



TOPIC NUMBER: N151-036

SBIR INVESTMENT: \$1,278,015

PHASE III FUNDING: \$22,726,544

DEPARTMENT OF THE NAVY

NAVY SBIR/STTR SUCCESS STORY



NEXT GENERATION ELECTRONIC WARFARE HUMAN MACHINE INTERFACE (HMI) FOR SUBMARINES

Progeny developed an HMI for EW systems on submarines that increases situational awareness, improves threat assessment, and reduces operator workload.

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THE CHALLENGE

The Navy is interested in upgrading machine-to-operator interfaces on the increasingly-complex EW systems on its submarines. The system needs to provide easy integration with new applications and features to increase operator functionality without increasing the operator/system interaction time. Operators need to interact quickly with the system and accurately see the electromagnetic environment, to quickly process data for decision-making and increased situational awareness.

THE TECHNOLOGY

A modular, extensible, and open Human Machine Interface (HMI) for the submarine's AN/BLQ-10 electronic warfare (EW) system. The purpose of this HMI is to allow the EW operator to intuitively interact with the Radio Frequency (RF) environment and reduce the operators' manual interaction with the system. This results in faster safety and threat assessments, and a more efficient means to conduct RF signal analysis. It also significantly improves emission classification and correlation.

THE TRANSITION

With a successful Phase II under its belt, Progeny was awarded a Phase III fixed-price incentive (firm target), cost-plus-fixed-fee, and cost only contract for Navy systems engineering services. This contract includes options, which, if exercised, would bring the cumulative value of this contract to \$81,944,297. The company is working with the Navy on developing a Next Generation EW HMI for submarines to determine its effectiveness in an operationally relevant environment. The Naval Sea Systems Command, Washington Navy Yard, District of Columbia, is the contracting activity.

THE NAVAL BENEFIT

The solution resulted in improved operational performance, increased situational awareness, and reduced operator workload. The modularity of the design enabled integration of existing applications with ease. Other key benefits included improved emitter contact management with database driven platform correlation, enhanced data visualization and an interface for emitter data record/review/playback control. The new HMI modules produced a way to consume and display organic and inorganic data, including processed answers, raw digital sets, continuous digital intermediate frequency, burst digital IF, and In-phase/Quadrature data.

THE FUTURE

The technology is applicable across all EW platforms in the Navy. There is potential for other service/agency EW systems to utilize these improved HMIs. Commercially, the technology is applicable in the telecommunications and information technologies industries, and specifically with any RF mapping technologies, emitter detection and classification displays. Progeny Systems has a history of successfully transitioning SBIR-funded technologies to the fleet. Just recently, the firm was awarded a \$14M Phase III contract from NAVSEA to provide engineering and technical services for Navy submarines and aircraft carriers via the software infrastructure and build process related to a maintenance management tool. This contract stemmed from SBIR Topic N05-051 - Integrated Shipboard and Shore-based Maintenance Management Decision Tool.