Navy SBIR/STTR Success

Machinery Health Monitoring for Shipyard Productivity

Impact Technologies' CBM+ system for shipyard capital assets (e.g., cranes, dry docks) addresses uptime, productivity, and safety while optimizing overall facilities maintenance costs.

Topic Number: N03-105

SBIR Investment:
$829,918

Phase III Revenue:
$2,877,899

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About the Technology:

Shipbuilding and repair process of ships are negatively affected by unanticipated machinery functional failures in shipyard capital assets. Periodic inspections, preventive maintenance, and machinery health assessments are conducted by maintainers and operators, addressing some potential failure modes. Current maintenance practices often sub-optimize planned and unplanned asset downtime. As part of DoD's CBM+ strategy, which includes Reliability Centered Maintenance (RCM) engineering to identify dominant failure modes, Impact Technologies' answer is the focused application of its SxNAP hardware/ software platform–configured to monitor capital asset health and usage to enable applicable and effective maintenance actions. This capability has been applied to naval shipyard cranes and dry dock assets. The SxNAP product line provides real-time data to enable evidence-based maintenance decisions in the eFEM/MAXIMO asset management system.

Naval Benefit

The SxNAP series of devices are designed to interface with (via XML formatted messaging) any third party asset monitoring / management application, including eFEM, ICAS, and other asset management and data historian systems. Onboard processing reduces network bandwidth requirements and results in near real-time information that is readily expandable. XML messaging enables open architecture implementation with its associated benefits. Capability enables operators, engineers, senior managers and headquarters staff to have visibility into the utilization of key assets such as cranes to aid decision–making regarding operations, repair-capitalization or disposal of capital assets.

Transition

Development of the SxNAP series of devices was funded by various Navy SBIR topics. N03-105 specifically funded the application and test of SxNAP technology in the shipyard environment, to include a web-interface, expanded channel capability (from 8 to 24), and wireless (secure WiFi and cellular) communications options. S2NAP, attached to a mobile Grove crane at Northrop Grumman Ship Systems Pascagoula shipyard, was among the first successes post-Hurricane Katrina – reporting a clogged air filter, via cellular connection, to Northrop Grumman engineers in Newport News, VA.

The shipyard solution developed under N03-105 and other supporting SBIR topics evolved into the Wireless Equipment Monitoring and Control System (WEMACS). The WEMACS system consists of a set of S2NAP hardware devices and attached sensors (e.g. accelerometers, tachometers, current sensors) fitted as LRUs to shipyard assets such as cranes and dry dock pumps.

Based on Impact Technologies' success as a small business and multiple subsequent contracts with ONR, NAVSEA, and NAVAIR, the company was acquired in 2011 by Sikorsky Aircraft Corporation and is now known as Impact Technologies, A Sikorsky Innovations Company.

Impact Technologies (A Sikorsky Innovations Company)

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