

# Electric Boat Begins Implementing Work Cell Technologies for Hanger Production

**Status:** Pending Implementation

## PROBLEM / OBJECTIVE

The Navy Metalworking Center (NMC) conducted a Navy ManTech project that will streamline the production of hangers used in construction of naval submarines at General Dynamics Electric Boat (EB). Manufacturing processes at the EB Hanger Shop currently rely heavily on manual operations in a congested work environment. The Integrated Project Team (IPT) developed and is working toward implementing automated or mechanized technologies supporting a work cell approach that will result in improved efficiencies and added throughput within the EB Hanger Shop.

## ACCOMPLISHMENTS / PAYOFF

### **Process Improvement:**

The IPT assessed the hanger fabrication processes at EB and down-selected part families and target areas for mechanization and/or automation of these processes. NMC and EB then developed several concepts for implementing a work cell approach and manufacturing improvements for the selected target areas. Specifically, the IPT developed an improved shop layout featuring dedicated work cells using ergonomic technologies and optimized flow. For example, the IPT improved the hanger clamp production process by implementing a horizontal press primarily for hanger clamp forming. The IPT also investigated robotic welding of standard hanger configurations to automate the welding process. NMC developed several flexible fixtures for fit, tack, and welding of hangers that accommodate the varying configurations of each weldment. These technologies were initially tested at NMC and are being pilot tested at EB.

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

EB is pursuing implementation of several technologies developed under this project, including:

- Hanger rod/stud welding station – implemented
- Horizontal press – implemented for forming hanger clamps >2”; demonstrated hole punching benefit
- Fit, tack, and weld fixtures – implemented
- Shop layout optimization - phased implementation presented to EB management

Full implementation is targeted for the 1<sup>st</sup> quarter of FY18 at EB on Virginia Class submarine (VCS) Block IV or the first available Columbia Class submarine (CLB) hull.



A manufacturing work cell that automates and / or mechanizes hanger fabrication will reduce costs, improve quality, and increase throughput on multiple naval platforms. NMC photo

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

- Projected 5-year savings for VCS and CLB hulls constructed at EB is \$9.7M
- Savings realized through project results allow additional hanger throughput required for CLB
- Reduced rework and material handling using a more efficient work flow while increasing throughput
- Improved ergonomics and safety
- Reduction in hanger manufacturing costs

## TIME LINE / MILESTONE

Start Date: May 2015  
End Date: September 2017

## FUNDING

Navy ManTech Investment: \$1.67M

## PARTICIPANTS

PMS 450  
PMS 397  
Naval Surface Warfare Center, Carderock Division  
EB  
NMC  
ONR Navy ManTech

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