



SPACE CENTER

Roundup

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NASA JSC 2002e38910 photo by Robert Markowitz

Several new JSC technologies were given a trial run in the fifth Remote Field Site Test in September. During this test, JSC's Dr. Dean Eppler evaluates the walking mobility of the MK III suit while being monitored by a 'Bio-vest' developed by Stanford University. See more images from the tests on pages 4 and 5.

George W. S. Abbey announces retirement



George W.S. Abbey recently announced his retirement from NASA, ending a distinguished federal service career that spanned a half-century.

His retirement will be effective Jan. 3, 2003.

Abbey leaves the Agency after a highly decorated aerospace career, which included the Medal of Freedom, the nation's highest civilian award, for his role on the Apollo 13 Mission Operations Team.

In February 2001, Abbey left his post as JSC Center Director when he became the Senior Assistant for International Issues reporting to the NASA Administrator. Subsequently, he was appointed as a Senior Visiting Fellow at the James Baker Institute for Public Policy at Rice University.

"George helped to shape some of NASA's most difficult programs and missions as a true innovator and pioneer," Administrator Sean O'Keefe said. "Throughout his eminent career, George distinguished both himself and the Agency. He leaves behind a legacy of excellence and dedication that the hardworking people of NASA will follow for years to come."

Born in Seattle, Abbey received his bachelor's degree in general science from the U.S. Naval Academy, Annapolis, Md., in 1954, and a master's degree in electrical engineering from the U.S. Air Force Institute of Technology, Wright Patterson Air Force Base, Ohio, in 1959. A pilot in the U.S. Air Force, Abbey had more than 4,000 hours in various types of aircraft before being detailed to NASA. This year, he was selected as a Distinguished Alumnus of the U.S. Air Force Institute of Technology.

Abbey joined NASA in 1964 as an Air Force Captain assigned to the Apollo Program. In December 1967 he left the Air Force and was named technical assistant to the JSC Center Director. In January 1976, he was named Director of Flight Operations, where he was responsible for operational planning and for the overall direction and management of flight crew and flight control activities for all human spaceflight missions.

In 1983, he became Director of the Flight Crew Operations Directorate, where he continued to be responsible for all space shuttle flight crews and Center aircraft operations.

Abbey was appointed Deputy Associate Administrator for Space Flight at NASA Headquarters in Washington in March 1988. In July 1990, he was selected as Deputy for Operations and senior NASA representative to the Synthesis Group. He was charged with defining strategies for returning to the Moon and landing on Mars.

In July 1991, Abbey was appointed Senior Director for Civil Space Policy for the National Space Council in the Executive Office of the President. In 1992 he was named Special Assistant to the NASA Administrator. Then in 1994 Abbey was named Deputy Director of JSC and was subsequently selected as the JSC Center Director in 1996.

"George Abbey dedicated himself to serving his country," said JSC Director Lt. Gen. Jefferson D. Howell, Jr. "He devoted 44 years to this nation's space program, serving at JSC since 1964, and helped strengthen ties between JSC and the local community. He leaves us with a legacy that spans Apollo to shuttle to the space station. We salute his commitment to duty as we continue to reap the benefits of his vision and hard work."



**WHAT
REALLY
COUNTS!**

FROM THE DESK OF LT. GEN. JEFFERSON D. HOWELL JR.

I think that the holiday season is a great opportunity to reflect on what is really important in our lives. The reasons for having these holidays certainly give us a good starting point for this type of review.

In my own life, I have experienced occasional setbacks, which, at the time, made me feel like a miserable failure. However, these experiences forced me to take stock of my situation and realize all the wonderful blessings I enjoyed even during a time of great personal trauma.

I realized that "fame, fortune and professional success" are very fleeting, and gave me only temporary satisfaction and very little fulfillment. I found out that what really counted for me was having a wonderful wife and two children who loved me dearly. What really counted was having loyal friends who would remain so in bad times as well as good. What really counted was being able to look in the mirror and know that I had given my best effort and had kept my honor clean.

When I think about what really counts in my life I realize how incredibly blessed I am. If you give it the same thought I believe you will draw similar conclusions.

HAPPY HOLIDAYS!!

Abbey's numerous honors and awards include the NASA Exceptional Service Medal, the NASA Outstanding Leadership Medal, three NASA Distinguished Service Medals and the 1970 Medal of Freedom, which was presented by President Richard M. Nixon, for his distinguished civilian service in peacetime. In addition, he was the recipient of the Rotary National Award for Space Achievement in 1997.

"George is a demanding leader who rarely accepts compromise," O'Keefe said. "His ability to motivate and inspire his staff to work harder and smarter helped NASA write much of its human spaceflight history. His devotion to the success of America's space program is unquestionable and I wish him the best." ❖



NASA JSC S-69-33873

George Abbey receives an award from then-Center Director Robert Gilruth in 1969.

NASA JSC S84-26245

George Abbey prepares to fly a T-38 in 1984.



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A stellar career adds another star

James Graver, an Aerospace Quality Specialist at White Sands Test Facility, has been awarded three NASA Group Achievement Awards, two commendations and three achievement awards, and his name was flown to the Moon by Apollo 11 astronauts.

Recently, the Washington International Group contractor added another prestigious honor to his list. Graver was presented NASA's Mission Accomplished Xtraordinaire (MAX) award and the Star award from the Space Shuttle Program.

NASA bestows the MAX award upon Safety, Reliability and Quality Assurance (SR&QA) professionals who have made significant contributions leading to the success of a recent human spaceflight mission. Johnson Space Center Director Lt. Gen. Jefferson D. Howell, Jr., and Deputy Director Randy Stone select and award this honor to only one individual per mission.

The Space Shuttle Program Office presents the Star awards to individuals who have exhibited initiative and dedication in ensuring successful spaceflight. Recognizable performance is not restricted to crew safety and shuttle operations, but also includes payload activity, extravehicular activity and International Space Station assembly.

So what did Graver do that landed him the awards?

When asked, the soft-spoken Graver said, "I'm just trying to do my job." But in the course of doing his job, he spotted and helped correct a major problem with an Orbital Maneuvering Subsystem (OMS) engine.

"I noticed a problem during routine reassembly of the engine," Graver said. "Bolts in the propellant feedline flanges at several locations on the engine were being tightened but, during the final torque sequence, a bolt snapped off."

"That was alarming by itself," he said. "But when a second bolt was inserted and it too broke when being tightened, it immediately sent up a red flag."

Graver halted the assembly process to make sure that proper documentation of the anomaly was initiated. He then reported the problem to Debra Chowning, a WSTF Quality Engineer.

"Jim's confidence in his awareness of the system and the problem was invaluable in looking at inspection from an independent perspective," Chowning said. "Although there was a shuttle ready to fly within two weeks (STS-110), we knew that the problem had to be fixed. Even if the launch date was impacted, we felt that the shuttle would be safer and more reliable afterwards. The NASA Problem Action Center agreed with us."

An intensive investigation revealed the cause of the anomaly that Graver had spotted. It turned out that, during a redesign of the propellant-joint seals a few years ago, a new high-strength precision bolt was tightened to a higher torque value than the old ones. Then, an assembly-drawing mix-up caused the wrong bolts to be assigned the wrong torque values. The bolts became over-stressed and, as Graver witnessed, snapped off.

Meanwhile, Space Shuttle *Atlantis* was being prepared for STS-110. An exhaustive search of engine assembly documentation and physical inspection of the shuttle's engines found that the incorrect bolts were indeed installed in both engines of the shuttle. A team of engineers and technicians at WSTF developed and demonstrated a technique for sequentially replacing the discrepant bolts without compromising the integrity of the seal. This meant the bolts could be replaced without removing the engines or conducting high-pressure leak checks. Such procedures would have meant a significant delay in the mission.

Technicians at KSC were then able to replace *Atlantis*' bolts right on the launch pad, and the engines were cleared for flight. All other OMS engines throughout the shuttle fleet, including spares, were also inspected. Assembly drawings were updated to ensure that a similar problem did not occur again.

"You just can't top the experienced worker," said Raul Estrada, a Honeywell Test Cell Technician in the WSTF Propulsion Department. "I respect Jim very much."

Graver takes the recognition in stride. However, his stellar 40-year career speaks volumes. He began in 1962 with Grumman Aerospace in New York. Graver worked on the Apollo Lunar Module and several military aircraft programs – including the Navy A-6 Intruder, F-14 Tomcat and E-2C Hawkeye, as well as the Army OV-1 Mohawk – before he arrived at WSTF in 1975. His first job at the test facility was with the Propulsion Test Department.

Graver worked on the Shuttle OMS Engine and Forward Reaction Control Subsystem. He also worked in the Space Shuttle Depot for maintaining and repairing Primary/Vernier Reaction Control Subsystem Thrusters. This varied experience created a wealth of knowledge to apply to his current responsibilities.

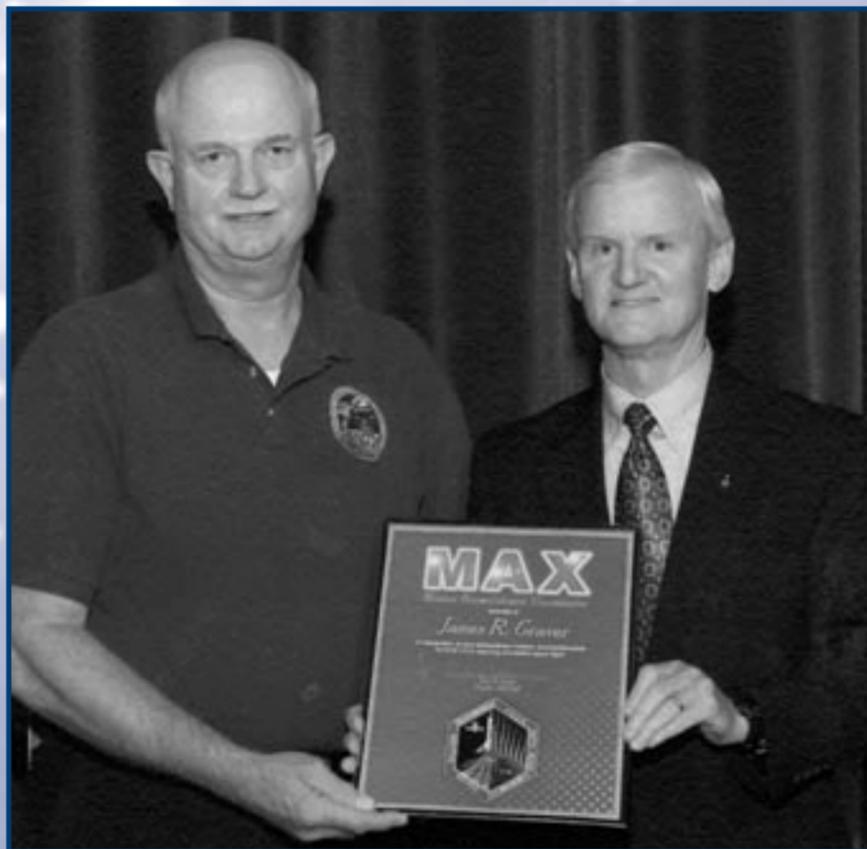
When Graver isn't taking care of rocket engines on the space shuttle, he spends time with his wife Mary Ann, three daughters and six grandchildren.

"Jim's extensive aerospace experience gives him the outstanding ability to identify problems in critical items, processes and tests by asking the right questions when something doesn't seem right to him," said Richard Cummings, JSC/Washington Group International Manager.

Joseph Fries, NASA WSTF Manager, said, "Jim is an outstanding employee who is being recognized for his contributions to the Space Shuttle Program. I am proud of the work that he has done over the years."

Graver believes the key to his success has been simply sticking to the basics. "It takes a lot of dedication to really learn a job," he said. "Concentrate on your job and be the best at what you do. Take the opportunity to learn and, when you learn something

new, share it with your coworkers. I enjoy passing on my knowledge to them." ♦



NASA JSC 2002e 48096

James Graver, left, accepts his Mission Accomplished Xtraordinaire (MAX) award from John Casper, former Director of Safety, Reliability & Quality Assurance.