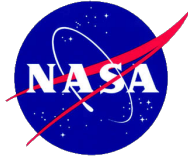


Agency Priority Goal Action Plan

# Artemis 2024 Lunar Landing

**Goal Leader:** Thomas Whitmeyer, Acting Deputy Associate Administrator, Exploration Systems Development

**Deputy Goal Leader:** Mark Kirasich, Deputy Associate Administrator, Advanced Exploration Systems



# Overview

## Goal Statement

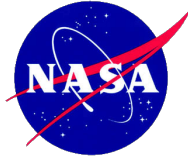
- Advance America's goal to land the first woman and the next man on the Moon by 2024 and pursue a sustainable program of exploration by demonstrating capabilities that advance lunar exploration. By September 30, 2021, NASA will launch Artemis I and make significant progress for Artemis II, as well as have multiple companies under contract to develop systems to land humans on the Moon.

## Challenge

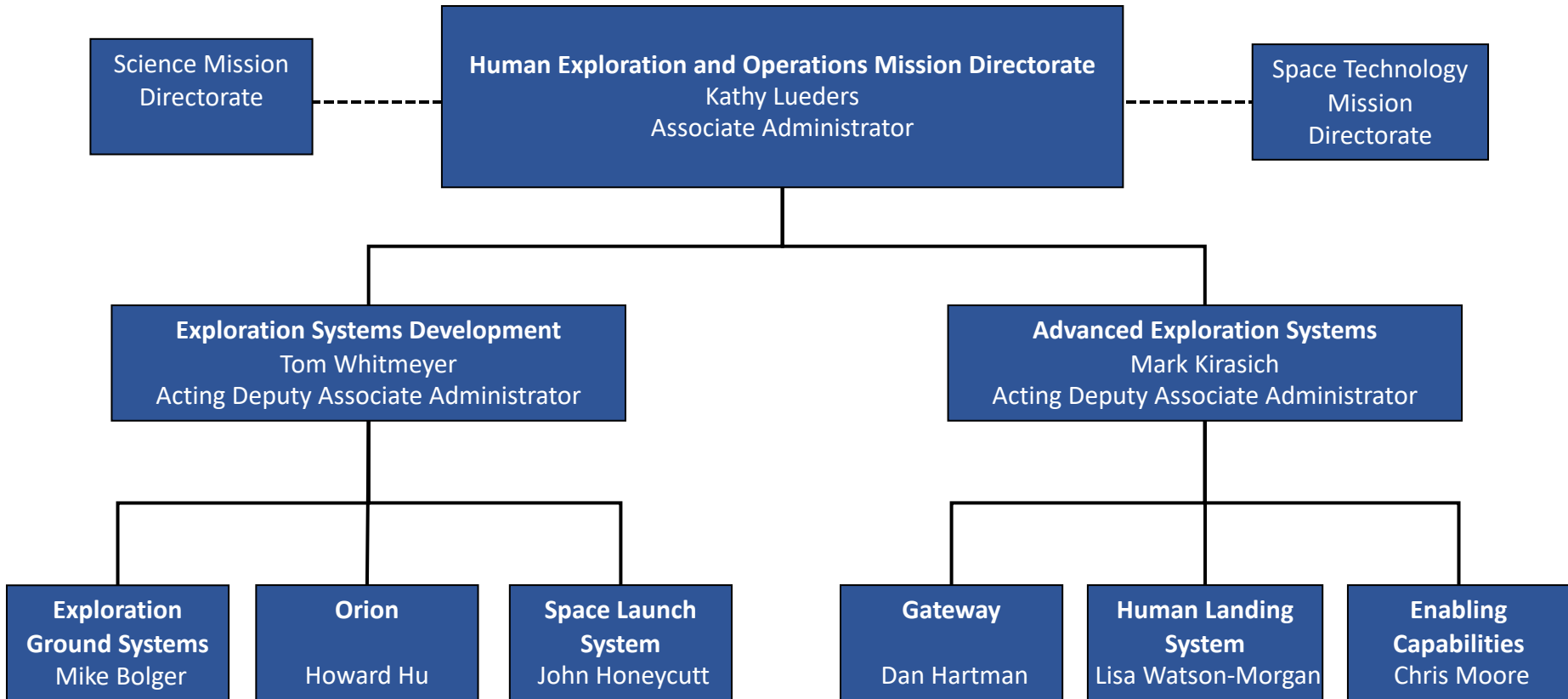
- Successfully execute long-duration space exploration missions - to the Moon and then Mars - while developing new commercial launch capabilities, launch vehicles, spacecraft, lunar lander, life support systems, ground support systems, surface habitation and mobility systems.

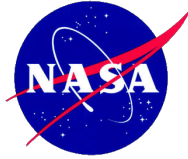
## Opportunity

- These systems will carry humans to the Moon and farther into space than ever before.
- NASA is building a national capability that includes state-of-the-art facilities used by aerospace companies, a broader and more advanced supplier base to drive down costs and meet industry demands, and a highly skilled national workforce to support the growing aerospace field.
- NASA's human exploration portfolio will advance American leadership in space, creating a path for peace, diplomacy, and global cooperation.



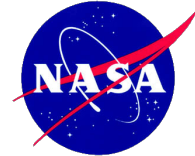
# Leadership & Implementation Team





# Goal Structure & Strategies

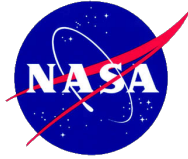
- Exploration Systems Development (ESD) will systematically progress through major qualification, testing, and production milestones to ensure the success of the Space Launch System (SLS) and Orion spacecraft on Artemis I (uncrewed test flight), Artemis II (crewed test flight), and Artemis III (crewed mission to lunar surface)
- Advanced Exploration Systems (AES) will use innovative procurement and management approaches to develop the core capabilities (Gateway, Surface Suits, and Human Landing System) needed to conduct the lunar surface mission in 2024 and enable multiple launch options for lunar missions.
- The Space Technology Mission Directorate (STMD) will pursue the maturation of technologies that will enable exploration activities, including cryo fluid management, In-situ Resource Utilization (ISRU), kilowatt generation, precision landing, and Solar Electric Propulsion (SEP).
- The Science Mission Directorate will collaborate to identify the optimal lunar surface location for Artemis mission activities and operations, as well as the definition of science goals and objectives.



# Summary of Progress – FY 2020 Q4

During FY 2020 Q4, Orion, Space Launch System (SLS), Exploration Ground System (EGS), and Advanced Exploration Systems (AES) made measureable progress towards Artemis I, Artemis II, and Artemis III missions despite challenges associated with COVID-19. All work was completed in accordance with CDC guidelines for workforce safety.

- SLS continued to make great progress on Core Stage Green Run testing and just recently completed the Delta Test Readiness Review for the final two Test Cases: Wet Dress Rehearsal and Hot-Fire. As of the end of Q4, SLS completed six out of eight test objectives, despite the impact of an unprecedented hurricane season (six separate weather events) on top of the COVID-19 impact.
- While SLS Core Stage Green Run testing was halted by more than two months due to COVID-19, the SLS has made appreciable progress in preparation for the remaining Green Run test activities at the Stennis Space Center. However, due to hurricane and COVID-19 impacts, NASA did not achieve the Q4 milestone to perform the Green Run hot fire test during FY 2020.
- SLS completed all and stored the four RS-25 Engines for Artemis II, which serve as backup engines for Artemis I.
- SLS continued to make good progress on Core Stage 2 at Michoud Assembly Facility (MAF).
- The Artemis I crew and service module continued final assembly, integration, and test operations at the Kennedy Space Center (KSC).
- The Orion launch abort system (LAS) attitude control motor for Artemis II was completed and shipped to KSC.
- EGS prepared the Solid Rocket Booster segments for the SLS in preparation for Artemis I launch. This involved inspection, rotation, and mating of the aft skirt and aft nozzle.
- EGS completed the Design Certification Review (DCR) for the Spaceport Command and Control System (SCCS) 6.3 software validation. This ensures that the newly developed ground processing software required to start process Orion is certified and ready.
- The EGS team successfully completed inert booster stacking pathfinder demonstration events, enabling completion of all Detailed Verification Objectives and providing invaluable training and certifications for technicians, engineers, and move directors prior to actual Artemis I Solid Rocket Booster Operations.
- AES selected the first U.S. commercial provider under the Gateway Logistics Services contract to deliver cargo, experiments and other supplies to the agency's Gateway in lunar orbit.
- AES selected three U.S. companies to design and develop human landing systems (HLS) for the agency's Artemis program under the Next Space Technologies for Exploration Partnerships (NextSTEP-2) Appendix H Broad Agency Announcement (BAA).
- The heroic efforts of the entire industry/government team allowed this APG to be rated yellow for FY 2020.



# Key Milestones

Progress update for the Artemis 2024 Lunar Landing APG.

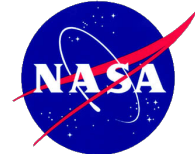
	FY 2020 Q1	FY 2020 Q2	FY 2020 Q3	Current Status FY 2020 Q4	Forecast FY 2021 Q1
Quarterly Rating	Green	Yellow	Green	Yellow*	➡
Milestones Achieved	1 of 1	1 of 2	3 of 3	3 of 4	0 of 4

➡	Unchanged	⬆	Improving	⬇	Deteriorating
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## Milestone Summary

Milestones	Milestone Due Date	Comments
Ship the Artemis I Orion spacecraft to Plum Brook Station for testing	FY 2020 Q1	Completed on November 25, 2019
Integrated Human Landing System contract Awards (NextSTEP-2, Appendix H)	FY 2020 Q2	Completed on April 30, 2020
Award Gateway Logistics Contract	FY 2020 Q3	Completed on March 27, 2020
Perform Green Run Hot Fire Test	FY 2020 Q4	Slipped to FY 2021 Q1 due to COVID-19 shutdown at Stennis Space Center and five name storms.
Initiate Artemis II Crew Module Functional Testing	FY 2021 Q1	
Begin outfitting of the Artemis II Launch Vehicle Stage Adapter	FY 2021 Q2	
Complete Artemis I Core Stage mate to Boosters	FY 2021 Q3	
Launch Artemis I	FY 2021 Q4	

\* FY 2020 Q4 might have been green without COVID-19 impacts.



# Data Accuracy and Reliability

## Verification and Validation:

- NASA monitors and tracks its progress towards this goal using various Agency documents and reports, including Directorate Program Management Council materials, Quarterly Program Status Report packages, project schedules, and other program-internal documents.

## Data Source(s):

- Press releases and program-internal documents indicating whether or not NASA has met its major quarterly development milestones such as Baseline Performance Review presentation.

## Level of Accuracy Required for Intended Use:

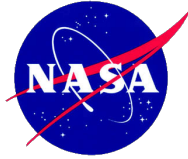
- Using the documents and reports referenced above, the Agency is able to accurately report at the end of each quarter on whether or not it has met its planned milestones.

## Data Limitations:

- NASA has not identified any data limitations that would preclude it from reporting accurate, reliable, and timely performance information.

## How the Agency Compensates for Data Limitations:

- Not applicable.



# Additional Information

## Contributing Programs

### NASA Program Activities:

- The principal contributors to this goal are the Exploration Systems Development programs (Exploration Ground Systems, Orion, and Space Launch System) and the Advanced Exploration Systems programs (Gateway and Human Landing System).
- Other NASA organizations that contribute to the goal include the Space Communications and Navigation, Rocket Propulsion Test, and Exploration Research & Technology programs, both the Space Technology and Science Mission Directorates, and the Office of the Chief Technologist.

### Other Federal Activities:

- Other federal contributors include the United States Air Force, United States Navy, and United States Army. NASA also conducts tests at Department of Defense facilities.

### International Partners:

- The European Space Agency is a partner on the Orion Service Module, which will serve as the primary power and propulsion component of the Orion spacecraft.

## Stakeholder/Congressional Consultations

- NASA provides regular status updates to Congress, including quarterly reports on SLS funding. NASA also provides regular progress briefings to Congressional staff.
- NASA supports regular audits by the Government Accountability Office (GAO) as part of both the annual "Assessment of Major Projects" report and other focused reviews.
- NASA provides status updates to the Aerospace Safety Advisory Panel and the NASA Advisory Council.