the century. The U.S. industry team for the Tu-144LL project is led by Boeing with (continued on page 6)

# Plum Brook operates on full cost recovery basis

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NASA began reactivating the Plum Brook test facilities in 1987 in response to needs expressed by the Space Station program, the National Aero-Space Plane, and the Strategic Defense Initiative. At that time, NASA Lewis senior management decided that the reactivation and operation of the Plum Brook facilities would be accomplished on a full cost reimbursable basis. This meant the user would pay all costs related to the test program, including the "up front" expense of reactivating the facility from its standby mode.

The Defense Nuclear Agency, General Dynamics, and Martin Marietta were among the first to use Plum Brook's facilities such as the 120-foot tall Space Power Facility—the largest of its kind in the world—which tests large space-bound hardware, in a vacuum environment, under orbital conditions from 250 degrees below zero to 255 degrees above. Plum Brook also has the world's largest space environment chamber for full-scale launch vehicle system testing; another test chamber for developing advanced high energy cryogenic fuels for space engines; and a wind tunnel that can simulate airspeed up to Mach 7 (approximately 5,400 mph).

According to Kozar, Plum Brook is finding it both challenging and rewarding to keep up with customer demand.

"We currently have all four of Plum Brook's 'world class' facilities reactivated and in operation. We're providing unique test services for such major efforts as the Atlas Reliability Enhancement Program (Lockheed Martin), the Delta 3 Upper Stage Development Program (McDonnell Douglas), the Space Station *Alpha* Radiator Deployment Validation, and the Mars Pathfinder Landing System Development," he said.

Plum Brook's Hypersonic Tunnel Facility—the United States' only large nonvitiated (clean air) hypersonic wind tunnel—recently was reactivated and will support tests of a rocket-based combined cycle (RBCC) engine for the Air Force's Wright Labs. This testing is part of the Air Force HyTech Program in Mach 4 to Mach 8 hydrocarbon-fueled scramjets. A NASA Lewis team in cooperation with government and

industry partners has embarked on this program to demonstrate RBCC technology, and thereby engender its use in space-launch and atmospheric flight applications.

"RBCC, also known as ejector-ramjet-based combined cycles (ERBCC), will play a critical role in moving us toward launch vehicles that will reduce launch costs by 10 to 100 times," said Frank Berkopec, Advanced Propulsion Applications Office. "NASA Lewis has long had an interest in this kind of propulsion system. By combining our expertise in airbreathing and space propulsion, and working with our counterparts at Marshall and Langley, NASA Lewis can develop the technology to dramatically increase the performance margin of the next generation reusable launch vehicle. This translates to longer life, reduced

maintenance, and lower cost launch vehicles." Berkopec added that by using combinations of airbreathing and rocket systems there is great potential to provide a significant performance margin over systems with just rockets.

A team of engineers and technicians representing NASA Lewis, the Air Force, and the industry team of Aerojet/Lockheed Martin/GASL will conduct the RBCC tests for the Air Force scramjet program. An additional NASA Lewis team of engineers and designers is working with an Agencywide team to develop this technology for launch applications. Initial testing is set to begin June 1.

*Look for information on the progression of the RBCC technology program in upcoming issues of the Lewis News.* ♦

## Director of Microgravity visits Lewis



Photo by Marvin Smith

*Pictured left to right: Marty Kress, deputy director of Lewis; Jerry Barna, deputy director of the Space Flight Systems Directorate; Robert Rhome (pointing), director of NASA's Microgravity Science and Applications Division at Headquarters; and Bill Masica, chief of the Space Experiments Division, participate in a demonstration of Lewis' Telescience Support Center, a facility that supports real-time operations for Lewis-sponsored payloads on board the space shuttle. While at Lewis, Rhome also presented an overview of the Agency's Microgravity Program.*