



Report in Brief

August 12, 2019

Background

National Oceanic and Atmospheric Administration's (NOAA's) Geostationary Operational Environmental Satellites-R (GOES-R) series is NOAA's latest generation of weather satellites that orbit in space at a speed matching the Earth's rotation, allowing them to maintain fixed positions above the Western Hemisphere.

The GOES-R program is a collaboration between NOAA and the National Aeronautics and Space Administration (NASA). NOAA provides funding and is responsible for overall program integration, management, and operational mission success. It defines program requirements, is responsible for acquisition of the ground segment, and performs mission operations. NASA oversees the acquisition of the spacecraft, instruments, and launch vehicles, and manages the launches of the satellites.

The program consists of two launched satellites—GOES-16 and GOES-17—as well as two satellites that are under development: GOES-T and GOES-U. GOES-R series satellites are lettered until successfully reaching orbit, and then designations are converted to numbers (GOES-R and GOES-S were designated as GOES-16 and GOES-17, respectively, once they reached orbit).

Why We Did This Review

Our primary objective was to assess the adequacy of the GOES-R program's satellite development and testing, and the transition of launched satellites into operations. Our second objective was to monitor the program's progress on contracting actions and changes to minimize cost increases.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Geostationary Operational Environmental Satellite–R Series: Program Success Requires Added Attention to Oversight, Risk Management, Requirements, and the Life-Cycle Cost Estimate

OIG-19-022-A

WHAT WE FOUND

We identified inadequacies in the development, testing, and operations of the satellites, specifically:

1. ABI issues highlight the need for increased oversight in technical, programmatic, and contractual areas.
2. GOES-R series magnetometers are less accurate than the previous series, revealing opportunity for NOAA to refine its threshold requirement.
3. The GOES-R program did not identify and manage risk to the availability of GOES-East and GOES-West orbital positions.
4. Ground system server replacement will increase the program's life-cycle cost and presents risk management challenges.

We found potential monetary benefits of \$284,440,445 related to the fourth finding.

In an "Other Matter" section, we found that processes for reserving orbital positions may not be adequate to meet demands of an increasing number of satellites.

WHAT WE RECOMMEND

We recommend that the Assistant Administrator for Satellite and Information Services

1. Ensure the GOES-R program addresses anomalies on instruments fulfilling essential mission requirements using a distinct process that is proportional to the criticality of a key performance parameter.
2. Ensure an independent review of changes to the ABI contract's PEP occurs to determine their rationale, appropriateness, and need for further actions.
3. Ensure the GOES-R program updates reliability analyses for ABI, the satellite, and constellation, specifically given the unique conditions of the hardware on GOES-16 and GOES-17 and any design changes for GOES-T and GOES-U.
4. Ensure the GOES-R program documents its magnetometer design, integration, and on-orbit experience so that it is available to future GOES programs and contractors.

We recommend that the Deputy Under Secretary for Operations

5. Ensure that NOAA conducts analysis to determine distinct geomagnetic field measurement accuracy threshold and objective requirement specifications and ensure appropriately supported requirements are reflected in GOES-R program documents.
6. Ensure the NOAA Space Weather Prediction Center updates its geomagnetic field observation accuracy requirement validation documentation.
7. Ensure NOAA assesses whether GOES are the optimal satellites to achieve geomagnetic field observation requirements, using an analysis of alternatives or similar cost-benefit approach.

We recommend that the Assistant Administrator for Satellite and Information Services

8. Ensure that the GOES-R program formally manages risk to geostationary orbital positions for both current and future satellite programs.
9. Ensure the GOES-R program updates its LCCE incorporating results from Department's independent assessment.
10. Ensure the GOES-R program completes a prioritized list of off-ramps with triggering dates for server replacement activities.
11. Ensure the GOES-R program develops a plan to limit the risk of vendor lock-in for ground system sustainment.