

Ingalls Implements DDG 51 Sonar Dome Manufacturing Improvements Ahead of Schedule

Status: Implemented (Partial Transition/Partial Implementation)

PROBLEM / OBJECTIVE

This Navy Metalworking Center (NMC) project has streamlined current processes and procedures to fabricate the Aegis Destroyer (DDG 51 class) sonar dome, which has a complex geometry and is challenging to construct. NMC is investigating metrology solutions as well as customized fabrication tools, fixtures, and automation / mechanization, which will improve the current manual processes. The project results reduce the time, labor, and rework associated with fabricating and assembling the sonar dome at Ingalls Shipbuilding (Ingalls).

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The Integrated Project Team (IPT) assessed the sonar dome fabrication process, developed concepts, and downselected the concepts for prototyping. The IPT enhanced / integrated commercial-off-the-shelf material removal technologies and developed prototype tools to improve the sonar dome fabrication process. In October 2014, NMC performed field trials of the tools in several areas of the sonar dome fabrication processes at Ingalls with craftsmen and operations supervisors. NMC is also conducting metrology system field scanning trials at Ingalls on four sonar dome focus areas on DDG 117 and 119. The advanced metrology techniques will improve the dimensional accuracy of the complex subassemblies, reducing the need for additional labor hours to address fit-up issues. NMC will compare the specific parts after processing and develop advanced metrology procedures with Ingalls.

Implementation and Technology Transfer:

Due to successful demonstration and tool validation, Ingalls has implemented two material removal tools (the Equipois zeroG4[®] mechanical arm with NMC magnetic mounts and the Hypertherm[®] Powermax[®] 105 plasma cutting and gouging system) earlier than anticipated for DDG 117 and 119. Ingalls is buying more Powermax 105 units for use on sonar domes and other key fabrication areas. Ingalls also is planning additional mechanical arm purchases for use throughout the shipyard. In addition, these solutions will be applied to Amphibious Assault Ship (LHA), Amphibious Transport Dock (LPD) and National Security Cutter (NSC) hulls under construction at Ingalls, saving approximately 12,000 additional labor-hours.



This project is addressing fabrication and assembly challenges of the sonar dome. Ingalls photo

Expected Benefits and Warfighter Impact:

- Reduced labor to fit and assemble DDG sonar dome components by 30% and structures across other DDG process areas by 20%.
- Estimated labor reductions will save \$15M over five years on platforms constructed at Ingalls.
- Process improvements may also improve environmental, health and safety conditions for employees.

TIME LINE / MILESTONE

Start Date: October 2013
End Date: February 2016

FUNDING

Navy ManTech Investment: \$2.1M

PARTICIPANTS

DDG 51 Class Program Office (PMS 400D)
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Ingalls
Forming and Metrology Industry Partners
NMC
ONR Navy ManTech

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