Department of the Navy SBIR/STTR Transition Program

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NAVSEA #17-589

Topic # N141-030
Sense and Respond Technology Enabling Condition Based Maintenance (CBM)
Qualtech Systems, Inc.

WHO

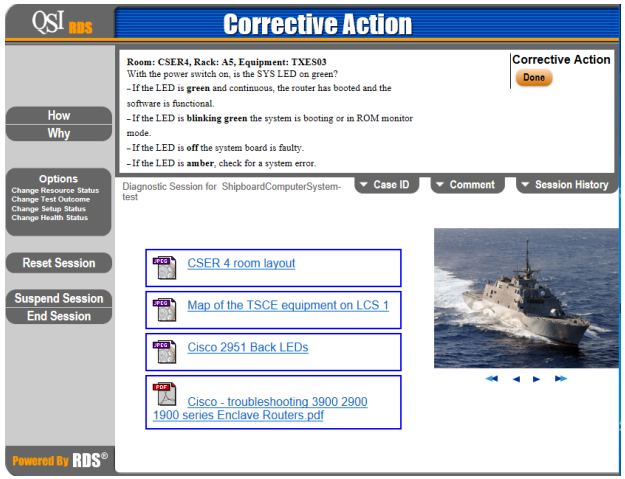
SYSCOM: NAVSEA

Sponsoring Program: PMS 505 Dedicated Fleet Introduction

Transition Target: Littoral Combat Ship (LCS) Total Ship Computing Environment (TSCE)

TPOC:
(202)781-0592

Other transition opportunities: The best applications for this CBM+ technology are in Navy's surface and sub-surface vessels' on-board Information Technology (IT) networks. The technology is relevant for the NAVSEA Engineering for Reduced Maintenance (ERM) program. QSI is also working directly with Lockheed Martin for technology transition.



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Notes: The image is a screenshot of the Guided Troubleshooting application designed for the on-board IT crew as part of the CBM+ solution. The application instructs the crew step-by-step through a degradation or failure-specific sequence of troubleshooting steps that the crew can perform, and includes multimedia, Cautions and Warnings and related information.

WHAT

Operational Need and Improvement: The Littoral Combat Ship (LCS) was designed to operate with a significantly smaller crew size than would be expected from a traditional manning concept. Effective utilization of CBM has been identified as a class-wide requirement for LCS for managing the ship infrastructure. The Total Computing Ship Environment (TSCE) network, the transition target of this technology, forms part of the key shipboard infrastructure.

Specifications Required: The technology, as part of the Total Ship CBM solution, will analyze, reduce, transmit, and display shipboard data from the TSCE computing hardware thereby allowing the shipboard crew and, as needed, the shore-based SME to make better decisions by improved information sharing and effect repairs more rapidly for onboard IT network equipment.

Technology Developed: QSI's TEAMS based software solution will bring the CBM capability to the TSCE and other onboard networks and form part of the Total Shipboard CBM solution. TEAMS will deliver system health data in an actionable format to shipboard Information Technology (IT) crew for proactive and predictive maintenance. It will also provide troubleshooting intelligence to the shore based Subject Matter Experts (SMEs) for providing effective technical support to the shipboard IT crew and help bridge the gap between the warfighter and the SME. The final product will be a complete sense and respond system that works on both LCS variants and allows the sailor and shore-based SMEs to prevent system faults and improve the availability of on-board Combat Systems computing resources.

Warfighter Value: The key benefit to the warfighter from effective deployment of this technology will be to reduce the overall impact from shipboard IT infrastructure maintenance and help the sailor remain focused on warfighting related tasks. By enabling CBM through proactive and predictive maintenance, the TEAMS based solution will improve critical IT infrastructure equipment operational availability, sustainability, performance and help cyber readiness and thus support the mission and aid its success.

WHEN

Contract Number: N00024-16-C-4046 **Ending on:** May 11, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Integration testing at Lockheed Martin's (LM) LITF (Land Integration & Test Facility) lab	Med	Ability to integrate the TEAMS software with the LITF lab's TSCE network for receiving and analyzing network data	4	July 2017
Initial demonstration using LM's LITF lab	Med	Effective health monitoring and guided troubleshooting for select failure scenarios	5	September 2017
Comprehensive demonstration of CBM using LM's LITF lab	Med	Effective CBM for a comprehensive set of failure scenarios based on Navy's shipboard logs	6	March 2018
Shipboard demonstration of CBM on LCS	Med	Integration and operation with the TSCE network onboard a specific LCS	8	December 2018

HOW

Projected Business Model: QSI is the commercial provider of the TEAMS (patented and registered) health monitoring and diagnosis software and its associated modules. We intend to directly license the CBM module as part of the TEAMS software suite and provide associated software training and integration services. We intend to direct sell the TEAMS core software to the Government and provide the CBM module to the Government as part of the overall product suite. Alternatively, sales and integration through a system integrator such as Lockheed Martin and General Dynamics will also be pursued.

Company Objectives: The Forum for SBIR/STTR Transition (FST) forum will lead to the opening up of technology demonstration and marketing opportunities for QSI's TEAMS software suite. We believe that the addition of CBM capability to the TEAMS software suite will lead to significant opportunities with various DoD and NASA platforms which seek to deploy or add proactive and predictive maintenance to their systems. Partnering with Lockheed Martin and General Dynamics will facilitate system integration and deployment of the TEAMS CBM technology onto various Navy ships and sub-surface platforms.

Potential Commercial Applications: Existing Network Performance Monitoring and Diagnostics (NPMD) tools such as HP, CA, SolarWinds, BMC Software primarily focus on network monitoring and failure detection in the forms of alerts and alarms. Most do not offer true diagnostics, root cause failure determination and prognostics, and require IT experts to analyze the alarms/logs and network data for troubleshooting. QSI's TEAMS CBM solution for networks intends to bridge that gap by leveraging its intelligent reasoning and failure prediction technology that has already found success with NASA and commercial customers in the aerospace, semiconductor and medical device markets.

Contact: Robert Ticknor, VP, Business Development and Chief Evangelist
bob@teamqsi.com (916) 616-7134