New report says SLS rocket managers concerned about fuel leaks

Enlarge / Technicians at NASA’s Michoud Assembly Facility in New Orleans moved the Space Launch System’s liquid hydrogen tank from the factory to the dock, where it was loaded onto the Pegasus barge on Dec. 14, 2018.

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Every year, the US Government Accountability Office releases a report that assesses NASA’s major projects. Typically, this GAO report summarizes each project and provides some basic information about schedule, cost, and concerns regarding the space agency’s work.

However, the new “Assessments of Major NASA Projects” report released on Wednesday contains what seems to be an entirely new bit of information about the Space Launch System rocket NASA is developing for deep space exploration. The report asserts that engineers at NASA and the SLS rocket’s core-stage contractor, Boeing, are concerned about fuel leaks.

Earlier this year, NASA moved the big rocket’s core stage to a test site at Stennis Space Center in southern Mississippi. Before the COVID-19 pandemic temporarily halted work, NASA and Boeing teams were working toward a critical summer exercise. During this “green run” test, the clamped-down rocket will ignite its engines and burn for about eight minutes to

simulate an ascent into orbit.

“Program officials indicated that one of the top remaining technical risks to the green run test is that the core stage may develop leaks when it is filled with fuel,” the report states on page 82. “According to these officials, they have conducted extensive scaled testing of the gaskets and seals used in the core stage; however, it is difficult to precisely predict how this large volume of liquid hydrogen will affect the stage.”

Launch slipping more?

The lead author of the new report, Cristina Chaplain, director of Contracting and National Security Acquisitions for the GAO, did not immediately respond to a request for more information about this issue. NASA has not publicly discussed these concerns.

Boeing, the prime contractor, began work on the SLS core stage nearly a decade ago, and NASA has invested about $10 billion into the program to develop this stage alone. The SLS core stage is very large, but at its essence, the vehicle represents fairly standard aerospace fare, with big liquid-hydrogen and liquid-oxygen fuel tanks and a plumbing system for four rocket engines. The engines for the SLS rocket are holdovers from the space shuttle program, and other contractors are working on the side-mounted boosters (Northrop Grumman) and upper stage (United Launch Alliance) for the first flight of the complete rocket.

Fuel leaks could have a significant effect on the SLS program’s schedule. “Should leaks or other issues be discovered, the program will need time to assess and mitigate difficulties or glitches, which could delay shipping the core stage to Kennedy Space Center and the enterprise integration and test schedule,” the report states.

NASA has yet to provide a new formal launch date for the SLS program. Originally intended to launch in 2017, the launch date has slipped several times until it is now expected to fly no earlier than the second half of 2021. However, due to the COVID-19 situation, further delays are likely, and any significant issues with fuel leaks would certainly set the launch date back further. It seems increasingly likely that the SLS rocket that will power the Artemis I mission for NASA will not be ready to go until 2022.

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