NASAfacts

Vehicle Assembly Building

The Vehicle Assembly Building, or VAB, is a national landmark that remains a central element of NASA's plans to launch people and equipment deep into space on missions of exploration. Built at NASA's Kennedy Space Center in Florida, it remains the only building to assemble a rocket that carried humans to the surface of another world. For 30 years it served as the final assembly point for a space shuttle as the orbiter was attached to an external fuel tank and solid rocket boosters for launch.

The structure was completed in 1965 for the assembly of the Apollo/Saturn V moon rocket, the largest rocket made by humans. The building was constructed 3.5 miles from Launch Pad 39A and 4.2 miles from Launch Pad 39B. A pair of crawler-transporters, some of the largest machines ever to move on land, were used to carry the completed rockets to the pad.

Its role as a central hub for NASA's premiere spaceport remains secure as plans move ahead to outfit the building to host several different kinds of rockets and spacecraft at the same time. Whether those craft are going into Earth orbit or being sent into deep space, the VAB will have the infrastructure to prepare them correctly for their missions.

The craft include NASA's Space Launch System, or SLS, a rocket and spacecraft similar to the Apollo/Saturn V the VAB was originally built to support. The SLS will use many technologies derived from the space shuttle, however, and will be larger than the 1960s-era Saturn V. The Orion spacecraft that will top the rocket is also larger than its Apollo ancestor.

The Ground Systems Development and Operations Program is leading an extensive refurbishment of one of space exploration's unique facilities. The modernization calls for a flexible setting inside the VAB

NASA's Vehicle Assembly Building, or VAB, at Kennedy Space Center in Florida was used to assemble and house American-crewed launch vehicles from 1968 to 2011. At 3,664,883 cubic meters, it is one of the largest buildings in the world by volume.

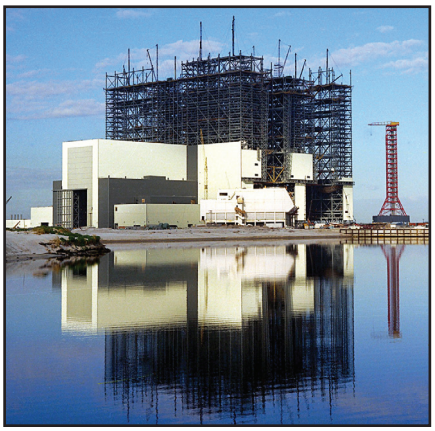
rather than configuring the whole building toward supporting one design.

Part of the effort includes removing about 50 miles of Apollo/shuttle-era cabling from high bays 1 and 3 to make room for installation of future state-of-the-art command, communication, and control systems that will be needed by future users to perform vehicle testing and verification prior to rollout to the launch pad.

Future work also will replace the antiquated communications, power and vehicle access resources with modern, efficient systems. Some of the utilities and systems slated for replacement have been used since the VAB opened in 1965.

One of the largest buildings in the world by area, the VAB covers eight acres, is 525 feet tall and 518 feet wide. It is made up of 65,000 cubic yards of concrete and its frame is constructed from 98,590 tons of steel. It stands atop a support base of 4,225 steel pilings driven 164 feet into bedrock.

The building also is home to the largest American flag, a 209-foot-tall, 110-foot-wide star spangled banner painted on the side of the VAB. A 12,300-square-foot NASA logo also adorns the side of the massive facility. The flag and logo were repainted as part of the refurbishment on the building.



NASA's Vehicle Assembly Building under construction with the Launch Control Center and service towers as seen from across the turn basin Jan. 5, 1965.

The tallest portion of the VAB is called the high bay. It encloses four vertical corridors, each with a door 456 feet high. The doors are the largest in the world and take about 45 minutes to completely open or close.

The lower structure has large areas of its own that are used to store rocket components until they are needed. A transfer aisle down the center of the VAB connects the bays, allowing massive components and equipment to be rolled into the building, lifted and assembled on a specialized platform that is taken to the launch pad.

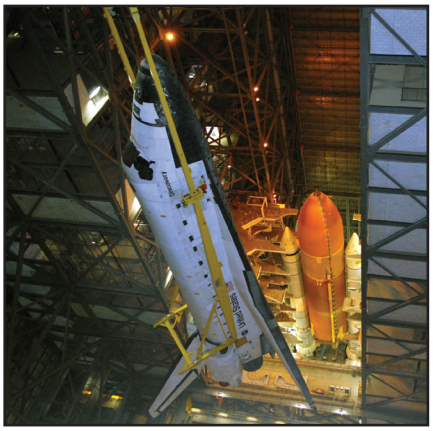
There are five overhead cranes inside the VAB, including two that can hold 325 tons. These are critical to picking up the heaviest elements of rockets and placing them carefully into position ahead of launch. Often operated from cabs near the VAB's ceiling, the cranes are precise enough to lower an object onto an egg without cracking it.

Combining established capabilities with modern needs is the primary goal as the world's most famous landmark of space exploration is refitted for 21st century work.

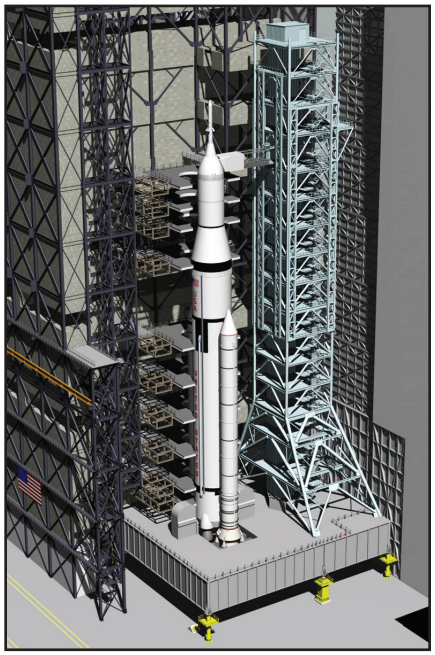
MORE ONLINE

For more information on the Ground Systems Development and Operations Program, go to **http://go.nasa.gov/groundsystems**

A Saturn V rocket rolls out of NASA's Vehicle Assembly Building on the crawler-transporter Aug. 1, 1967, for the Apollo 4 mission as seen from across the turn basin.



Suspended in the Vehicle Assembly Building at NASA's Kennedy Space Center, space shuttle Discovery is lowered toward the solid rocket boosters and external fuel tank on March 29, 2005.



An artist's illustration shows how the interior of High Bay 3 in the Vehicle Assembly Building will look after modifications are made to host the Space Launch System, a rocket as large as the Saturn V.

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