FFG 62 *Constellation*-Class Guided-Missile Frigate

In March 2023, DOT&E published a classified early operational assessment (EOA) report for the FFG 62 *Constellation*-class guided-missile frigate. The report identifies FFG 62 design risks to operational effectiveness and opportunities for design changes to mitigate the associated risks in the delivered ship. The FFG 62 Program expects delivery of the lead ship in 1QFY27.

SYSTEM DESCRIPTION

The FFG 62 class will be smaller and less capable than U.S. Navy destroyers and cruisers but will have more offensive capability and survivability than previous small surface combatants (e.g., littoral combat ships). Major weapons systems of the FFG 62 class include:

- Aegis Combat System
- AN/SPY-6(V)3F Enterprise Air Surveillance Radar
- AN/SLQ-32(V)6 Surface Electronic Warfare Improvement Program Block 2
- Mk 41 Vertical Launch System with Evolved Sea Sparrow Missiles and Navy Standard Missiles
- Mk 49 Guided Missile Launching System with Rolling Airframe Missile
- AN/SQQ-89(V)16 Undersea Warfare Combat System

- Thales Combined Active Passive Towed Array Sonar-4 (CAPTAS-4), a variable depth sonar not previously used by U.S. ships
- AN/SLQ-25 Nixie
- AN/SPS-73(V)18 Next Generation Surface Search Radar
- Mk 110 57-mm Gun (with Advanced Low-Cost Munitions Ordnance)
- Over-the-Horizon Weapon System
- MH-60R Seahawk helicopter (configurable to fire surface-attack Hellfire missiles and MK 54 Lightweight torpedoes)
- MQ-8C Fire Scout Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle with MD-4A Mission Control System

MISSION

The maritime component commander will employ FFG 62-class ships to support the National Defense Strategy across the full range of military operations. Specific mission areas include anti-air warfare, anti-submarine warfare, surface warfare, electronic warfare/ information operations, and intelligence, surveillance, and reconnaissance missions.

PROGRAM

FFG 62 is an Acquisition Category IB major capability acquisition program that achieved Milestone B in April 2020. The Navy approved the award of the Detail Design and Construction contract for the first ship, with options for up to 10 additional ships, and entry into the detail design and construction (production) phase with a low-rate initial production quantity of 20 ships. The FFG 62 Program intends to deliver the lead ship by December 2026.

In June 2020, DOT&E approved the FFG 62 Test and Evaluation Master Plan (TEMP), except for the strategy for testing its anti-air warfare (AAW) mission capability. DOT&E agreed to provide the Navy opportunity to show the adequacy of their proposed AAW test strategy. The Navy is in the process of collecting data that they believe supports this proposed strategy.

DOT&E approved the FFG 62 LFT&E strategy in April 2020. The FFG 62 LFT&E strategy included full-ship shock trials with the option of pursuing a modeling and simulation (M&S)-based shock trial alternative. However, after conducting a scoping study, the Navy concluded that an adequate shock trial alternative for FFG 62 would cost approximately two and half times more than a comparable full-ship shock trial. Therefore, the Navy will go forward with a full-ship shock trial in 3QFY30.

» MAJOR CONTRACTOR

- Fincantieri Marinette Marine – Marinette, Wisconsin

TEST ADEQUACY

In March 2023, DOT&E published a classified FFG 62 EOA report based on evaluations conducted between February 2022 and July 2022 and detailed in the FY22 Annual Report. Evaluations were adequate to determine potential FFG 62 design risks that could affect operational effectiveness and suitability of the delivered ship. The EOA provides the FFG 62 Program with an opportunity to consider modifications to the ship design. The FFG 62 Program will also use the EOA to inform development of the next TEMP revision expected to be completed in FY25. The Navy conducted the EOA in accordance with a DOT&E-approved test plan, and it was observed by DOT&E.

In FY23, the Navy conducted testing against a large scale-model of a generic ship incorporating characteristics typical of Navy standard ship structure and a responding mid-deck plate to generate response data for underbottom explosions. This test was similar to the test detailed in the FY22 Annual Report but focused on different structure response. Data from these tests provide validation data for survivability models used to predict the magnitude and extent of damage from underwater threat weapons. The Navy conducted this test in accordance with the DOT&E-approved test plan, and it was observed by DOT&E.

In FY23, the FFG 62 Program approved the FFG 62 Verification, Validation, and Accreditation (VV&A) Plans for the Advanced

Survivability Assessment Program (ASAP) and Navy Enhanced Sierra Mechanics (NESM) M&S tools. These plans are adequate to determine the sufficiency of these M&S within the LFT&E test strategy. Further, the Navy continued M&S modification that incorporates new capabilities, including improvements in the blast and whipping codes. The Navy is working closely with DOT&E on the development of M&S plans to support the Detail Design Survivability Assessment Report that the FFG 62 Program expects to publish in FY26.

PERFORMANCE

» EFFECTIVENESS

No data are available to determine FFG 62 operational effectiveness due to FFG 62 being in development. However, the FFG 62 design presents risks to operational effectiveness in each of its primary mission areas: air warfare, anti-submarine warfare, and surface warfare. Classified risks to operational effectiveness are in the FFG 62 EOA report. Unclassified risks to operational effectiveness include that the FFG 62 design does not have a tracker illuminator system, which is typically installed on other Aegis platforms, and that the design crew size will be highly reliant on currently unproven system automation and human system interfaces. The Navy acknowledges the risk of the current crewing strategy for FFG 62 and is working with the appropriate stakeholders to mitigate and eliminate the associated risk to mission performance. Further, the FFG 62 Program reports that they currently have sufficient access to technical information on the Thales CAPTAS-4 needed to effectively integrate it with the AN/SQQ-89(V)16 system.

» SUITABILITY

No data are available to determine FFG 62 operational suitability due to FFG 62 being in development. Further, reliability, maintainability, and availability data for hull, mechanical, and electrical systems are not yet available to identify associated risk in the FFG 62 design.

» SURVIVABILITY

No data are available to determine the cyber survivability of FFG 62 due to its early stage of development. Cyber survivability was not assessed during the EOA.

Insufficient data are available to determine FFG 62 survivability due to ongoing LFT&E. The Navy continued to close outstanding vulnerability knowledge gaps and support validation of survivability M&S through additional large-scale underwater explosion testing in FY23.

RECOMMENDATIONS

The Navy should:

1. Provide an update to the FFG 62 TEMP that includes the strategy to test anti-air warfare mission capability.
2. Continue to monitor the development of the mission system autonomy/ automation components in the ship design to minimize risk to mission performance and system maintenance capability, and if necessary, complete a reassessment of the adequacy of crew sizing to allow opportunity to incorporate modifications of the ship design, should additional crewing be required to support all intended missions.