National Aeronautics and Space Administration

NASAfacts

NASA's Barge Pegasus – Transportation for the Space Launch System Core Stage

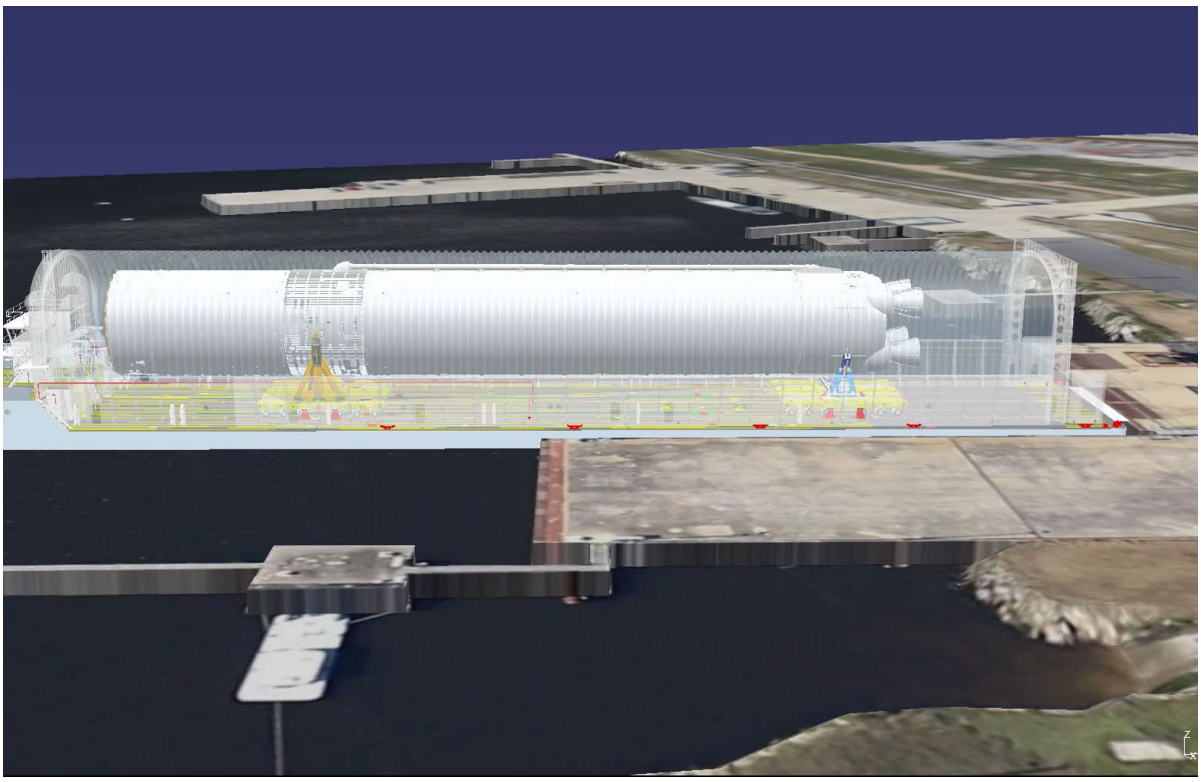
NASA's barge, Pegasus, will be used to ferry the massive core stage of the agency's new rocket, the Space Launch System, on journeys from the Michoud Assembly Facility in New Orleans to other NASA centers for testing and for launches.

SLS will be the most powerful rocket ever built for deep space missions, including to an asteroid and ultimately to Mars.

The 213-foot-tall, 27.6-foot-diameter core stage includes the cryogenic liquid hydrogen and liquid oxygen tanks that will feed four RS-25 rocket engines, and also contains the vehicle's avionics and flight computer. The SLS core stage will be the longest item ever shipped by a NASA barge.

NASA has for decades used barges to move its large spaceflight structures. Pegasus was specially designed and built in 1999 to transport the giant external tanks of the space shuttles from the Louisiana shore to NASA's Kennedy Space Center on the eastern coast of Florida – a 900-mile journey that includes both inland and open-ocean waterways. Pegasus replaced Poseidon and Orion, barges that were used to carry Saturn rocket stages and hardware for the Apollo Program.

Pegasus completed its final space shuttle-related voyage in 2011 and has since been housed at NASA's Stennis Space Center near Bay St. Louis, Mississippi. Because the SLS core stage is more than 50 feet taller than the space shuttle external tank and, including ground support and transportation equipment, more than 600,000 pounds heavier, Pegasus had to be modified and refurbished for its new mission. In 2014, crews at Conrad Shipyard LLC in Morgan City, Louisiana, were given the task. A 115-foot section of the barge was removed and replaced with a 165-foot section specially designed to increase the cargo weight Pegasus can accommodate and lengthening it from 260 feet to 310 feet – longer than a football field.



Artist concept of SLS core stage on the Pegasus barge.

The Army Corps of Engineers Marine Design Center in Philadelphia, utilizing the engineering expertise of Bristol Harbor Group of Bristol, Rhode Island, performed the naval architecture and marine engineering design, as well as management of the Conrad contract. The modifications were completed in 2015.

The first voyages for the refurbished Pegasus are planned for mid to 2016, to carry core stage structural test articles from Michoud to NASA's Marshall Space Flight Center in Huntsville, Alabama – a trip of from seven to 10 days. At Marshall, the elements of the core stage will undergo structural loads testing. These tests are performed to ensure each piece of hardware can endure launch loads without any adverse effects to the vehicle, or most importantly, to the crew.

Pegasus is expected to ferry the flight-ready core stage to Stennis for testing in the fall of 2017, and then to Kennedy in early 2018 for integration into the SLS flight vehicle in the Vehicle Assembly Building. Trips from Michoud to Stennis will take approximately one day; the trips from Stennis to Kennedy will take approximately six days.

NASA's Marshall Space Flight Center manages the SLS program for the agency. Marshall Center Operations Transportation and Logistics Engineering Office manages, operates and maintains Pegasus and NASA's barge transportation program.

SLS's first flight test, called Exploration Mission 1, will feature a Block I configuration for a 77-ton (70-metric-ton) lift capacity and carry an uncrewed Orion crew capsule beyond the moon.

Pegasus Barge Facts

Length: 310 feet (94.4 meters)

Width: 50 feet (15.24 meters)

Usable cargo deck length: 240 feet (73.15 meters)

Usable cargo deck width: 36 feet (10.97 meters)

Usable cargo deck height: 41 feet (12.49 meters)

On-Board Power: Three 200 kilowatt generators

Engines: None. Tugboats or towing vessels are required to move the barge.

The next planned evolution of the SLS, Block 1B, would use a more powerful exploration upper stage to enable more ambitious missions and a 105-metric-ton lift capacity.

A later evolution, Block 2, would add a pair of advanced solid or liquid propellant boosters, to provide a 130-metric-ton (143-ton) lift capacity.

In each configuration, SLS will continue to use the same core stage with four RS-25 engines, which will be transported by the Pegasus.

For more information about SLS, visit:

http://www.nasa.gov/sls/

http://www.twitter.com/NASA_SLS

http://www.facebook.com/NASASLS

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