T-AO 205 *John Lewis*-Class Fleet Replenishment Oiler

The Navy commenced IOT&E and LFT&E to support assessment of T-AO 205 capabilities in FY23. However, the Navy did not complete IOT&E due to the lack of ships available to support several required test events. DOT&E will report on T-AO 205 operational effectiveness, suitability, and survivability in FY24 upon completion of IOT&E.

SYSTEM DESCRIPTION

The T-AO 205 *John Lewis*-class of fleet replenishment oilers replaces the 15 ships in the T-AO 187 *Henry J. Kaiser* class. The T-AO 205 is 746 feet long, has a full load displacement of 49,850 metric tons, and can attain a maximum speed of 20 knots. T-AO 205 has eight connected refueling stations (three delivery to port, two delivery and three receiving to starboard), one astern fuel delivery station, two connected cargo transfer stations (one to port and one to starboard), and a vertical replenishment station from the flight deck.

The T-AO 205 has an advanced degaussing system, the Nixie torpedo countermeasure system, and nine mounts for an embarked security team to mount their machine guns. The ship has the space and weight reservations for, but no installed defensive weapons systems. The T-AO 205 is designed to commercial standards for a crew of 95 civilian mariners with additional accommodations for up to 34 personnel.

MISSION

Combatant commanders will use T-AO 205 to replenish ships within carrier strike groups and expeditionary strike groups during peacetime and combat operations. T-AO 205 will serve as the primary logistics platform linking Navy ships and embarked aircraft with logistics nodes ashore. T-AO 205 delivers fuel, food, supplies, and spare parts.

PROGRAM

The T-AO 205 is an Acquisition Category IB program and achieved Milestone B/C in September 2017. The FY19 Annual Long-Range Plan for Construction of Naval Vessels increased the T-AO 205 class to 20 ships. Assistant Secretary of the Navy for Research, Development, and Acquisition increased low-rate initial production (LRIP) to 12 ships in June 2022.

General Dynamics, National Steel and Shipbuilding Company (NASSCO) delivered T-AO 205 in July 2022 and T-AO 206 in July 2023. Four ships (T-AO 207 through T-AO 210) are under construction.

DOT&E approved the Test and Evaluation Master Plan Revision 1 in September 2021.

» MAJOR CONTRACTOR

- General Dynamics NASSCO – San Diego, California

TEST ADEQUACY

The Navy commenced IOT&E in 3QFY23 aboard USNS *John Lewis (*T-AO 205) during its post-delivery test and trials period. Testing was in accordance with DOT&E-approved test plans but was incomplete due to unavailability of all ship types that the T-AO 205 is designed to replenish and reduced crew manning. The Navy demonstrated 8 of 23 replenishment events in the operational test design and repeated several of these events for seven supplemental events. The Navy has yet to demonstrate replenishment of amphibious-class ships including LHDs, LHAs, LPDs, and LSDs.

Tests focused on the delivery of fuel and cargo, as well as communications, damage control, mobility, replenishment, self-defense, and system reliability. The Navy has yet to demonstrate simultaneous operation of five connected replenishment stations and conduct operationally relevant vertical replenishment of dry cargo onboard the T-AO 205 class.

The Navy evaluated cyber survivability of T-AO 205 in 3QFY23. Testing to assess T-AO 205's cyber survivability posture and the crew's ability to conduct their mission in a cyber-contested environment was conducted in accordance with the DOT&E-approved test plan and observed by DOT&E.

The Navy completed acoustic trials in January 2023 and underwater electromagnetic trials in March 2023 on USNS *John Lewis* as part of developmental testing. Data from this testing will be leveraged to support LFT&E assessment of the likelihood that the class will set off naval mines as well as determining safe passage depths for unswept routes.

As part of LFT&E assessment of the class, the Navy completed Total Ship Survivability Trials (TSST) in July 2023 aboard USNS *John Lewis*. The TSST

simulated three different weapon hits against USNS *John Lewis* to exercise the ship's damage control and recoverability capabilities to combat primary and secondary damage.

The results from TSST will be used to assess ship recoverability and update modeling and simulation (M&S) to reflect observed functionality of T-AO 205 systems. Completion of the LFT&E survivability assessment of the class requires the Navy to complete verification, validation, and accreditation (VV&A) of the survivability M&S, including the Advanced Survivability Assessment Program (ASAP).

PERFORMANCE

» EFFECTIVENESS

Insufficient data are available to determine operational effectiveness of T-AO 205 due to testing being incomplete. To date, the T-AO 205 has demonstrated the ability to deliver fuel and cargo to several ship classes including the CVN 68 class, DDG 51 class, CG 47 class, DDG 1000 class, and LCS 2 class and also demonstrated the ability to deliver and receive fuel from another combat logistics ship during consolidation operations. Ship propulsion, damage control, communications, and auxiliary systems supported all observed operations.

» SUITABILITY

Insufficient data are available to determine operational suitability of T-AO 205 due to testing being incomplete. However, USNS *John Lewis* could not support scheduled test events on five occasions due to equipment failures.

» SURVIVABILITY

DOT&E is conducting analysis of the cyber survivability data collected on T-AO 205 and will provide a classified report in FY24.

Because the Navy has yet to complete LFT&E analyses, survivability assessment of T-AO 205 is not yet possible. DOT&E expects sufficient data to be collected by 2QFY24, but the Navy must complete VV&A of survivability M&S to support assessment. The T-AO 205 TSST identified findings previously not determined through survivability M&S. The Navy expects to deliver a TSST report and a Final Survivability Assessment Report in FY24.

RECOMMENDATIONS

The Navy should:

1. Complete the remaining IOT&E events to include simultaneous vertical and underway replenishment and simultaneous operation of five connected replenishment stations.
2. Complete the VV&A of the survivability M&S to support the Final Survivability Assessment Report.
3. Evaluate and correct causes of system reliability failures on T-AO 205 ships.
4. Complete the T-AO 205 TSST Report and Final Survivability Assessment Report.