Agency Priority Goal Action Plan

James Webb Space Telescope

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Performance.gov

Fiscal Year 2019, Quarter 1&2

Overview

Goal Statement

- Revolutionize humankind's understanding of the Cosmos and humanity's place in it. The James Webb Space Telescope (Webb) will study every phase in the history of our universe, ranging from the first luminous glows after the Big Bang, to the formation of other stellar systems capable of supporting life on planets like Earth, to the evolution of our own solar system. By September 30, 2019, NASA will initiate on-orbit commissioning of Webb after launch.

Challenge

- Complete integration and test of largest cryogenic telescope ever to be launched.

Opportunity

- The Webb program will produce an astronomical observatory capable of watching the universe light up after the Big Bang. It will revolutionize humankind's understanding of the Cosmos and our place in it.
- This observatory is key for meeting NASA's strategic goal to expand human knowledge through new scientific discoveries.
- Webb is NASA's new telescope that will allow us to explore deeper into space and see things that even the Hubble Space Telescope cannot see.

Goal Structure & Strategies

In continuing to work with its partners toward completion of Spacecraft Element (SCE) environmental testing, OTIS* integration to the SCE, and observatory-level environmental testing, NASA will:

- Conduct high-level (corporate Vice President and above) quarterly meetings of all mission partners to ensure accurate, consistent knowledge of program status and challenges.
- Conduct quarterly discussions between the NASA Administrator and the Northrop Grumman Chief Executive Officer.
- Provide quarterly updates to the Office of Management and Budget (OMB) and the Office of Science and Technology Policy (OSTP).
- Employ Estimate-at-Complete analyses that incorporate the current risk posture, independent analysis of those data, and detailed tracking of lower-level milestones that lead up to the APG, as well as schedule health assessments. (The project receives monthly earned value management and schedule health reports that detail how the work is progressing with respect to the plan and budget.)
- Continue practice of Standing Review Board (SRB) member participation in key reviews. An example is the System Integration Review (SIR) in late FY 2019. Key SRB members will also participate in other reviews, such as the recent schedule assessment review. The SRB subject matter experts provide independent impartial assessments of the project's readiness to support the major upcoming activities along the APG schedule.

**OTIS is the combined Optical Telescope Element (OTE) and Integrated Science Instrument Module (ISIM)*

Summary of Progress – FY19 Q1-Q2

NASA is implementing the replan for the March 2021 JWST launch readiness date (LRD), and the spacecraft has started environmental testing. The Program has closed out 30 of the 32 Independent Review Board recommendations. NASA has also extended memorandums of understanding (MOUs) with the Canadian Space Agency (CSA) and will complete the extension with the European Space Agency (ESA) by the end of CY2019. The ESA MOU includes the provision of the Ariane 5 launch vehicle for the new LRD.

Key Q1 and Q2 Activity/Accomplishments:

- Q1: The project completed the spacecraft element (SCE) acoustics testing and initiated the SCE sine/vibration testing. The JWST Mission Operations Center at the Space Telescope Science Institute conducted a science operations rehearsal.
- Q2: The project completed the SCE sine/vibration testing. (Analysis results were completed in April.) The testing proceeded slower than planned due to sunshield membrane release device (MRD) qualification and additional analysis between runs on the first axis to fully understand system dynamics. Pre-test functional anomalies delayed the initiation of SCE thermal vacuum (TVaC) testing to April 7, seven days beyond Q2.

Key Milestones

NASA follows an "alternative form," or milestone-based, approach to reporting on its goals. Following are key quarterly milestones that NASA tracks in support of this goal:

Milestone Summary

Key Milestone	Milestone Due Date	Milestone Status	Risk/ Outlook	Comments
Complete pre-environmental testing of sunshield deployment.	FY 2018 Q1	Green	n/a	• Completed October 23, 2017.
Ship telescope from Johnson Space Center to Northrop Grumman.	FY 2018 Q2	Green	n/a	• Shipped February 1, arrived February 2.
Deliver results from spacecraft element acoustic and vibration tests.	FY 2018 Q3	Red	⇧	• Delayed. Loosened hardware discovered during acoustic testing. Corrective actions identified and being implemented. Results from acoustic and vibration tests delivered April 2019.
Complete integration of the telescope onto the spacecraft element.	FY 2018 Q4	Red	⇧	• Delayed. Estimated date of completion October 2019, consistent with rebaselined schedule. Schedule is on plan.
Complete spacecraft element acoustic and vibration testing.*	FY 2019 Q1	Yellow	⇨	• Completed January 2019. SCE sine/vibration testing proceeded slower than planned due to membrane release device (MRD) qualification and additional analysis between runs to fully understand system dynamics.
Initiate spacecraft element thermal vacuum testing.*	FY 2019 Q2	Yellow	⇨	• Initiated later than planned due to pre-test functional testing anomalies. Started April 7, seven days beyond Q2.
Complete spacecraft element thermal vacuum testing.*	FY 2019 Q3	Green	⇨	• On track
Complete System Integration Review.*	FY 2019 Q4	Green	⇨	• On track

**In June 2018, NASA re-baselined the mission to account for technical challenges during development. The FY19 quarterly milestones have been revised to align with the re-baselined schedule.*

Trend Legend					
⇧	Improving	⇨	No Change	⇩	Declining

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 (DPMC) materials, monthly reports from the project and industry partners, and other program-internal documents.

Data Source(s):

- Emails and program-internal documents indicating progress NASA's industry partners make toward the James Webb Space Telescope integration, test and launch.

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:

- Materials from the industry partners may include company proprietary information; such information cannot be released publicly.

How the Agency Compensates for Data Limitations:

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

Additional Information

Contributing Programs

NASA:

- James Webb Space Telescope (Webb) Program
- Space Communications and Navigation

Other: Webb is an international collaboration among NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA).

- ESA is providing the Ariane launch vehicle and some of the scientific instruments, including the Near Infrared Spectrometer and Mid-Infrared Instrument.
- CSA is providing the Fine Guidance Sensor, which will enable Webb to point precisely, so that it can obtain high-quality images
- Northrop-Grumman Aerospace Systems (NGAS) is the main NASA industrial contractor, responsible for building the optical telescope, spacecraft bus, and sunshield, and preparing the observatory for launch. NGAS has led a team including three major sub-contractors: Ball Aerospace, Orbital-ATK, and Harris (formerly ITT Exelis).

Stakeholder/Congressional Consultations

NASA provides updates to Congress on the status of required milestones, in addition to quarterly updates to the Office of Management and Budget (OMB) and the Office of Science and Technology Policy (OSTP). NASA also routinely provides status to the Government Accountability Office (GAO).