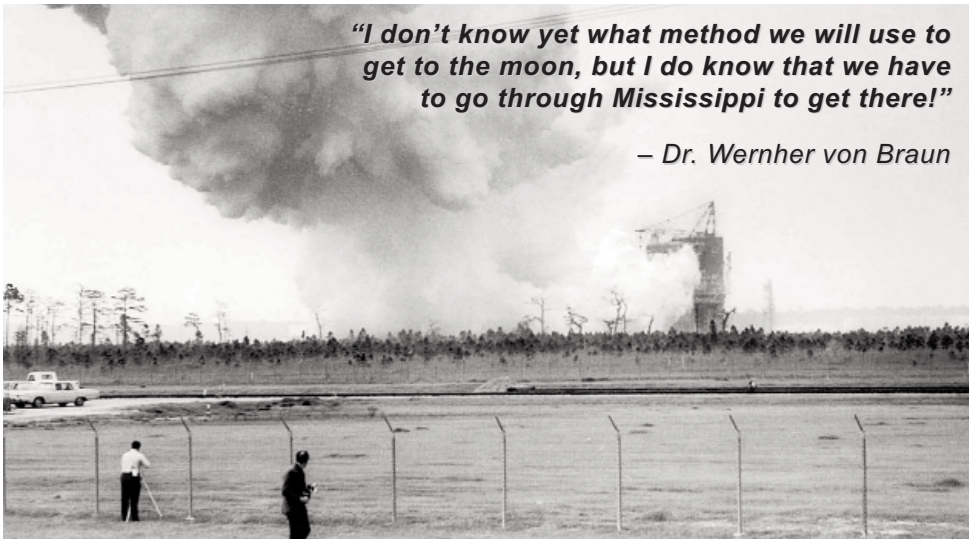
The History of the
John C. Stennis Space Center

The site known today as NASA's John C. Stennis Space Center has a rich history in space exploration. Called Mississippi Test Operations until 1965, the site was established to test the engines for America's first journeys to the moon aboard the Apollo Program's spacecraft. The facility was renamed in 1988 for Mississippi Sen. John C. Stennis, who championed its construction in his home state. Now the nation's largest rocket engine testing facility, Stennis Space Center tests all the main engines for the space shuttle and will test the engines for NASA's Constellation Program, the nation's plan to send humans back to the moon and possibly beyond.

The first static test-fire of the Apollo Program's S-II-T engine conducted on the A-2 Test Stand at NASA's Mississippi Test Facility (now Stennis Space Center) on April 23, 1966, marked the start of the Space Age in South Mississippi. The roar of the 1-million-pound-thrust booster stage took place only three years after construction began at the site.



"I don't know yet what method we will use to get to the moon, but I do know that we have to go through Mississippi to get there!"

– Dr. Wernher von Braun

When President John F. Kennedy made his historic 1961 announcement that the United States would put humans on the moon by the end of the decade, a place was needed to test the engines that would propel them on their journey.

The Beginning

Hancock County, Miss., provided the five things necessary to test the large rocket engines for the Apollo Program: a site isolated from large population centers, water and road access, public utility availability, nearby supporting communities and a climate conducive for year-round testing. In May 1963, workers felled the first tree, beginning the largest construction project in the state of Mississippi and the second largest in the United States at the time.

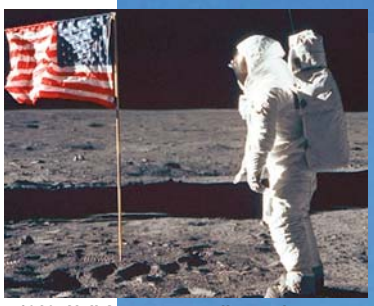
During the summer of 1965, there were 6,100 workers on site, employed by 30 prime and 250 subprime contractors, all involved in construction of the test stands for the Apollo Program's Saturn V rocket engines. The massive, 200-foot-tall steel and concrete structures were built to withstand thrust loads of more than 1 million pounds and temperatures up to 6,000 degrees Fahrenheit, and are still in use today. A seven-and-one-half-mile canal system connected the test stands to the Pearl River for transporting the large Apollo stages from the Michoud Assembly Facility in New Orleans and on to Kennedy Space Center in Florida. In just three years after the start of construction, the Saturn V rocket was test-fired on the A-2 Test Stand, and south Mississippi was blasted into the Space Age.

1964: Construction on A-2 Test Stand begins

1964: Workers lay A-2 Test Stand base

1965: Rocket engine test site emerges

1965: A-2 Test Stand takes shape



1969: Neil Armstrong walks on the moon

1969: Test-firing an S-II booster

1966: Workers prepare J-2 engines for testing

1966: Barges transport giant booster stages

1969: Apollo 11 mission launches

Apollo

From 1967 until 1972, Stennis test-fired all first and second stages of the Saturn V rocket for the Apollo Program. Nearby Michoud Assembly Facility in New Orleans manufactured Apollo's large rocket stages. Stennis' location on the Pearl River allowed the stages to be barged from Michoud to Stennis for testing, then across the Gulf of Mexico to Kennedy Space Center, Fla., where they were prepared for launch.

In spite of a short deadline and construction obstacles, 6,100 workers and major contractor General Electric were able to have the Mississippi facility ready in time for its first test-firing of a rocket engine on April 23, 1966 – a feat called "vital" to the Apollo Program. Stennis conducted 42 tests for the Apollo Program.

The Apollo Program had three unmanned and 12 manned missions with six actual lunar landings. Twelve astronauts walked on the moon. The first lunar footprints were those of Apollo 11 astronauts Neil Armstrong and Buzz Aldrin on July 20, 1969. They were all safely transported 240,250 miles to the moon by engines proven flightworthy at Stennis Space Center.

Milestones

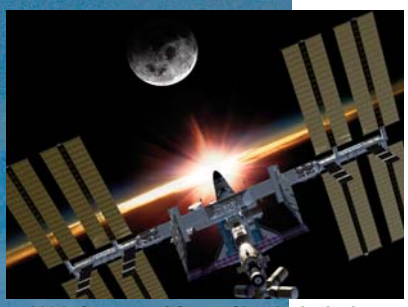
- ***Oct. 11-12, 1968:*** *Apollo 7, first manned mission*
- ***Dec. 21, 1968:*** *Apollo 8, first mission to orbit the moon*
- ***July 16-24, 1969:*** *Apollo 11, first humans walk on the moon*
- ***April 11-17, 1970:*** *Apollo 13, mission aborted after oxygen tank rupture. Crew was rescued, including astronaut Fred Haise of Biloxi, Miss.*
- ***Dec. 11, 1972:*** *Apollo 17, last lunar landing*

1967: First test-firing of a Saturn V booster stage, a cluster of five F-1 rocket engines

1995: Testing engine rotation

2006: 40th anniversary of engine testing

2004: Return to Flight engine ships out



2004: Concept of Space Shuttle docked to the International Space Station

Space Shuttle

After Apollo, NASA announced it would create the world's first reusable spacecraft, the space shuttle. Stennis Space Center converted its test stands to test the new vehicle's main engines. On May 19, 1975, Stennis and prime contractor General Electric tested the first space shuttle main engine on the A-1 Test Stand. Today, Stennis' more than 5,000 employees, including those of major contractor Pratt & Whitney Rocketdyne, continue to test every engine used to power the shuttle into orbit.

The space shuttle became the first spacecraft able to carry large satellites into orbit and retrieve them. It can orbit Earth at altitudes as high as 330 miles on missions of seven to 16 days, carrying a crew of up to seven. Scientific experiments are conducted in the gravity-free environment. Studies conducted in the shuttle's weightless environment enable research not possible on Earth.

On April 24, 1990, the space shuttle transported and launched the Hubble Telescope into space, expanding our understanding of the universe. Beginning in 1998, the shuttle began transporting the components to build the International Space Station, a permanent, inhabited, scientific laboratory in orbit 250 miles above Earth, with astronauts living on board for an average of three to six months.

Stennis also conducted extensive testing to return the space shuttle to safe flight after the losses of space shuttles Challenger in 1986 and Columbia in 2003.

Milestones

- ***May 19, 1975:*** *First space shuttle main engine test at Stennis*
- ***April 12-14, 1981:*** *First space shuttle launch*
- ***Jan. 21, 2004:*** *1 million seconds of space shuttle main engine testing and launch firings*
- ***Aug. 11, 2005:*** *30 years of space shuttle main engine testing at Stennis*
- ***Sept. 29, 2006:*** *A-1 Test Stand conducts its last space shuttle main engine test before conversion for testing engines for future spacecraft*

2004: Test of a space shuttle main engine for NASA's Return to Flight after loss of space shuttle Columbia

1981: First space shuttle mission

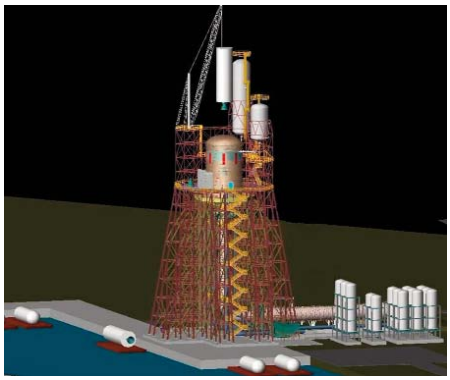
Construction begins in 2007 on the A-3 Test Stand (concept shown below), the first new large test stand at Stennis Space Center since the 1960s.

Constellation

In January 2004, President George W. Bush announced America's goal to return humans to the moon with eventual journeys to Mars. A new spacecraft would be developed to replace the space shuttle, and Stennis Space Center was chosen to test the engines that will power those next-generation spacecraft: Ares I crew launch vehicle and Ares V cargo launch vehicle.

Pratt & Whitney Rocketdyne's RS-68 engine was chosen to power the Ares V core stage. The RS-68 engine has been tested at Stennis since 1999.

In May 2007, NASA announced construction of a new test stand at Stennis to test the new J-2X engine's performance at simulated high altitudes. Clearing at the A-3 Test Stand's 19-acre site began in June 2007, and construction is due to be completed in late 2010, with engine test-firings soon afterward.



A-3 Test Stand

- 300 feet tall
- Open steel frame structure
- 19-acre site
- Thrust levels up to 1 million pounds
- Simulate altitudes up to 100,000 feet by generating steam to create a vacuum

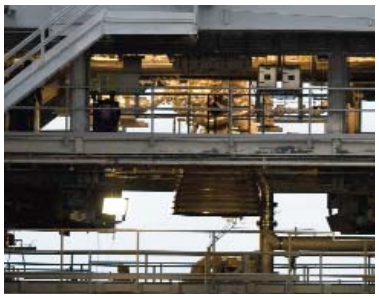
"Stennis Space Center is the last place in the country where we can test large engines or whole rocket stages. Without Stennis, NASA doesn't have a place to do that."

Michael Griffin
NASA Administrator

For information on NASA's 50 years of exploration, visit: http://www.nasa.gov/50th/home/

2007: J-2X engine

2007: J-2X installed for tests



2007: First test on J-2X Powerpack 1A

2008: Ares I, Ares V design concepts