Innovative Cable Installation Solutions to Save Labor and Costs in VCS Construction

Status: Partial Implementation

PROBLEM / OBJECTIVE

During ship construction, the installation of electrical cable, or cable pulling, is an expensive, labor-intensive, and injury-prone operation. General Dynamics Electric Boat (EB) researched commercially available equipment to assist with cable installation, but it was not conducive for VIRGINIA Class Submarines (VCS) due to the cable routing configurations and confined areas aboard ships. This Navy Metalworking Center (NMC) project developed innovative solutions that will reduce labor costs and injury claims associated with the installation of electrical cables in VCS.

Improved cable pulling processes in VCS construction will reduce labor hours as well as injury claims and medical costs. EB photo

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

NMC worked with EB personnel to develop and progressively improve a collection of non-mechanized tools to facilitate cable routing activities at the EB shipyards. The tools include rollers, hooks and slides on adjustable handles, and custom low-friction slides that clamp on cable hangers, coamings and wire ways. In general, these small, easy-to-use, lightweight, and portable tools improve cable routing practices, help workers manipulate and/or guide the cables, and reduce friction during routing operations. In addition, EB investigated modifications to the current method of purchasing cable for lighting installations as a means to reduce the amount of scrap cable.

Implementation and Technology Transfer:

Quotations to fabricate the developed tools have been solicited and documented for shipyard use. Vendors will incorporate tool modifications requested by the shipyards as they gain additional experience using the tools. EB purchased 10 stuffing tube rollers for use at its Groton and Quonset Point facilities during the construction of SSN 789 in the first quarter of FY14. Full implementation at EB will be realized on SSN 791. Beyond EB, General Dynamics Bath Iron Works ordered an assortment of 84 low-friction hand tools, which were delivered in July 2016. Implementation is also expected at Ingalls Shipbuilding (Ingalls) and Newport News Shipbuilding, and on-site tooling demonstrations were conducted at the shipyards to support technology transition and cost savings opportunities for the Navy.

Expected Benefits and Warfighter Impact:

EB trade personnel and the foremen who oversee cable routing activities are confident that a labor hour reduction of 10% to 20% is achievable with the developed tools. This equates to a total cost avoidance of $242K- $484K per hull. EB will update the cost savings estimate as the tools are implemented and performance data are collected. EB believes that an additional savings of $39K to $51.5K per hull may be realized by implementing changes to the method used to purchase electrical lighting cable.

In addition, via an opportunity identified by another Navy ManTech Center of Excellence, the Electro-Optics Center, Ingalls conducted an independent time study that indicated an approximate 40% time savings when routing fiber optic cables using the developed tools.

TIME LINE / MILESTONE

Start Date:	June 2012
End Date:	December 2013

FUNDING

Navy ManTech Investment:	$980K

PARTICIPANTS

PMS 450
EB
NMC

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