

F/A-18E/F Super Hornet and EA-18G Growler



Both the F/A-18E/F Super Hornet and EA-18G Growler programs experienced development challenges in the latest software configuration set (SCS) update. As a result, Phase II of SCS H16 operational test (OT) was approved in May 2022 for both Block II and Block III F/A-18E/F Super Hornet variants, and for the EA-18G Growler, while FOT&E events commenced in 4QFY22. The Navy expects to complete F/A-18E/F Block II and Block III OT in 1QFY23 with fleet release in December 2022. The EA-18G Growler OT will continue into 2023.

SYSTEM DESCRIPTION

The F/A-18E/F Super Hornet is a twin-engine, supersonic, all-weather, carrier-capable, multirole combat aircraft performing a variety of roles, including air superiority, fighter escort, suppression of enemy air defenses, reconnaissance, forward air control, close and deep air support, day and night strike, and aerial refueling. The F/A-18E/F Super Hornet is the replacement

for the F/A-18A through D and the F-14, and it complements the F-35C in a carrier environment. The F/A-18E/F Block III Super Hornet aircraft leverages ongoing production of the Kuwaiti Super Hornet; it is also available as a Block II aircraft retrofit. F/A-18E/F Block III Super Hornets include upgraded hardware, advanced cockpit displays, and improved networking capability.

The EA-18G Growler is a two-seat, electronic attack variant of the F/A-18E/F Super Hornet that can

provide standoff, escort, and self-protection jamming using both noise and deception techniques against land-based and airborne radar systems. The EA-18G Growler carries up to five AN/ALQ-99 tactical jammer system pods mounted under the wings and fuselage, which integrate with the internal AN/ALQ-218 electronic warfare system for detection and jamming. The EA-18G Growler also employs AGM-88 High-Speed Anti-Radiation Missile/Advanced Anti-Radiation Guided Missile for suppression of enemy air defenses

and the AIM-120 Advanced Medium-Range Air-to-Air Missile for self-protection. The Navy is currently testing the ALQ-249 (Next Generation Jammer – Mid Band) on the EA-18G Growler to eventually replace the ALQ-99.

The F/A-18E/F Super Hornet and EA-18G Growler are both supported by the same SCS product line. The currently fielded SCS for both aircraft is H14. The next SCS, H16, is currently undergoing testing in accordance with the DOT&E-approved operational test plan. SCS H16 brings improved capabilities to the APG-79 radar for both aircraft and includes two developmental branches: one for Block II F/A-18E/F and E/A-18G, and one for Block III F/A-18E/F. SCS H18, which is scheduled to begin operational test in FY23 in support of a phased fleet deployment approach, is intended to merge the two SCS H16 branches in to a single product line. SCS H18 integrates with EA-18G Growler capability modifications, such as ALQ-249, and brings EW and radar software improvements to the F/A-18E/F Super Hornet along with new weapons integration.

MISSION

Combatant Commanders use the F/A-18E/F Super Hornet to conduct offensive and defensive counter-air combat missions, and attack both ground-based and maritime targets with precision and non-precision weapons. The F/A-18E/F Super Hornet can also carry a pod to provide

organic aerial refueling capability to the carrier strike group.

The EA-18G Growler can operate forward deployed from expeditionary land bases or as part of a carrier air wing. It is employed as an embedded airborne EA platform, organic to the carrier strike group or integrated in the Joint Force. It can also be used in a tactical reconnaissance role.

PROGRAM

The F/A-18E/F Super Hornet is an Acquisition Category 1C program. In 2021, DOT&E approved SCS H16 phased entry into OT. DOT&E approved the second phase of F/A-18E/F and E/A-18G SCS H16 testing in May 2022. The F/A-18E/F Block II and Block III Super Hornet SCS H16 OT commenced with events in August and September 2022 to support the planned decision to field SCS H16 to the fleet by December 2022, but SCS H16 has shown reliability and performance issues throughout operational test. SCS H18 FOT&E is scheduled to begin during 3QFY23 after operational test readiness review is conducted in April 2023. SCS H18 will include EW and radar enhancements from SCS H16, along with weapons integration software for the Long-Range Anti-Ship Missile, Small Diameter Bomb II, and Joint Advanced Tactical Missile for the F/A-18E/F Super Hornet.

The Navy is also leveraging production of the Kuwaiti Super Hornet to purchase F/A-18E/F Block III aircraft, which include upgraded hardware, advanced

cockpit displays, and improved networking capability. Boeing delivered multiple F/A-18E/F Block III Super Hornets in 2021 and the Navy plans to retrofit existing Block II aircraft with the Block III upgrades.

The EA-18G Growler is an Acquisition Category 1D program. DOT&E placed the EA-18G Growler back on oversight in 2022 due to significant planned upgrades and testing required for SCS H16 and H18. Operational testing of EA-18G Growler capability modifications were deferred to SCS H18 due to delays in EA-18G Growler hardware upgrades.

» MAJOR CONTRACTORS

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

TEST ADEQUACY

In accordance with the DOT&E-approved test plan, the Navy is using continuous response variables to evaluate SCS H16 instead of relying on binary response data. This approach will improve test adequacy and result in a more robust evaluation

of F/A-18E/F Super Hornet performance as compared to OT of previous SCS releases. DOT&E is also working with the Navy to incorporate Open Air Battle Shaping and high-fidelity threat radar emulators with Active Electronically Scanned Arrays (AESA) into future test events, to include SCS H18 OT. F/A-18E/F Block II and III Super Hornet OT was delayed until September 2022.

The Navy executed the DOT&E-approved cyber test plan for F/A-18E/F Block II and E/A-18G SCS H16, but chose to defer planned cybersecurity testing for Block III SCS H16 until SCS H18 OT due to hardware delivery and resource constraints, and to resolve SCS H16 Block III software deficiencies.

PERFORMANCE

» EFFECTIVENESS

Past effectiveness evaluations of SCS versions prior to H16 concluded that the F/A-18E/F Super Hornet is effective in both air-to-air and air-to-surface environments. The SCS H16 FOT&E evaluates new and enhanced F/A-18E/F Super Hornet capabilities intended to bolster platform mission effectiveness. Effectiveness evaluations for F/A-18E/F Super Hornet Block II and Block III SCS H16 are anticipated to complete in FY23. The Navy has yet to conduct an

end-to-end multiple AIM-120 missile test to demonstrate the APG-79 AESA radar can support this required capability.

Due to delays in hardware capability modifications for the EA-18G Growler, the Navy deferred OT for most of the capabilities introduced by SCS H16 to the FOT&E phase for SCS H18. The initial builds of SCS H16 were designed to integrate with EA-18G Growler hardware modifications such as Next Generation Jammer – Mid Band (NGJ-MB), but since hardware upgrade delivery dates proved unpredictable, SCS H16 testing will continue with a focus on software improvements. As a result, EA-18G Growler SCS H16 FOT&E will focus on changes in software performance when compared to the EA-18G Growler performance threshold established with SCS H14, while hardware related capability improvements will be tested with SCS H18.

» SUITABILITY

Although DOT&E previously determined the Super Hornet to be operationally suitable, the APG-79 AESA radar has not met its reliability requirements outlined in the Operational Requirements Document. DOT&E will include an updated AESA radar evaluation as part of the final assessment of Block II SCS H16 operational suitability in the Block II SCS H16 report in 4QFY23.

» SURVIVABILITY

The Navy is leveraging completed developmental cybersecurity testing to inform the evaluation of Block II SCS H16 survivability in a cyber-contested environment. Additional SCS H16 cybersecurity testing was delayed due to software deficiencies and hardware delivery and resource constraints. The Navy has not yet addressed previous cybersecurity deficiencies nor developed a comprehensive roadmap to inform future cybersecurity testing.

RECOMMENDATIONS

The Navy should:

1. Complete planned SCS H16 and H18 operational test in order to evaluate needed capability improvements to the FA-18E/F Super Hornet and EA-18G Growler fleet.
2. Conduct comprehensive F/A-18E/F Super Hornet and EA-18G Growler cybersecurity testing and address previously identified cybersecurity deficiencies.
3. Improve the reliability of the APG-79 AESA radar.
4. Incorporate Open Air Battle Shaping and high-fidelity AESA threat radar emulators into future test events, to include SCS H18 FOT&E.