

FFG 62 Constellation-Class – Guided Missile Frigate



In FY22, the Navy conducted an early operational assessment (EOA) of the *Constellation*-class (FFG 62-class) design in accordance with a DOT&E-approved test plan. Also in FY22, the Navy modified the FFG 62 design to include the Thales Combined Active Passive Towed Array Sonar-4 (CAPTAS-4) system, a variable depth sonar.

SYSTEM DESCRIPTION

The FFG 62 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 FFG 62 include:

- Aegis Combat System
- Enterprise Air Surveillance Radar (AN/SPY-6(V)3F)
- Surface Electronic Warfare Improvement Program Block 2 (AN/SLQ-32(V)6)
- 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

- 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 the *Constellation*-class 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

The FFG 62-class is an Acquisition Category IB Major Defense 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 ten additional ships, and entry into the Detail Design and Construction

(Production) phase with a low-rate initial production quantity of twenty ships. The Navy intends to deliver the lead ship by September 2026.

In June 2020, DOT&E approved the FFG 62 Test and Evaluation Master Plan, with the exception of the strategy for testing its anti-air warfare mission capability. The Navy is working on the revised strategy to test this capability.

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 Corporation – Marinette, Wisconsin

TEST ADEQUACY

Between February 2022 and July 2022, the Navy conducted an EOA of the FFG 62 ship design. This was done in accordance with a DOT&E-approved test plan, and observed by DOT&E. Subject matter experts in operations and maintenance reviewed the FFG 62 design to identify risks that could affect operational

effectiveness and suitability. The EOA provides the Navy with opportunity to identify and consider modifications to the ship design and informs operational testers in their development of an IOT&E test strategy.

In FY22, the Navy conducted testing against a large scale-model of a generic ship incorporating characteristics typical of Navy standard ship structure to generate response data of the test article to underwater explosions. This was done in accordance with the DOT&E-approved test plan, and observed by DOT&E. These tests subjected 100-foot long hulls constructed similar to Navy ships to damage that resulted in plastic deformation. The results from these tests will be used for validation of survivability models used to predict damage magnitude and extent from threat weapons.

PERFORMANCE

» EFFECTIVENESS

Not enough data are yet available to assess operational effectiveness due to the ship's early stage of development.

Preliminary assessment from the EOA suggest:

- Reduced developmental risk primarily due to the inclusion of previously fielded systems in the FFG 62 ship design.
- Some areas that could provide integration and/or performance challenges:

- FFG 62 will not include a tracker illuminator system typically installed on other Aegis platforms.
- In FY22, the Navy modified the FFG 62 design to include the foreign-designed, Thales CAPTAS-4 system, a variable depth sonar. While the Navy believes the integration of the CAPTAS-4 to the AN/SQQ-89 and the platform is low risk, DOT&E is unable to assess the integration risk at this time.
- FFG 62 crew size is limited to an estimated 193 officers and enlisted sailors with an additional 27 personnel that serve in the embarked aviation detachment. Mission success and sustainability will depend upon effective system autonomy/automation and human system interfaces.

DOT&E will submit a classified EOA report upon completion of analysis, expected in 2QFY23.

» SUITABILITY

Not enough data are yet available to assess operational suitability due to the ship's early stage of development.

» SURVIVABILITY

Not enough data are yet available to assess ship survivability.

Ongoing LFT&E testing, which include near-contact explosive testing, extended distance multiple plate ballistic testing, and large scale underwater explosion testing, have closed outstanding vulnerability knowledge gaps and are expected to enable M&S validation.

In FY22, the Navy continued to update M&S to incorporate new capabilities, including improvements to their blast and whipping codes. DOT&E continues to work with the Navy on M&S plans that will support validation and accreditation of these tools to support the

Detail Design Survivability Assessment Report in FY25.

RECOMMENDATIONS

The Navy should:

1. Provide an update to the FFG 62 TEMP that includes the strategy to test anti-air warfare mission capability by FY24.
2. Procure available and appropriate CAPTAS-4 technical data to mitigate performance risk and potentially reduce scope of operational testing.
3. In collaboration with operators and operational testers, closely monitor the development of the mission system autonomy/automation components in the ship design to minimize risk to mission performance and system maintenance capability.