Notable Numbers

NASA Stennis and Space Shuttle Main Engine Testing

No. 0001

Space shuttle main engine No. 0001 was the first to be tested at NASA Stennis. It was fired **67 TIMES** on the Fred Haise Test Stand (formerly A-1) at NASA Stennis for a cumulative 403 seconds.

18

Prior to the inaugural STS-1 shuttle mission, NASA Stennis teams conducted Main Propulsion Test Article testing to verify the vehicle's **THREE-ENGINE CONFIGURATION**. The article was fired 18 times from 1978 to 1981 on the B-2 side of the Thad Cochran Test Stand.

58

Initial testing at NASA Stennis focused on establishing proper engine start sequences. It took 37 hot fires using 13 different turbopumps to achieve 50% of rated power level. Another 58 tests were conducted before teams reached **100% RATED** power level.

73.9%

Almost **THREE-FOURTHS** – 73.9% – of all space shuttle main engine firings (including tests at other sites and shuttle launches) occurred at NASA Stennis.

100+

Following an initial test on May 19, 1975, NASA Stennis conducted 26 more hot fires by the end of the year. In the next **FIVE YEARS** (1976-1980), the center averaged more than 100 tests each year.

109%

During the Space Shuttle Program, engineers incorporated – and tested – **147 CHANGES** to increase main engine performance levels from 100% baseline power to 109% power level.

254

NASA Stennis teams conducted 2,344 tests of space shuttle main engines from 1975 to 2009. Of those, 254 (almost 11%) were hot fires of **SHUTTLE FLIGHT ENGINES**.

500

NASA follows a "test like you fly" approach, which means shuttle main engines were tested at NASA Stennis at full duration – **500 SECONDS** – the amount of time they must operate in flight.

2005/2006/2007

Three space shuttle main engines tested at NASA Stennis – No. 2005, No. 2006, and No. 2007 – helped power the **FIRST SPACE SHUTTLE MISSION** in 1981.

2,344

The American Institute of Aeronautics and Astronautics reports a breakdown of **ALL SHUTTLE MAIN ENGINE FIRINGS** – 36 launch pad firings at NASA's Kennedy Space Center in Florida, 66 tests at NASA's Marshall Space Flight Center in Alabama, 320 tests at Santa Susanna Field Laboratory in California, 405 launch firings, and 2,344 tests at NASA Stennis in Mississippi.

6,000

Space shuttle main engine exhaust reaches temperatures as high as 6,000 degrees Fahrenheit. To prevent damage to the engine and stand, operators flow more than **200,000 GALLONS** of pressurized water a minute into the stand flame deflector to cool the exhaust.

10,803.94

NASA Stennis teams conducted 18 tests of the three-engine Main Propulsion Test Article space shuttle configuration, representing **54 ENGINE STARTS** for 10,803.94 seconds of total engine hot fire.

512,000

The original power of the space shuttle main engine was almost 470,000 pounds of thrust. By 2009, the **POWER LEVEL** had been increased to more than 512,000 pounds at altitude.

820,475

In 34 years, space shuttle main engines totaled 1,095,677 seconds of cumulative **TESTING AND FLIGHT OPERATIONS** hot fire. NASA Stennis teams accounted for 820,475 seconds of that total.

The unmatched reliability and durability of the space shuttle main engine serves as an enormous credit to the NASA-contractor teams that have manufactured and tested the engines.

Ronnie Rigney, former NASA Stennis space shuttle main engine project manager, 2005

What we do determines if their (NASA astronauts) mission succeeds. It all boils down to assuring their safety. It makes me proud to be part of the team that accomplishes that goal.

Don Albritton, former aerospace technician at NASA Stennis, 2005

One cannot overstate the role Stennis has played in our nation's space program for the last 34 years. Its workers have created an unparalleled legacy of engine testing excellence.

Gene Goldman, former NASA Stennis Space Center director, 2009