NSAM and GDEB Improve Automated Processing of Steel
By Developing CAD/CAM Interface

Problem / Objective:
The U.S. Navy and General Dynamics Electric Boat (GDEB) have a joint initiative to reduce the construction cost of the VIRGINIA Class submarine (VCS) and OHIO Replacement submarine (OR). The Navy ManTech Program is participating in this initiative with specific focus on improving manufacturing processes for ship construction.

GDEB has made significant investments in new manufacturing technologies and processes in order to support the schedule demands for VCS and OR submarines. One such improvement is the automated processing of steel shapes, including cutting, footprint marking and coping. This technology has matured among construction industries and has proved well-suited to ship construction. Shape processing machines such as the Voortman® utilize a standardized format (DSTV) for model input. The first generation usage of the Voortman® at GDEB will require manual input of program instructions. The objective of this project is to develop the interface to feed the shape processing machine directly from the Computer Aided Design (CAD) product model without manual intervention.

Accomplishments / Payoff:
By automating a currently manual process, the proposed tool will enable significant savings in a variety of areas due to the automation of a currently manual process. Advancements to the state of manufacturing technologies for shipbuilders are expected by automating CAD to Computer Aided Manufacturing (CAM) interface for structural steel shapes. Currently, similar interface technology is commercially available but this project will focus on adapting this existing technology to shipbuilding requirements.

Implementation and Technology Transfer:
This project will be executed through a series of tasks conducted over a 12 month period. The first task will define the detailed design requirements, the subsequent five tasks will develop and test various capabilities of the software followed by a demonstration of the tool capabilities, and final report will be issued during the concluding task.

Expected Benefits:
This technology, once implemented, could potentially save an estimated $2.1M per OR hull. These projected saving estimates are based on increased installation efficiency due to markings. Additionally, GDEB anticipates some VCS program savings as a result of the pending VIRGINIA Payload Module construction activities.

Timeline/Milestones:
Participants:
- ONR Navy ManTech
- General Dynamics Electric Boat (GDEB)
- OHIO Replacement Program Office (PMS 397)
- VIRGINIA Class Program Office (PMS 450)
- Naval Shipbuilding & Advanced Manufacturing Center (NSAM)

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Quick Links
- NSAM Website
- SCRA Applied R&D
- Navy ManTech

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