

F/A-18E/F Super Hornet

Executive Summary

- The Navy released System Configuration Set (SCS) H14 in September 2019 for use in the F/A-18E/F Super Hornet and EA-18G Growler fleets, and utilized that software throughout 2020. The Navy completed operational testing of SCS H14+ in 1QFY21 but has not yet released it to the fleet.
- DOT&E concluded that SCS H14 added operational capabilities to the Super Hornet and that the F/A-18E/F is operationally suitable in a classified report signed in June 2020.
 - The Super Hornet demonstrated improved Naval Integrated Fire Control (NIFC) – Counter Air (CA) capabilities.
 - The active electronically scanned array (AESA) radar did not meet reliability requirements.
- The Navy did not complete the operational cybersecurity testing required by the H14 Test and Evaluation Master Plan (TEMP).
- Developmental challenges resulted in the Navy delaying the start of operational testing of SCS H16 for Block II aircraft from September 2020 to January 2021; however, integrated testing began 1QFY21. SCS H16 will introduce the following capability upgrades and enhancements: AESA electronic protection improvements, NIFC improvements, net-enabled weapons (NEW) improvements, Infrared Search and Track (IRST) Block II integration, Integrated Defensive Countermeasures (IDECM) suite improvements, and mission planning improvements.
- The Navy took delivery of its first two Block III F/A-18E/F developmental test aircraft in June 2020.

System

- The F/A-18E/F Super Hornet is the Navy's follow-on replacement to the F/A-18A/B/C/D and the F-14.
- F/A-18E/F Super Hornet Block II hardware includes the APG-79 radar (Lots 26+), Advanced Targeting Forward Looking Infrared pod, Multifunctional Information Distribution System for Link 16 tactical datalink connectivity, Joint Helmet Mounted Cueing System, and IDECM. The software enables the F/A-18E/F to perform single-pass multiple targeting for GPS-guided weapons, and allows for the use of off-board target designation, improved datalink for target coordination precision, and the implementation of air-to-ground target aim points.
- F/A-18E/F Super Hornet Block III acquisition includes the purchase of new aircraft and the retrofit of Block II airframes. Improvements planned include an Advanced Network Infrastructure that consists of a Tactical Targeting Network Technology (TTNT) and a Distributed Targeting Processor-Networked (DTP-N), a second Generation 5 radio, high-definition video recording, Advanced Cockpit System,



Common Tactical Picture, reduced radar cross section, and airframe extension to 10,000 flight hours.

System Configuration Set Software (SCS)

- Super Hornet aircraft include SCS operational software, the periodic update of which enables major combat capability enhancements.
 - F/A-18E/F (prior to Lot 25) aircraft use “X-series” software. The Navy released SCS 25X on legacy Hornet and older Super Hornet aircraft in October 2015.
 - F/A-18E/F (production Lot 25+) Block 2 aircraft use high-order language software. The Navy completed operational testing of SCS H14 in January 2020, SCS H14+ in 1QFY21, and plans to begin operational testing of SCS H16 for Block II aircraft in early 2021.
- SCS H16 for F/A-18E/F Block II will introduce the following capability upgrades and enhancements: AESA electronic protection improvements, NIFC improvements, NEW improvements, IRST Block II integration, IDECM improvements, and mission planning improvements. The Navy plans for the same capabilities, as well as an Advanced Network, to be included in Block III SCS H16.

Mission

Combatant Commanders use the F/A-18E/F to:

- Conduct offensive and defensive counter-air combat missions
- Attack ground targets with most of the U.S. inventory of precision and non-precision weapons
- Provide organic in-flight refueling to the Carrier Strike Group
- Provide the fleet with an organic tactical reconnaissance capability

FY20 NAVY PROGRAMS

Major Contractors

- The Boeing Company, Integrated Defense Systems – St. Louis, Missouri
- Raytheon Company – Forest, Mississippi
- General Electric Aviation – Evendale, Ohio
- Northrop Grumman Corporation – Bethpage, New York
- Lockheed Martin – Orlando, Florida

Activity

- DOT&E approved the F/A-18E/F SCS H14 TEMP on February 1, 2019. The Navy operationally tested SCS H14 in accordance with the DOT&E-approved TEMP, completing in January 2020.
- DOT&E approved the SCS H14+ test plan in June 2020. H14+ testing was executed in accordance with the test plan in August 2020.
- The coronavirus (COVID-19) pandemic delayed the completion of the DOT&E classified report of SCS H14 FOT&E to June 2020 due to limited access to computer authoring and analysis tools.
- The Navy was required to submit a separate cybersecurity test plan for DOT&E approval, but did not do so. However, the Navy incorporated cybersecurity test considerations in the SCS H16 TEMP and test plan.
- Developmental challenges resulted in the Navy delaying the start of operational testing of SCS H16 for Block II aircraft from September 2020 to January 2021, although integrated testing commenced in 1QFY21. DOT&E approved the Block II SCS H16 TEMP and test plan in 1QFY21, and the Navy plans to conduct an Operational Test Readiness Review in 2QFY21.
- Fleet release of SCS H16 is anticipated 4QFY21.
- The Navy took delivery of its first two Block III F/A-18 E/F developmental test aircraft in June 2020. Block III acquisition will include both the purchase of new airframes and the retrofit of Block II aircraft.

Assessment

- DOT&E completed its assessment of SCS H14 operational testing and published a classified operational test report in June 2020. DOT&E noted the following:
 - Analysis validated SCS H14 improvements to the F/A-18E/F's operational capability. The AESA radar did not meet reliability requirements.
 - The Navy's data are not sufficient to assess F/A-18 E/F performance. The Service operational test agencies need to fully embrace existing data collection and analysis techniques to adequately account for emerging threat impacts on the rapidly evolving operational environment.
- The Navy has planned for the requirement to conduct an end-to-end, multiple AIM-120 missile test to demonstrate the AESA radar's ability to support this required capability; however, resource limitations have precluded execution.

Recommendations

The Navy should:

1. Allocate adequate resources for planning and conducting comprehensive Super Hornet cybersecurity operational testing.
2. Utilize more robust data collection and analysis methods during operational test events, to include continuous measures, to more adequately assess F/A-18 capability in the rapidly evolving threat environment.
3. Plan and resource end-to-end testing employing multiple AIM-120 missiles.