# Lockheed Martin Demonstrates Improved Human Alerting Capability For U.S. Navy

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CHERRY HILL, N.J.

Lockheed Martin and its multi-industry and government team successfully demonstrated an innovative alerting system that increases by 25 to 85 percent a naval warfighter's ability to perform more effectively during periods of alert-based interruptions.

Sponsored by the Office of Naval Research as a Future Naval Capability, the Human Alerting and Interruption Logistics-Surface Ship (HAIL-SS) system is a reusable, open-architecture, software component that maximizes human performance during interruptions. Designed for Navy console operators, HAIL- SS mediates between operators and the various mechanisms that generate alerts, including the Aegis Display System, Weapons Control System, and SPY Radar. It automatically creates meaningful announcements of alerts, negotiates services that leverage an operator's cognitive talent to manage quick shifts in attention, and provides context recovery to improve an operator's performance when resuming tasks following alerts.

During the program's final demonstration, the team successfully demonstrated Technology Readiness Level 7 with HAIL-SS fully integrated on an AN/UYQ-70 console and an Aegis Baseline 7, Phase 1, weapon system. The demonstration occurred at Lockheed Martin Advanced Technology Laboratories, Cherry Hill, NJ, and the Combat System Engineering and Test Center Laboratory, Moorestown, NJ.

The demonstration applied HAIL-SS to the console of an Aegis Identification Supervisor for anti-air warfare, and it presented operators with an underway battlespace containing up to 60 tracks, including aircraft and surface ships. The scenario presented typical high-frequency alerts, including link-conflict action, ship-element-status change, conflict resolved, and information-only messages. In each case, operators were better able to manage alerts and maintain a more efficient tactical picture.

"I am quite impressed with HAIL's capability and completely satisfied with the team's performance. Not only is the program on budget, but also ahead of schedule," said B.J. Ramsey, then HAIL-SS program manager, Office of Naval Research. "The next step for HAIL-SS is to transition it out of the laboratory and into the fleet, where it will positively impact the Navy's command and control programs."

The HAIL-SS final demonstration followed an equally successful Phase-2 Evaluation three weeks earlier at the Aegis Training and Readiness Center, Norfolk, Va., where eight highly experienced Aegis trainers and six active duty Operations Specialists performed a high-fidelity operational scenario using 250 tracks with and without the system. All 14 participants said that they "would definitely use HAIL-SS" in real operations.

Dr. Daniel McFarlane, Lockheed Martin's HAIL-SS principal investigator, originated HAIL in 1995 as a research project while an employee of the Naval Research Laboratory, Washington, D.C. Later as an employee of Lockheed Martin Advanced Technology Laboratories, he proposed and received funding in 2002 to develop the technology under ONR's Knowledge Superiority and Assurance Future Naval Capabilities program. Since that time, the team and he have developed HAIL-SS through technology readiness levels three through seven.

Lockheed Martin Advanced Technology Laboratories leads a team that includes Lockheed Martin Maritime Systems and Sensors-Moorestown, Computer Sciences Corporation, Basic Commerce and Industries, and Naval Research Laboratory. The Combat Systems Engineering Development Site and Aegis Training & Readiness Center provide support on a not-to-interfere basis.

Headquartered in Bethesda, Md., Lockheed Martin employs about 130,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services.

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