Agency Priority Goal Action Plan

Artemis 2024 Lunar Landing

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

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Fiscal Year 2020, Quarter 3

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.

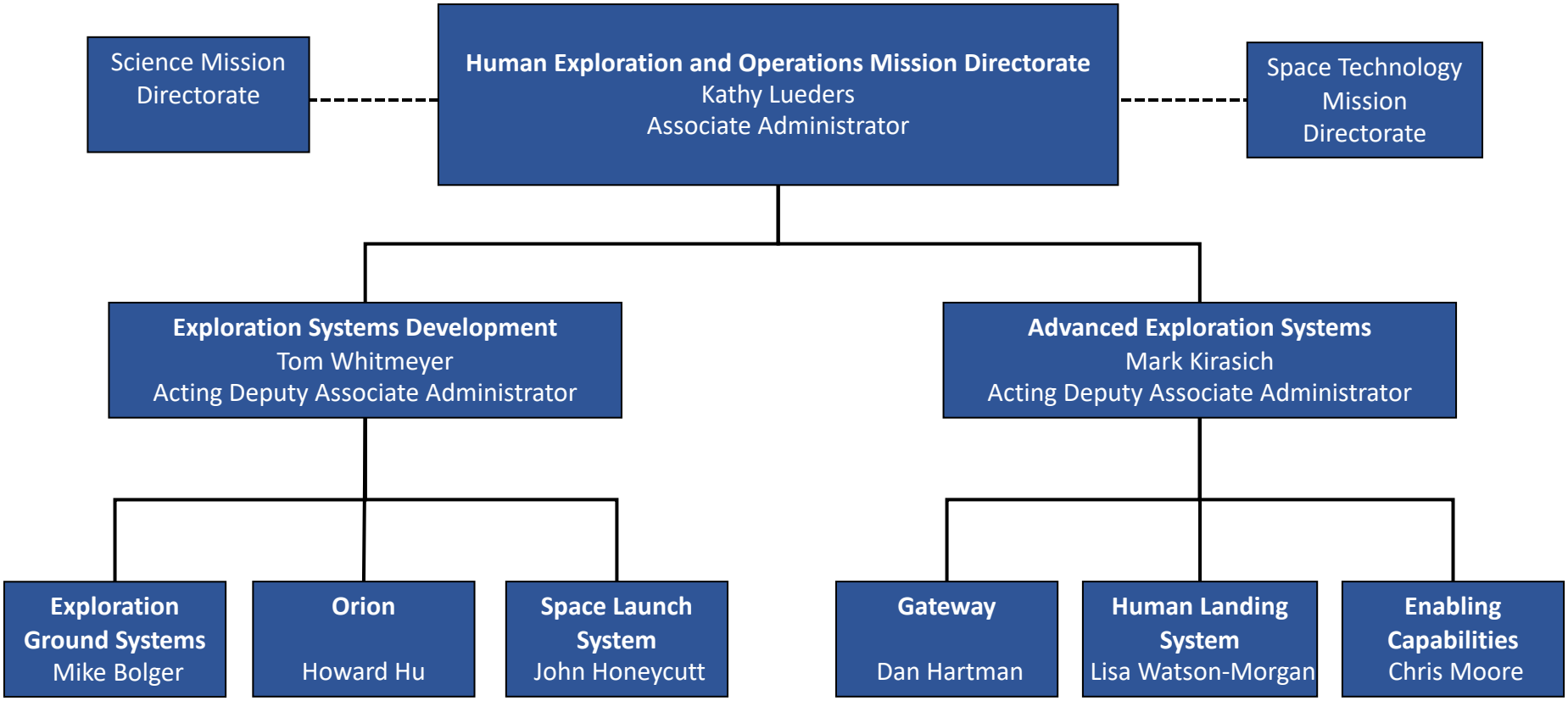
Challenge

- 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), kilopower 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 Q3

During FY 2020 Q3, 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.

- Space Launch System (SLS) resumed work on the Core Stage Green Run testing that was halted by more than two months due to COVID-19. As of the end of Q3, SLS completed 3 out of 8 test objectives, however, progress continues to be slowed by sustained incident rates in the local area.
- SLS shipped 10 motor segments from Utah to Kennedy Space Center (KSC).
- SLS completed a successful Liquid Oxygen (LOX) Tank Structural Test Article (STA) Test to Failure. This was the last test in the 3-year structural campaign to ensure the rocket's structure was designed to endure the rigors of spaceflight.
- SLS continued to make good progress on Core Stage 2 at Michoud Assembly Facility.
- Orion completed the final structural test article (STA) test required to support the qualification of the Orion structural design for the Artemis I flight.
- The Artemis I crew and service module continued final assembly, integration, and test operations at KSC.
- The Orion launch abort motor for Artemis II was completed and shipped to KSC.
- EGS made significant progress on the new 1.4 million gallon Liquid Hydrogen (LH2) Storage Sphere.
- EGS completed Spaceport Command and Control System (SCCS) 6.2.1 System Validation testing.
- EGS received and began processing boosters and motors for Artemis I.
- EGS utilized technology/new approaches to enable Launch Control Center firing room testing to accomplish critical work while social distancing.

Key Milestones

Progress update for the Artemis 2024 Lunar Landing APG.

	Q1	Q2	Current Status FY2020 Q3	Forecast FY2020 Q4
Quarterly Rating	Green	Yellow	Green	⇩
Milestones Achieved	1 of 1	1 of 2	3 of 3	

⇨ Unchanged ⇧ Improving ⇩ Deteriorating

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	
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	

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.