

**Agency Priority Goal | Action Plan | FY 2022 – Q4**

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# Artemis

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**Goal Leader(s):**

Goal Leader: Thomas Whitmeyer, Deputy Associate Administrator,  
Common Exploration Systems Development Division, Exploration Systems  
Development Mission Directorate (ESDMD)

Deputy Goal Leader: Mark Kirasich, Deputy Associate Administrator,  
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# Goal Overview

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## Goal statement

- Advance America's goal to land the first woman and the first person of color on the Moon and pursue a sustainable program of exploration by demonstrating capabilities that advance lunar exploration. By September 30, 2023, NASA will launch Artemis I, deliver the Core Stage for Artemis II to Kennedy Space Center for processing, and have multiple companies under contract to develop systems for sustainable human lunar exploration.

## Problem to Be Solved

- Successfully execute long-duration space exploration missions – to the Moon and then on towards Mars – while developing new commercial launch capabilities, launch vehicles, spacecraft, and a lunar lander.

## What Success Looks Like

- Launch Artemis I, the first integrated flight test of the Space Launch System (SLS) rocket and Orion spacecraft, with support from the upgraded Exploration Ground Systems at Kennedy Space Center (KSC)
- Deliver the SLS rocket Core Stage to KSC for processing in preparation for Artemis II, the first crewed Artemis mission
- Have multiple companies under contract to develop systems for sustainable human lunar exploration

## Goal target(s)

In the table below, please repeat the key metrics included in the goal statement (previous slide) that will be used to track progress.

**Please update this column each quarter.**

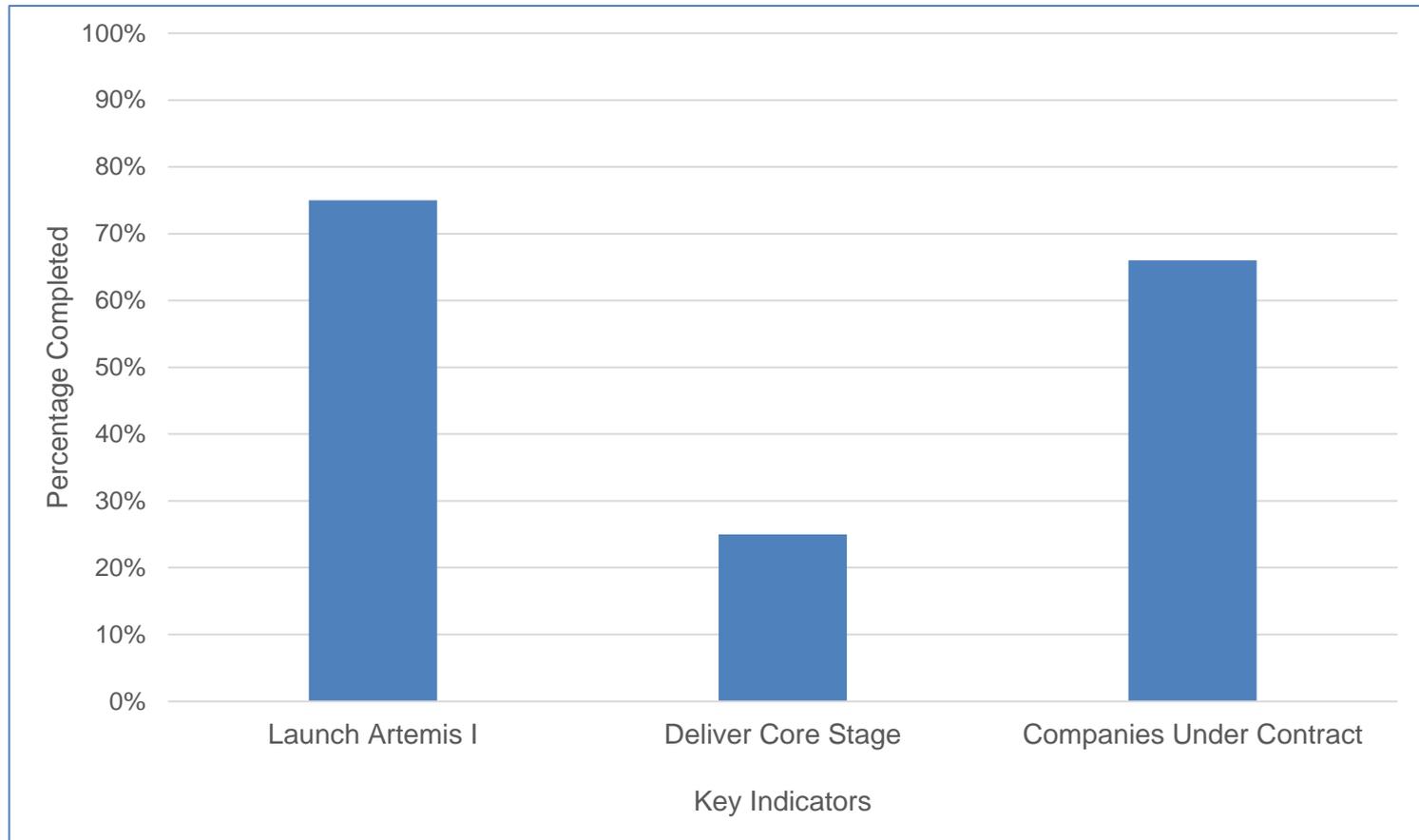
Achievement statement		Key indicator(s)	Quantify progress			Frequency
Repeat the achievement statement from the goal statement on the previous slide		A "key performance indicator" measures progress toward a goal target	These values enable us (and you!) to calculate % complete for <u>any</u> type of target*			When is there new data?
By...	We will...	Name of indicator	Target value	Starting value**	Current value	Update cycle
9/30/2023	Launch Artemis I <ul style="list-style-type: none"> <li>Completed Orion/SLS stacking</li> <li>Completed integrated Vehicle Interface verification tests</li> <li>Conducted communications end-to-end test</li> <li>Completed Countdown Sequence Test</li> <li>Completed preparation roll-out to Pad B</li> <li>Complete wet dress rehearsal</li> <li>Complete Termination System tests</li> <li>Complete roll-out to Pad B for launch</li> <li>Launch Artemis I</li> <li>Complete recovery operations</li> </ul>	Launch Artemis I	100%	0%	75% (based on a NET August 29 launch)	quarterly
9/30/2023	Deliver the SLS rocket Core Stage to KSC for processing in preparation for Artemis II <ul style="list-style-type: none"> <li>Completed assembly of upper Core Stage</li> <li>Complete full assembly</li> <li>Deliver by barge to KSC</li> <li>Transport from barge to VAB</li> </ul>	Deliver Core Stage	100%	0%	25%	quarterly
9/30/2023	Have multiple companies under contract to develop systems for sustainable human lunar exploration by announcing awards for sustaining lunar development <ul style="list-style-type: none"> <li>Completed the HLS Option A award</li> <li>Award contract(s) for xEVA</li> <li>Award contract(s) for sustaining lander development</li> </ul>	Companies Under Contract	100%	0%	66%	quarterly

*Italics* indicates that the task has been completed

# Key indicators

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## Progress as of FY 2022 Q4



# Goal Strategies

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- Common Exploration Systems Development will systematically progress through major qualification, testing, and production milestones to ensure the success of the Space Launch System (SLS) and Orion spacecraft on Artemis I (uncrewed test flight), Artemis II (crewed test flight), and Artemis III (crewed mission to the lunar surface)
- Artemis Campaign Development will use innovative procurement and management approaches to develop the core capabilities [Gateway, Human Landing System (HLS), and EVA & Human Surface Mobility] needed to conduct the lunar surface mission and enable multiple launch options for lunar missions.

# Key milestones

## Milestone Summary

Key Milestone	Milestone Due Date	Milestone Status	Comments
Complete the Artemis II Crew Module Adapter/ Service Module mate	FY 2022 Q1	Completed	Completed in October 2021.
Complete the Artemis II Interim Cryogenic Propulsion Stage	FY 2022 Q2	Delayed	Artemis II ICPS was delivered to KSC with some traveled work, but the completion date has slipped into FY 2023. To align with the change in Artemis II launch date, the final check-out of the ICPS is currently forecast for completion in Q2 FY23.
Artemis III Forward Skirt Structural Weld Complete	FY 2022 Q3	Completed	The Artemis III Forward Skirt structural weld was completed in March 2022. This activity is on the critical path of the Core Stage Forward skirt delivery.
Launch Artemis I	FY 2022 Q4	Delayed	Due to technical issues, the Q4 launch attempts were scrubbed; the program is positioned to support a November 14, 2022 launch.
Complete Artemis II Booster Segment stacking	FY 2023 Q1	Delayed	The Artemis II Booster Segment stacking has been delayed due to Artemis I launch slips and is now expected to be completed in FY 2023 Q2. Booster segments for Artemis II are complete and are in storage. In consideration of the limit life constraint associated with booster stacking, the planned stacking date aligns with changes in Artemis II launch periods
Announce awards for sustaining lander development	FY 2023 Q2	On track	The HLS sustaining lander development awards are on track and continue to make progress towards awarding the HLS contracts in FY 2023.
Deliver the Artemis II Core Stage to Kennedy Space Center	FY 2023 Q3	On track	NASA continues to make progress on the Artemis II Core Stage.
Habitation and Logistics Outpost (HALO) systems Critical Design Review (CDR) closeout	FY 2023 Q4	On track	

# Narrative – FY 2022 Q4

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The programs in **Artemis Campaign Development (ACD)** division completed key milestones in FY 2022:

- In late FY 2022 Q4, NASA announced the selection of Axiom Space to deliver an extravehicular Activity (EVA) system for the Artemis III mission. This award – the first one for Exploration EVA (xEVAS) spacesuits (which was competed) – is for a task order to develop a next generation Artemis spacesuit and supporting systems, and to demonstrate their use on the lunar surface during Artemis III. In June, NASA held a media event to announce the selection of Axiom Space and Collins Aerospace to advance spacewalking capabilities in low Earth orbit and at the Moon.
- In FY 2022 Q4, NASA released the Human Landing System (HLS) Sustaining Lunar Development solicitation for proposals for sustainable lunar lander development and demonstration as the Agency works toward a regular cadence of Moon landings. (More information is available in NASA's [press release](#).) NASA is on track to complete the second milestone for FY 2023 – to announce the awards. These efforts will pave the way for multiple companies to provide recurring Moon landing services beyond the Artemis III mission. Companies selected under this contract will be required to perform one uncrewed and one crewed lunar landing demonstration. NASA will certify any lander system to meet its requirements prior to the crewed demonstration mission(s).
- Throughout FY 2022, ACD and its partners completed key milestones for Gateway. The European Space Agency conducted the Preliminary Design Review (PDR) Closeout Board for the International Habitat (I-HAB), a Gateway element, on November 18. Gateway continued executing Level 2 Subsystem Preliminary Design Reviews (PDRs); the program planned for a total of 33 PDRs. Due to some remaining open work, Gateway is planning a Sync Review Closeout in early FY 2023; the closeout precedes the Gateway Key Decision Point (KDP)-C. The PDR Part 2 for the Power and Propulsion Element (PPE), the thruster system that will propel Gateway around the Moon, was held November 29-December 2.
- In early November, the U.S. Court of Federal Claims denied Blue Origin's bid protest, upholding NASA's [selection](#) of SpaceX to develop and demonstrate a modern human lunar lander. The end of HLS Next-STEP Appendix H Option A Stay of Performance allowed NASA to begin meaningful execution of the contract and interaction with SpaceX.

## Narrative – FY 2022 Q4 (continued)

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The programs in the in **Common Exploration System Development (CESD)** division completed key milestones in FY 2022:

- NASA did not complete the Q4 milestone during FY 2022. NASA performed two launch attempts of the Artemis I mission; the first launch attempt was scrubbed after teams were not able to chill down the four RS-25 engines with Liquid Hydrogen (LH<sub>2</sub>) to a cryogenic level of approximately minus 420 degrees F, with engine 3 showing higher temperatures than the other engines. Teams also saw a hydrogen leak on a component of the tail service mast umbilical quick disconnect. The second launch attempt was scrubbed due to a new hydrogen leak. Both launch attempts yielded a wealth of lessons learned on cryogenic loading operations, which will be applied for subsequent Artemis missions. The next launch attempt will take place between November 14 and 16, 2022. During the time between the second and third launch attempts, the team coordinated with Range on extension of Flight Termination System (FTS) waiver, developed a troubleshooting plan and fault tree for the LH<sub>2</sub> cryogenic seals, and refined cryogenic loading Concept of Operations changes.
- NASA completed the first milestone for Artemis II – the Artemis II Crew Module Adapter and European Service Module structural mate – in October 2021. The combined modules are now known as the Service Module. NASA delayed the Artemis II Q2 milestone – complete the Artemis II Interim Cryogenic Propulsion Stage – until FY 2023 Q2 to align with change of the Artemis II launch date. Completion of the Core Stage 2 Forward join and 4/5ths joint has shifted the focus to LH<sub>2</sub> tank outfitting and completion of the Engine Section. Both remain on track for completion in 2023. The second portion of Crew Module functional testing is currently in work; completion of functional testing is expected in time for recovery of Artemis I non-core avionics, which will be refurbished and installed in the Artemis II Crew Module, followed by the mating of the Crew and Service Modules.
- NASA completed the Artemis III Forward Skirt (which sits atop the Core Stage) structural weld in March 2022, completing the Q3 milestone for this APG. This activity is on the critical path of the Core Stage Forward skirt delivery.
- NASA's Exploration Ground Systems program is modifying Pad 39B to accommodate Artemis II. A new 1.4-million-gallon LH<sub>2</sub> cryogenic sphere was recently installed.