



SAILing

through space

The mission of this space shuttle is to remain on the ground so others can fly

By Kelly Melone

Inside a shuttle mock-up called orbital vehicle 95 at the Johnson Space Center in Houston, engineer Doug Huntsman and his Boeing teammates are testing space shuttle mission software for something called a “transoceanic abort landing.”

On this day, they will run different scenarios consisting of various ascent, entries and aborts.

No space shuttle has ever had to make an aborted landing after launch, but OV-95 is the place to practice one.

Since the shuttle’s flight software is checked and verified for its final time in OV-95, there is no other place to catch errors or deficiencies before launch. “We’re the shuttle’s last line of defense,” Huntsman said.

Unlike NASA’s other shuttles, such as *Endeavour* (OV-105), *Atlantis* (OV-104) and *Discovery* (OV-103), OV-95 can’t leave the ground. But it has made all those other shuttle missions possible.

Known as the Shuttle Avionics Integration Laboratory, or SAIL, OV-95 is essentially a shuttle in a lab. It doesn’t have wings or a tail. There is no landing gear. What it does have is a state-of-the-art glass cockpit, middeck and payload bay without the clamshell doors of an actual shuttle.

It is configured, and wired, nearly identically as a shuttle that carries astronauts into space.

The lab is a comprehensive test bed in which the software, hardware, flight procedures, ground support—and the people—are brought together.

“We test before we fly and test like we fly,” explained Don Magnusson, the SAIL test operations and maintenance manager for United Space Alliance, the joint venture by Boeing and Lockheed Martin and the lab’s operator. “And then we fly like we test.”

A typical shuttle mission costs more than \$1 billion. So the software better work.

Chad Smith is one of the newest members of Boeing’s SAIL team and works in Entry Guidance, Navigation and Control.

“We start with the black and white. We look at the actual code that’s being added into the software,” Smith said. The Boeing team puts the updated software through its paces “reconfiguring switches, providing crew keyboard inputs, monitoring changes and making sure things happen in the right sequence.” Then, after every test, they conduct a full analysis and submit their reports—wrapping up 63 days before a shuttle flight.

The shuttle program is nearing the end, and that fact is not lost on Smith, Huntsman and the other team members. But as long as there are shuttle missions, they have work to do. ■

PHOTO: Boeing SAIL team members Doug Huntsman (left) and Ariel Rodriguez check switch configurations on the OV-95 flight deck. ELIZABETH MORRELL/BOEING

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