Audit calls NASA's goal to reduce Artemis rocket costs 'highly unrealistic,' threat to deep space exploration

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NASA's goal to reduce the costs of the powerful Space Launch System rocket for its Artemis program by 50% was called "highly unrealistic"

and a threat to its deep space exploration plans, according to a report by NASA's Office of the Inspector General released on Thursday.

The audit says the costs to produce one SLS rocket through its proposed fixed-cost contract will still top $2.5 billion, even though NASA thinks it can shrink that through "workforce reductions, manufacturing and contracting efficiencies, and expanding the SLS's user base."

"Given the enormous costs of the Artemis campaign, failure to achieve substantial savings will significantly hinder the sustainability of NASA's deep space human exploration efforts," the report warns.

Already, the Biden administration is requesting its largest NASA budget ever for the next fiscal year, although a Republican-led U.S. House is likely to kneecap some of NASA's requests.

The audit looked at NASA's plans to shift from its current setup among multiple suppliers for the hardware to a sole-sourced services contract that would include the production, systems integration and launch of at least five SLS flights beginning with Artemis V currently slated for as early as 2029.

NASA's claim it could get those costs to $1.25 billion per rocket was taken to task by the audit.

"NASA's aspirational goal to achieve a cost savings of 50% is highly unrealistic. Specifically, our review determined that cost saving initiatives in several SLS production contracts … were not significant," the audit reads.

It does find that rocket costs could approach $2 billion through the first 10 SLS rockets under the new contract, a reduction of 20%.

Artemis I used the SLS rocket that with 8.8 million pounds of thrust launched from Kennedy Space Center in November 2022 becoming the most powerful rocket to ever make it to orbit. It sent the Orion spacecraft on an uncrewed flight to orbit the moon.

Artemis II will fly with four astronauts on a short trip around the moon aiming for launch as early as November 2024 while a more complicated Artemis III mission hopes to return humans including the first woman to the lunar surface as early as December 2025. Artemis IV is on NASA's calendar for 2028 and is aimed at helping construct the Gateway lunar space station to support moon landing missions.

Through 2025, the audit stated its Artemis missions will have topped $93 billion, which includes billions more than originally announced in 2012 as years of delays and cost increases plagued the leadup to Artemis I. The SLS rocket represents 26% of that cost to the tune of $23.8 billion.

Boeing is the primary contractor for the core stage working with Aerojet Rocketdyne for the core stage's four RS-25 engines while Northrop Grumman provides the two solid rocket boosters. Lockheed Martin is the prime contractor for Orion while United Launch Alliance and the European Space Agency also have a hand in the SLS and Orion programs.

The new contract called the Exploration Production and Operations Contract (EPOC) would award the SLS contract to a joint venture of Boeing and Northrop Grumman called Deep Space Transport, LLC. The contract would include an option for an additional five launches for a total of 10. It's targeting a larger version of SLS called Block 1B that will use a new Exploration Upper Stage that will increase the rocket's cargo capacity.

Before entering the new single-source contract, NASA also plans for a

three-year pre-EPOC contract that the audit commended so that NASA can continue direct oversight of the new combined company while also giving time for Boeing to improve its assembly line productions.

It also warns that some aspects of future Artemis launches could fall outside the fixed-cost contract, and noted there was a $4.3 billion increase in cost-reimbursable contracts leading up to the Artemis I launch.

The audit calls out NASA's grant to its current contractors of limited rights data into the rocket design, which precludes effective competition. Basically, no one other than Boing and Northrop Grumman can build an SLS rocket, and that means NASA's hands are tied when it comes to cost increases for heavy-lift launch services.

"That said, moving SLS production from separate cost-reimbursable contracts to a combined commercial services approach may potentially reduce SLS production costs in the long term if a fixed-price contract is used to codify a reduced price," the audit said.

One of the pitches by NASA to reduce costs is that Deep Space Transport will be able to produce rockets for other customers leading to savings through economies of scale. But to date, no other customers have come forward, and other heavy lift rockets such as SpaceX's Starship and Super Heavy or Blue Origin's New Glenn could offer NASA alternatives for its Artemis program plans.

"Although the SLS is the only launch vehicle currently available that meets Artemis mission needs, in the next 3 to 5 years other human-rated commercial alternatives that are lighter, cheaper, and reusable may become available," the audit reads. "Therefore, NASA may want to consider whether other commercial options should be a part of its mid- to long-term plans to support its ambitious space exploration goals."

NASA's goal for the Artemis program, set during the Obama administration, is still to land a human on Mars by 2040.

The audit put forth a litany of recommendations to help keep it approach its reduced Artemis cost goals, though. They include among other suggestions that before the fixed-cost EPOC is in place to establish "achievable cost saving metrics" starting with the Artemis IV SLS contracts and to transition core stage and Exploration Upper Stage contracts to a fixed price contract with a per mission price so NASA can figure out its actual costs.

It also suggests flexible contracts for future SLS acquisitions "that will allow NASA to pivot to other commercial alternatives."

"These commercial ventures will likely capitalize on multiple technological innovations," the audit reads. "Further driving down costs is the competition between aerospace companies such as SpaceX, ULA, and Blue Origin, with both SpaceX and Blue Origin currently developing reusable medium- and heavy-lift launch vehicles that will compete with NASA's SLS single-use rocket."