

# America's next great ship: Space Launch System Core Stage

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*Transitioning from design to manufacturing*

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## **Abstract:**

The Space Launch System (SLS) Program is essential to achieving the Nation's and NASA's goal of human exploration and scientific investigation of the solar system. As a multi-element program with emphasis on safety, affordability, and sustainability, SLS is becoming America's next great ship of exploration. The SLS Core Stage includes avionics, main propulsion system, pressure vessels, thrust vector control, and structures. Boeing manufactures and assembles the SLS core stage at the Michoud Assembly Facility (MAF) in New Orleans, LA, a historical production center for Saturn V and the Space Shuttle programs.

As the transition from design to manufacturing progresses, the importance of a well-executed manufacturing, assembly, and operations (MA&O) plan is crucial to meeting performance objectives. Boeing employs classic techniques such as critical path analysis and facility requirements definition as well as innovative approaches such as Constraint Based Scheduling (CBS) and Critical Chain Project Management (CCPM) theory to provide a comprehensive suite of project management tools to manage the health of the baseline plan on both a macro (overall project) and micro level (factory areas). These tools coordinate data from multiple business systems and provide a robust network to support Material & Capacity Requirements Planning (MRP/CRP) and priorities. Coupled with these tools and a highly skilled workforce, Boeing is orchestrating the parallel buildup of five major sub assemblies throughout the factory.

Boeing and NASA are transforming MAF to host state of the art processes, equipment and tooling, the most prominent of which is the Vertical Assembly Center (VAC), the largest weld tool in the world. In concert, a global supply chain is delivering a range of structural elements and component parts necessary to enable an on-time delivery of the integrated Core Stage. SLS is on plan to launch humanity into the next phase of space exploration.