

# Improved Abrasive Technology to Reduce VCS Construction Labor Costs

Status: Pending Implementation

## PROBLEM / OBJECTIVE

Recent advancements in abrasive technologies have greatly improved productivity in many industries, but these advancements cannot be transferred easily to nuclear shipbuilding due to stringent regulation and control of support material. The use of improved abrasives in Virginia Class Submarine (VCS) construction can result in significant savings associated with decreased labor, improved abrasive life, and reduced fatigue due to less vibration. The objective of this Navy Metalworking Center (NMC) project was to ensure that industry can manufacture abrasives that have improved properties and meet cleanliness and detrimental material requirements associated with nuclear shipbuilding.

## ACCOMPLISHMENTS / PAYOFF

### **Process Improvement:**

The project team successfully segregated abrasive products for nuclear and non-nuclear work at General Dynamics Electric Boat (EB). This segregation enables the use of commercially available improved abrasive products on >90% of the boat. The project evaluated several bonded and coated abrasive products from various vendors to determine which ones offered the greatest potential to reduce labor associated with abrasive operations. These evaluations included a representative matrix of ship construction materials in order to determine optimal abrasive life and efficiency as well as operator vibration exposure.

### **Implementation and Technology Transfer:**

Implementation will be initiated in calendar year 2014 when EB purchases improved abrasives in support of SSN 786 construction. All baseline abrasives on hand will be consumed prior to full implementation of the advanced abrasives. EB personnel will be trained to recognize which abrasives can be used on nuclear hardware (workpiece) material.

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Implementation of improved abrasive technologies will allow shipbuilders to remove material faster, resulting in construction cost savings. NMC photo

### **Expected Benefits and Warfighter Impact:**

Improved abrasive technologies will allow shipbuilders to remove material faster, with less fatigue and better hygienic conditions. Cost savings are estimated to be \$758K per hull, which includes a weighted average derived from improvements on all of the hardware, a 62% improvement in productivity, and an almost four-fold increase in abrasive life. Additional benefits may be realized for overhaul activities.

## TIME LINE / MILESTONE

Start Date:	February 2012
End Date:	September 2013

## FUNDING

Navy ManTech Investment:	\$633K
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## PARTICIPANTS

Virginia Class Program Office (PMS 450)  
Naval Surface Warfare Center, Carderock Division  
General Dynamics Electric Boat  
Navy Metalworking Center