TOPIC NUMBER: N02-039 | **SBIR INVESTMENT: $1,593,296** | **PHASE III FUNDING: $36,900,000**

ADEPT DISTANCE SUPPORT SENSOR SUITE (ADSSS) FOR MK-99 FCS

Mikros Systems leveraged the Navy's SBIR program to develop a suite of standardized test equipment and testing processes, resulting in increased collaboration, more interactive training, and reduced costs.

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THE CHALLENGE

Information and data acquisition technologies have been demonstrated as useful tools in the acquisition, storage, transmission and analysis of complex electronic systems. As such, the Navy sought statistical analysis tools that utilize data acquired during critical or complex procedures, with the goal of supporting decision-making processes and reducing analysis time and work effort. This technology would result in alignments and analyses with tolerances that cannot be consistently achieved with manual processes, which, in turn, would improve system performance and reduce downtime.

THE TECHNOLOGY

When Mikros first responded to the Navy's need, the company developed a Multiple Function Distributed Test and Analysis tool that focused on the standardization of test equipment and testing processes, using modern software techniques and providing a foundation for new methods of system maintenance, alignment, fault detection and isolation. This project focused on more efficient and effective use of technical manpower through increased automation, distance support and interactive training. The company used the AN/SPY-1 Aegis radar as the testbed to accomplish several objectives, including an automated smart capability for troubleshooting and repair; a data collection capability for alignment and maintenance efforts; improved alignment and calibration time; an interactive capability for distance support; and an interactive training capability. After successful Phase I and II projects, this technology evolved into Mikros' ADEPT Distance Support Sensor Suite (ADSSS), which was geared toward the Navy's MK 99 fire control system on Aegis platforms.

THE TRANSITION

Although the first Phase III contract relating to this SBIR topic came 10 years ago, additional options and follow-on contracts continue to come in, resulting in over $36.9M in revenue.

Mikros first completed the ADEPT system installation on the U.S. Navy's USS Independence (LCS 2) littoral combat ship. The ADSSS system used an advanced model-based prognostics framework technology that monitored combat system elements in order to detect and predict on-ship system failures, as well as apply predictive analytics to onshore systems to detect broader maintenance trends and patterns across the fleet. Shortly thereafter, Mikros was acquired by McKean Defense, and subsequently, Noblis. Today, Noblis still produces ADEPT, and it features smart sensors, model-based prognostics and secure fault-tolerant networking to implement condition-based maintenance (CBM) for mission-critical complex distributed systems.

THE NAVAL BENEFIT

Mikros' technology increased readiness through reduced maintenance downtime and increased system reliability through predictive failure analysis and proactive remediation. This resulted in a more efficient and effective use of technical manpower through increased automation, distance support and interactive training. Benefits for the Aegis fleet include increased operational availability of the MK 99 fire control systems and the other combat system elements which use the MK 99, and the improved maintenance of the MK 99 system. Smart sensors enable flexible, scalable, extensible data collection and fault-tolerant networks, while model-based prognostics turn vast amounts of data into actionable information for operations, maintenance and logistics.

THE FUTURE

Noblis continues to develop and manufacture the ADEPT Distance Support Sensor Suite for the U.S. Navy. The company has evolved its technology to include reliability centered maintenance (RCM) and remote maintenance monitoring (RMM), which are increasingly recognized as essential techniques for minimizing the life-cycle cost of maintaining complex distributed systems, such as those used in the Navy's defense systems.

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