Navy Metalworking Center Project Team Identifies Methods to Improve Grit Blasting Process

Status: Pending Implementation

PROBLEM / OBJECTIVE

Grit blasting is the most common method of surface preparation in shipbuilding, and there are opportunities to make grit blasting and the associated processes more efficient. Proper surface preparation prior to coating application is critical for coating longevity. The baseline practice at General Dynamics Electric Boat (EB) and Newport News Shipbuilding (NNS) in Virginia Class Submarine construction was to wrap the piping, blast the surface, remove the wrapping, clean the piping, and rewrap the piping prior to painting. A Navy Metalworking Center (NMC) Integrated Project Team (IPT) conducted a series of trials to optimize the grit blasting parameters. These trials leveraged the results of previous studies and included various combinations of parameters such as variations of blast media type, blast media size, nozzle angle, and nozzle type. The IPT also looked at the associated processes of pipe wrapping and unwrapping.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The IPT developed and evaluated several improved pipe wrapping and unwrapping methods that have been well received by both the IPT and the naval shipyards. Neoprene rubber held in place with hook-and-loop fasteners can be installed and removed very quickly and can be reused. 3M Impact Stripping Tape results in a smooth surface that can eliminate the need to unwrap to remove grit dust and then rewrap to protect during painting. 3M Cold Shrink End Caps are a very fast method for protecting valves and gages. 3M Aerospace Adhesive Removal Discs rapidly cut through rubber and tape without scoring the steel piping. The IPT also developed improved grit blasting parameters that reduced grit blasting time by up to 25 percent. This was primarily accomplished by using modern extra-long venturi nozzles.

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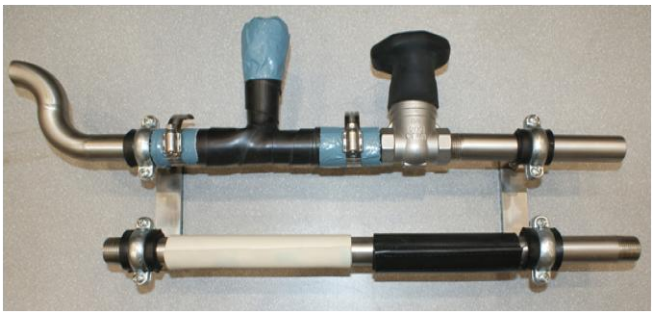

Improvements to pipe wrapping when blasting structural steel on submarines have been identified and implemented. NMC photo

Implementation and Technology Transfer:

The recommendations developed during this project will be implemented for the construction of SSN 787 in September 2012 at EB and NNS. Portsmouth Naval Shipyard has already implemented Cold Shrink End Caps and the Aerospace Adhesive Removal Discs. Project results can also apply to almost all ship classes.

Expected Benefits and Warfighter Impact:

- The results of this project are expected to save approximately $350K per hull in reduced labor, materials, and disposal cost. The majority of these savings are the result of reducing the labor associated with wrapping pipes prior to blasting.
- Pipe wrapping and removal processes developed by the project team are expected to reduce wrapping and unwrapping labor by 60 percent.
- Improved grit blasting processes are expected to reduce grit blasting labor by up to 25 percent.

TIME LINE / MILESTONE

Start Date:	May 2010
End Date:	March 2012

FUNDING

Navy ManTech Investment:	$610K

PARTICIPANTS

PMS 450
Naval Surface Warfare Center, Carderock Division
EB
NNS
NMC