

World's Largest Liquid Hydrogen Sphere

CB&I returned to Launch Complex 39B (LC-39B) at John F. Kennedy Space Center in Cape Canaveral, Florida to build the largest liquid hydrogen (LH2) sphere in the world. The existing LH2 sphere at LC-39B, built by CB&I in the 1960s, fueled the Apollo and Space Shuttle programs, including the first moon landing in 1969.

The Challenge

When NASA began developing the new Space Launch System for the Moon to Mars Exploration Program, studies indicated the current LH2 capacity at LC-39B was insufficient.

The Solution

NASA explored numerous solutions but ultimately contracted CB&I to design and build a new, larger sphere with the capacity to store 1,250,000 gallons of liquid hydrogen. The outer sphere measures 83 feet in diameter and is nearly 50 percent larger than the existing sphere built in the 1960s.

Technological Advancements

The new sphere will advance cryogenic insulation technology by incorporating glass bubble bulk fill insulation instead of perlite. NASA studies have shown that the glass bubble insulation should reduce the LH2 boil off by 40-50 percent.

A NASA-developed, first-of-a-kind internal Integrated Refrigeration and Storage (IRAS) heat exchanger will also be employed to cycle helium throughout the inner sphere to keep the hydrogen liquified and minimize boil-off.

The additional capacity of the new sphere will provide NASA with the combined site capabilities to store and process over two million usable gallons of liquid hydrogen for launch support.



Client:	Precision Mechanical, Inc.
Location:	Cape Canaveral, Florida
Services:	Design, Fabrication & Construction
Size:	1.25 Million Gallons
Schedule:	2022

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