Consolidated Afloat Networks and Enterprise Services (CANES)

Previous testing ending in 2017 demonstrated the Consolidated Afloat Networks and Enterprise Services (CANES) to be operationally effective and suitable for surface ships, and survivable for smaller ships such as cruisers and destroyers, but not for larger ships such as aircraft carriers and large-deck amphibious ships. The Navy Operational Test and Evaluation Force (OPTEVFOR) and the program office worked with the fleet to find a test submarine for the CANES submarine variant. Their combined effort resulted in conducting a useful cyber survivability test. The Navy is continuing to look for a submarine to finish the FOT&E of the CANES submarine variant.

SYSTEM DESCRIPTION

CANES is an enterprise information system consisting of computing hardware, software, and network services (i.e., phone, email, chat, video teleconferencing, web hosting, file transfer, computational resources, storage, and network configuration and monitoring).

The CANES network provides a single, consolidated physical network with logical sub-networks for Unclassified, Secret, Secret Releasable, and Top Secret security domains. It includes a cross-domain solution for information transfers across these security boundaries. This consolidation reduces the network infrastructure footprint on naval platforms and the associated logistics, sustainment, and training costs.

CANES has three variants tailored to the employing platform: unit-level for smaller ships such as destroyers and cruisers, force-level for large deck ships such as aircraft carriers and large deck amphibious ships, and a submarine variant.

MISSION

Navy shipboard users use CANES to:

- Host their applications on computing resources and network services in support of naval and joint operations.
- Support weapon systems, command and control, intelligence, and business information applications.
- Communicate via chat, email, voice, and video.

PROGRAM

In a July 2015 IOT&E report, DOT&E evaluated CANES for unit-level ships to be operationally effective, suitable, and survivable. The USD(AT&L) (restructured in 2018 into USD(A&S) and USD(R&E)) approved full deployment of CANES in October 2015. The full deployment acquisition decision memorandum delegated milestone decision authority to the Secretary of Navy, and designated CANES an Acquisition Category IAC program. The Navy tested unit-level and force-level ships in accordance with DOT&E-approved test plans, both in 2015. The Navy initially expected an FOT&E of the submarine variant during 2019, but the test was cancelled and rescheduled multiple times because the submarines designated for testing had to be deployed to support operational requirements.

» MAJOR CONTRACTORS

- BAE Systems, Inc. – Rockville, Maryland
- DRS Laurel Technologies – Johnstown, Pennsylvania
- Global Technical Systems – Virginia Beach, Virginia
- L3Harris Technologies, Inc. – Camden, New Jersey
- Leidos – Reston, Virginia
- Peraton, Inc. – Herndon, Virginia
- Serco – Herndon, Virginia
- Milcom – Virginia Beach, Virginia

TEST ADEQUACY

In early 2QFY23, a *Los Angeles*-class submarine became available when an unscheduled 10-day availability window occurred. Because of the small availability window, OPTEVFOR recommended focusing on cyber survivability testing rather than a full operational test, since the submarine variant of CANES had performed well in prior developmental tests and CANES has been used effectively on surface ships and submarines for many years. DOT&E approved the cyber survivability test plan in January 2023.

OPTEVFOR conducted and DOT&E observed the CANES cooperative vulnerability and penetration assessment (CVPA) and adversarial assessment (AA) in January and February 2023. Given the shortened test window, the cyber test team and DOT&E agreed that the Top Secret/Sensitive Compartmented Information (TS/SCI) enclave should take priority, because the TS/SCI enclave had not been tested in prior CANES cyber survivability tests.

However, while preparing for the cyber test, the test team learned that submariners do not use CANES for TS/SCI traffic. Instead, crews use carry-on temporary equipment (Lime Rock) to access

SCI traffic. When OPTEVFOR found out, they recommended still continuing with the test as planned, because the TS/SCI enclave was not tested in previous CANES testing of any variant and the force-level ships do use the CANES TS/SCI enclave. DOT&E agreed with the recommendation.

In preparation for when a submarine will become available, the Navy prepared an FOT&E test plan, which DOT&E approved in May 2023.

PERFORMANCE

» EFFECTIVENESS

The CANES submarine variant was not tested for operational effectiveness, but CANES for both the unit-level and force-level versions were previously found to be operationally effective. Additionally, Application Integration System Integration Test events for systems hosted on CANES have consistently showed that CANES provides effective network services.

» SUITABILITY

The CANES submarine variant was not tested for operational suitability, but CANES for both the unit-level and the force-level versions were previously found to be operationally suitable.

» SURVIVABILITY

While the execution of the CVPA and AA events were not sufficient for a comprehensive evaluation due to limited platform availability, the tests identified several vulnerabilities that need to be mitigated. When the Navy identifies a test submarine for FOT&E, OPTEVFOR should conduct an FOT&E that includes an adequate CVPA and AA.

RECOMMENDATIONS

The Navy should:

1. Fix the vulnerabilities discovered during the CVPA and AA as reported by the OPTEVFOR in March 2023.

2. Identify a test submarine to complete the FOT&E.