

Huge endeavor to move space shuttle tank

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The tugboat Miss Gloria pulls a barge with the space shuttle external fuel tank dubbed ET-94. The rust-colored behemoth tank, the last of its kind, left its longtime home at NASA's Michoud Assembly Facility in New Orleans, Louisiana, on April 12, 2016. Photo: Francine Orr/Los Angeles Times/TNS

NEW ORLEANS, La. — The 15-story outer tank known as ET-94 was meant to latch onto a space shuttle, thrust it into outer space and then separate and burn up in a blaze of glory.

But tragedy altered its destiny. ET-94 remained solidly on Earth. It narrowly survived Hurricane Katrina in Louisiana and is now the last of a fleet of its kind.

On Tuesday, it began a decidedly different journey, by sea, from New Orleans, Louisiana, to its new home in Los Angeles, California.

For the next five weeks, ET-94 will be strapped to an ocean barge. It will cross through the Panama Canal, ride up the Pacific Coast and dock in Los Angeles' Marina del Rey in mid-May. Then, like the space shuttle Endeavour, ET-94 will ride through Los Angeles streets before arriving at the California Science Center. There, it will go on permanent display with the Endeavour.

So Long, Big Guy

On Tuesday, National Aeronautics and Space Administration (NASA) employees — standing in NASA's huge factory where the outer tanks were built during the 30-year shuttle program — saluted ET-94 as a hero, going off to inspire future generations.

“It’s a little like watching my baby leave the nest after all these years,” said Patrick Whipps, a NASA engineer who oversaw the building of the tanks. “It’s my baby. It always will be. I’d love to come visit it someday.”

The 66,000-pound cylindrical orange tank was completed in 2001 and could hold 1.6 million pounds of liquid hydrogen and liquid oxygen. After liftoff, the tanks separated about 70 miles above the Earth’s surface and burned up in the atmosphere. Each launch required a new one.

ET-94 was the sister to the space shuttle Columbia’s outer tank, ET-93. The Columbia burned up on re-entry in 2003, killing the seven astronauts on board. The mission failed when a piece of foam the size of a suitcase broke off the outer tank during launch, causing fatal damage to the shuttle.

Tank Probed For Clues

Scientists and investigators turned to ET-94 to see what went wrong and how to make future flights safer. Large pieces of its insulating foam were looked at to understand how it worked. Scientists also used it to test new ways of applying foam.

“I’ll always see, when I look at ET-94 ... that it’s a critical team member, that it made a difference,” said Jody Singer, a deputy director at NASA. “When you think about it, it’s really appropriate for ET-94 to be the one that’s on center stage now. It’s time for it to have its day and be displayed.”

In 2005, ET-94 was one of about a dozen outer tanks to survive Hurricane Katrina in New Orleans. As other employees left, a small crew stayed at the manufacturing facility during the storm. For weeks afterward, they manned pumps and generators to keep it running while everything around it was under water. Many of them lost their homes while they worked.

“If you didn’t save the tanks, then you’d lose the shuttle program,” Malcolm Wood, one of the workers who stayed behind, said. “If you lost the program, then you had about 3,000 people who were going to lose their jobs.”

Too Old To Serve Space Program

Another tank was damaged when part of a roof collapsed. It was later repaired and flew with Endeavour. ET-94 was unharmed, but by then it was considered too old to go into space.

NASA agreed last year to donate ET-94 to the California Science Center. For months, dozens of scientists, engineers, utility workers and Southern California police officers planned every detail of its move.

On Tuesday, ET-94 pushed away from the factory dock during a small break in the storm that threatened to delay its journey. A tugboat started pulling it through the waterways toward open water in the Gulf of Mexico, as planned.

But there was a complication: It was windy.

At about 9 p.m. Monday, with winds expected to be more than 20 miles per hour (mph), the company directing the move, Emmert International, decided to add a second river tugboat directly to the back of the barge to carefully guide its steering from behind.

Huge Challenge

“The main thing right now is we’ve got to see how the barge is going to react with winds blowing; it’s going to want to push to the side,” said Terry Emmert, vice president of the company, standing at the edge of the dock. “The canal’s going to be a lot more challenging than we thought.”

The tank-laden barge reached open water outside Gulfport, Mississippi, early Wednesday. There, the river tugboats were replaced by a 96-foot ocean tugboat called the Shannon Dann. A long stretch of braided steel cable will separate the boat and barge to absorb shock from the waves.

The barge will travel for seven to nine days, around the clock, at about 6 knots (about 7 mph). At the Panama Canal, it will wait a day or two in a queue before passing through. It will travel for 17 to 20 days to San Diego, California, where it will clear customs before its expected arrival at Fisherman’s Village in Marina del Rey on May 18, according to the Science Center.

Quiz

- 1 Which statement would be BEST to include in a summary of the article?
- (A) The shuttle program that developed the ET-94 lasted several decades, and is now ending.
 - (B) The outdated ET-94 is the last tank of its kind and will be moved to an exhibit in California.
 - (C) The engineers that developed the ET-94 and the other tanks in its fleet are sad to see it go.
 - (D) It will be more difficult than expected for the ET-94 to pass through the Panama Canal.
- 2 Which two of the following sentences from the article include central ideas?
1. *On Tuesday, [ET-94] began a decidedly different journey, by sea, from New Orleans, Louisiana, to its new home in Los Angeles, California.*
 2. *The 66,000-pound cylindrical orange tank was completed in 2001 and could hold 1.6 million pounds of liquid hydrogen and liquid oxygen.*
 3. *Scientists and investigators turned to ET-94 to see what went wrong and how to make future flights safer [after the Columbia shuttle disaster].*
 4. *“If you didn’t save the tanks, then you’d lose the shuttle program,” Malcolm Wood, one of the workers who stayed behind [during Katrina], said.*
- (A) 1 and 3
 - (B) 1 and 4
 - (C) 2 and 3
 - (D) 2 and 4
- 3 What is the MOST important reason why Malcolm Wood chose to stay behind with the tanks during Hurricane Katrina?
- (A) He wanted to continue doing important research.
 - (B) He wanted to prevent workers from losing their jobs.
 - (C) He wanted to preserve an important piece of history.
 - (D) He wanted to avoid getting caught in the hurricane.

- 4 Why is ET-94 an important piece of NASA history?
- (A) It is the largest tank to be transported by boat.
 - (B) It will be the only tank on display to the public.
 - (C) It helped scientists develop safer fuel tanks.
 - (D) It is the tank that caused the Columbia disaster.