



# Report in Brief

September 5, 2023

## Background

The National Oceanic and Atmospheric Administration's (NOAA's) polar weather satellites provide weather data to support forecasts and warnings of severe weather events. Polar satellites pass over the North and South Poles while continuously circling the planet. They contribute approximately 85 percent of the data for numerical weather prediction models.

Acquisition, development, and support for these satellites are managed by the Joint Polar Satellite System (JPSS) program. The program is a collaboration between NOAA and the National Aeronautics and Space Administration (NASA). NOAA provides funding and retains overall responsibility and authority for the program. It manages the acquisition and development of the ground system. NASA manages the satellites' acquisition and development.

In March 2015, the program awarded the spacecraft contract for the second JPSS satellite, JPSS-2. In 2022, the program led JPSS-2 through several major activities before its launch in November 2022. JPSS-2 completed post-launch testing and is operating as NOAA-21.

The program is now building JPSS-3 and JPSS-4, with plans to finish developing and testing both satellites by 2026 and to launch them in 2027 and 2032.

## Why We Did This Review

Our audit objective was to assess the Polar Weather Satellite program's execution of selected development activities. To satisfy our objective, we examined aspects of the program's environmental test campaign and pre-launch readiness efforts for JPSS-2.

## National Oceanic and Atmospheric Administration

Satellite Integration and Test Phase Improvements Are Needed to Ensure the Success of Future Polar Weather Satellite Missions

OIG-23-027-A

## WHAT WE FOUND

Generally, the program was successful in the testing and readiness efforts we reviewed for JPSS-2. However, we found the program should do the following:

- I. Take additional steps to ensure instruments on JPSS-3 and JPSS-4 are protected from contamination and tested as they will fly. We found issues with contamination controls in a test the JPSS-2 contractor conducted to demonstrate that the satellite could operate in the vacuum and extreme temperatures seen in space.
- II. Improve its lessons-learned process so it and other programs can learn from its experiences. Recording lessons learned provides opportunities to improve satellite integration and other processes for NOAA/NASA missions.
- III. Improve its requirements verification process before JPSS-3 and JPSS-4 verification efforts begin. Requirements verification provides evidence that satellites meet contractual requirements.

## WHAT WE RECOMMEND

We recommend the NOAA Deputy Undersecretary of Operations direct the Assistant Administrator for Satellite and Information Services to do the following:

1. Ensure that controls are in place requiring the program to measure and compare contamination levels with defined limits before considering a waiver to Test as You Fly requirements for JPSS-3 and JPSS-4.
2. Ensure the spacecraft contractor revises its contamination controls to provide reasonable assurance that silicone contamination near the Ozone Mapping and Profiler Suite instrument remains below defined limits during JPSS-3 and JPSS-4 satellite integration and testing.
3. Ensure the JPSS program updates its JPSS Program Plan and JPSS Flight Project Plan to describe a lessons-learned approach that is executable and meets the needs of the program and NASA. The update should include specific management controls that ensure these needs are met.
4. Ensure the program defines and provides guidance to the spacecraft contractor on the expected level of documentation and artifacts necessary to support verifications.
5. Ensure the program identifies improvements to the verification review process, including the follow-on review of previously rejected verifications.

We provided a draft of this report to NOAA for review and response. NOAA concurred with our recommendations and provided comments with additional context as well as considerations it will need to make to address the recommendations.