Sentinel A4 Radar

In FY25, the Army divided the AN/MPQ-64A4 Sentinel (Sentinel A4) radar program's IOT&E into two phases. The Army Test and Evaluation Command (ATEC) conducted IOT&E Phase 1 from February through April 2025. IOT&E Phase 2 is scheduled for 2QFY26, during the Integrated Fires Test Campaign 2026 (IFTC 26). DOT&E has concerns about the adequacy of IOT&E Phase 2 since it will not test some of Sentinel A4's critical capabilities, nor will it be integrated with the concurrent IOT&E of the key launcher it is intended to support. Following the completion of IOT&E, DOT&E will provide an assessment of the Sentinel A4's operational effectiveness, suitability, and survivability in a classified report to inform the full-rate production (FRP) decision.

SYSTEM DESCRIPTION

The Sentinel A4 radar is a three-dimensional X-band active electronically scanned array radar developed to replace the legacy Sentinel A3 and improve short- and medium-range air defense capabilities. It is designed to detect, classify, and track multiple aerial threats, including rockets, artillery, mortars, cruise missiles, unmanned aircraft systems, and fixed- and rotary-wing aircraft. The radar is mounted on a modified M1095 Medium Tactical Vehicle trailer, towed by an M1083 Family of Medium Tactical Vehicles A2 (FMTV A2) cargo truck carrying the generator and communications equipment. The system is operated by a two-person crew.

MISSION

Army Air Defense Artillery units plan to employ the Sentinel A4 radar to provide 360-degree hemispherical surveillance and fire-control-quality tracking for short- and medium-range air defense engagements. The radar is designed to integrate into either the Forward Area Air Defense Command and Control network or the Army Integrated Air and Missile Defense (AIAMD) architecture via the Integrated Battle Command System, providing target track data to air and missile defense interceptors. The Sentinel A4 radar is intended to support both fixed-site defense missions and maneuvering forces. The Army also intends to use the Sentinel A4 radar in the Defense of Guam architecture.

PROGRAM

The Sentinel A4 radar is an Army Acquisition Category II program within the major capability acquisition pathway. As the radar is a critical component of the Army air defense mission, DOT&E placed the program under operational test oversight in February 2023, and the Milestone Decision Authority, Program Executive Office Missiles and Space, approved Milestone C in July 2023. In March 2024, DOT&E approved the program's TEMP, which planned a single-event IOT&E to support a September 2025 FRP decision.

In FY25, the Army split the Sentinel A4 IOT&E into two phases and moved the Sentinel A4 FRP date from September 2025 to 4QFY26. In March 2025, DOT&E informed the Army that due to the lack of funding and production-representative assets, the IOT&E Phase 1 test plan that ATEC submitted to DOT&E for approval was not adequate to evaluate Sentinel A4's operational effectiveness, suitability, and survivability. DOT&E subsequently acknowledged a test plan change request in May 2025 that indicated the Army's intention to conduct cybersecurity and electronic warfare testing in the second phase of IOT&E.

The Army plans for IOT&E Phase 2 to occur in 2QFY26 during IFTC 26 as a standalone event instead of integrated with the IOT&E of its primary engagement system – the Indirect Fire Protection Capability Inc 2 (IFPC Inc 2) launcher – which is planned to begin six weeks later at the same location during IFTC 26. While the Army acknowledges that these systems were intended to undergo IOT&E concurrently in support of testing for the Defense of Guam, it stated that combining the IOT&Es, as originally planned, does not support the Sentinel A4 4QFY26 FRP decision date.

Due to the lack of sufficient low-rate initial production (LRIP) radars and production-representative FMTV trucks to support IOT&E Phase 2, the Army plans to use one LRIP radar and production-representative FMTV A2 truck and two pre-LRIP prototype radars, both connected to FMTV A1P2 trucks instead of FMTV A2 trucks. The Army has not yet submitted to DOT&E an updated TEMP reflecting the revised two-phased test strategy, the associated resources, and planned FOT&E. To ensure adequate testing, it is important that the revised plan include testing of critical capabilities the radar was intended to provide and include the cybersecurity and electronic warfare testing the Army committed to executing in IOT&E Phase 2. There is a risk that if the sole LRIP radar becomes unavailable during IOT&E Phase 2, the Army will be unable to collect data from any production-representative test assets for that phase of IOT&E. Despite the presence of a Sentinel A3 radar at the IFTC 26 test site, the Army has elected not to do a direct comparison between A3 and A4 to ensure no capability decrement.

» MAJOR CONTRACTOR

- Lockheed Martin Corporation – Syracuse, New York

TEST ADEQUACY

ATEC conducted IOT&E Phase 1 at White Sands Missile Range, New Mexico, from February through April 2025. DOT&E and the Army observed that the test did not include production-representative Sentinel A4 radar assets, operationally realistic network configurations, or the appropriate engagement systems intended to receive and use the radar's outputs to initiate an engagement. DOT&E is now coordinating with the Army to assess whether the testing planned in the second phase of IOT&E will be adequate to evaluate the system's operational effectiveness, suitability, and survivability.

The Army had planned for the Sentinel A4 radar to participate in IFTC 26 operational test events that integrated with AIAMD architecture and other air and missile defense sensors and shooters. Instead, these systems

will be tested separately to accommodate the Sentinel A4 FRP date of 4QFY26. These events, whether standalone or integrated, rely on modeling and simulation (M&S) tools to execute simulated air battle scenarios that cannot be replicated with real aircraft and threats. The Sentinel A4 radar program must complete verification, validation, and accreditation of the M&S tools that will support a credible assessment of operational effectiveness in a realistic threat environment.

PERFORMANCE

» EFFECTIVENESS, SUITABILITY, AND SURVIVABILITY

DOT&E will provide an assessment of Sentinel A4 radar's operational effectiveness, suitability, and survivability following the completion of IOT&E.

RECOMMENDATIONS

The Army should:

1. Consider moving the Sentinel A4 FRP decision date one quarter to the right, from 4QFY26 to 1QFY27, to allow for an integrated IFTC 26 IOT&E that includes both the Sentinel A4 sensor and the IFPC Inc 2 launcher, as the Army originally intended.
2. Execute IOT&E Phase 2 in accordance with the DOT&E-acknowledged operational test plan change request, addressing all capability areas not tested in Phase 1 and including production-representative radars.
3. Develop M&S tools, along with a verification, validation, and accreditation strategy, to support future Sentinel A4 radar operational testing, as recommended in the FY24 Annual Report.
4. In accordance with DoD Instruction 5000.98, update the Sentinel A4 TEMP for its 4QFY26 FRP decision to reflect testing the program will be unable to complete prior to FRP and how those testing gaps will be addressed post-FRP.