

Mechanized Tools to Reduce Labor for Pulling Cable on Surface Ships

Status: Implemented

PROBLEM / OBJECTIVE

It can take up to 25 workers to pull a single cable on a surface ship, depending on the cable size, length, and routing path. The workers grasp the cable and verbally communicate to coordinate the pulling effort. The cable is moved several inches at a time until it's in the desired position. Depending on the cable length and type of pull, the workers may pull an entire length of cable simultaneously, pull portions of the cable short distances at a time, or most commonly, pull the cable from the middle of the run, in both directions, as opposed to the cable being pulled completely from one end. In addition, the workers often pull the cable from poor ergonomic positions due to lack of space and cable access. This Navy Metalworking Center (NMC) project developed easy-to-use, small, lightweight, portable, power-assisted tools to reduce the amount of time and effort required to pull cable.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The project team developed two mechanized tools that increase efficiency and greatly reduce the physical demand on tool operators. The air-powered dual roller tool weighs 26 lbs. and is designed to pull cables 1.5 in. to 2.25 in. in diameter with a force up to 450 lbf. With slight modifications, this tool can be adapted for use with cable as small as 0.5 in diameter. The electric capstan tool weighs 29 lbs. and has a maximum cable-pulling force of 2,000 lbf. without cable size limitations.

Implementation and Technology Transfer:

The prototype tools were initially implemented by Ingalls to install cables on DDG 113 (February 2015) and DDG 114 (June 2015). The final prototype tools were transitioned to Ingalls in November 2015 and implemented during installation of cables on LHA 7 in February 2016. Ingalls is purchasing 12 production capstans for delivery in September 2016. In addition, Ingalls intends to procure three more capstans and 15 dual rollers in 2017. BIW purchased one capstan and one dual roller for use on DDG 116 in April 2016 and expects to purchase additional tools as its proficiency in using the tools increases. Newport News Shipbuilding plans to evaluate one capstan and one dual roller for CVN applicability when cable installation opportunities begin on CVN 79; this will provide a significant representative sampling quantity for applicability and labor-hour comparisons in order to confirm that the tools meet expectations for that program.

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Tools developed under this project will reduce labor as well as health and safety issues associated with shipboard cable pulling.



Pictured are the capstan (left) and dual roller (above) tools. NMC photos

Expected Benefits and Warfighter Impact:

- Ingalls anticipates that this project will result in a 20% labor savings when using the tools to install Class III and Class IV cables on LHA, LPD, DDG and National Security Cutter (NSC) class ships.
- This labor hour reduction equates to a total estimated cost savings of approximately \$1.5M, and is based on using the cable-pulling tools on a single hull of each of the programs under construction at Ingalls.
- Additional cost savings are anticipated due to reduction in medical claims.

TIME LINE / MILESTONE

Start Date: March 2014
End Date: November 2015

FUNDING

Navy ManTech Investment: \$1.6M

PARTICIPANTS

LHA Program Office	DDG 51 Program Office
LPD Program Office	CVN Program Office
Ingalls	NAVSEA 05Z
NNS	ONR Navy ManTech
NMC	

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