

## **CNST Awards Seven New Projects**

The Center for Naval Shipbuilding Technology (CNST) has recently received approval from the Office of Naval Research (ONR) to award seven new projects worth approximately \$3.245 million dollars. The selected projects address many U.S. shipbuilding and ship repair processes, each intended to increase the efficiency and reduce the costs of manufacturing and maintaining U.S. Navy vessels. These projects have the potential to impact all shipbuilding programs, but in the short term are specifically focused on the VIRGINIA Class Submarine, CVN-21, LHD-8, LPD-17, DDG-51 and T-AKE programs. Counting these seven projects, CNST now has 11 projects underway that cover many U.S. shipyard design, fabrication, assembly and quality assurance processes.

The first of the seven projects awarded will work to develop a system for improving weld inspection procedures in the shipyard environment by developing a new portable weld inspection management system (PWIMS). This system will integrate commercially available equipment components, customize tools for shipyard inspection needs and develop reporting tools. Bath Iron Works is the project lead and has teamed with Edison Welding Institute and Servo-Robot, Inc. on this 21 month effort, \$369,000 effort.

The second project is a Hybrid Laser/Gas Metal Arc Pipe Welding System, led by Penn State's Applied Research Laboratory and supported by the National Steel and Shipbuilding Company (NASSCO). This 24 month, \$1.296 million dollar effort is working to develop a laser/gas metal arc hybrid system capable of performing full penetration, radiographic-quality welds in one or two passes with a mechanized/automatic system. The system will integrate the latest off-the-shelf technology to integrate the hybrid pipe welding system into the shipyard's normal production processes.

Another project that supports the CVN-21 construction processes is an effort to develop a Digital Radiography system that uses Computed Radiography (CR) techniques. Current radiographic inspection processes consume expensive, non-reusable film and chemical systems that drive up the cost and contain materials such as silver that are potentially hazardous to the environment. The desired Digital Radiography system will employ reusable phosphorescent plates that require no chemical development and offer an immediate indication of weld quality. An added benefit is that the digital format provides a more compact, convenient storage of images. The project team of Northrop Grumman Newport News and Fuji NDT are funded for a 19 month effort at \$361,000.

The fourth project will evaluate the effectiveness of commercially-available predictive weld distortion software and implement construction methods that minimize re-work due to distortion. This 16 month, \$500,000 effort is led by Northrop Grumman Newport News, who will team with Battelle Memorial Institute and ESI North America to develop material models, perform analysis, measure as-built construction and validate and implement the predictive methods. The validated software packages will allow shipyards to effectively predict the amount of distortion that will result in a wide variety of shipboard structures. The packages will be capable of evaluating various welding sequences and welding parameters, enabling the welding engineer to effectively reduce the amount of weld distortion.

The fifth project is another predictive weld distortion effort. This 24 month, \$989,000 project is led by Electric Boat Corporation, who has teamed with Battelle Memorial Institute, ESI North America and the Edison Welding Institute. This project will also investigate the applicability of weld distortion prediction software, but will specifically focus on the circularity of submarine hull sections to significantly reduce the costs associated with correcting weld distortion in the VIRGINIA Class construction process.

The sixth project is an effort to re-engineer the internal supply chain/material delivery process. Northrop Grumman Ship Systems leads the project, whose team members include Northrop Grumman Information Technology, Inc. and the Gulf Coast Region Maritime Technology Center, University of New Orleans. Their combined efforts will focus on this 12 month, \$500,000 project on reducing the supply chain problems that result from misplacement of material and disruption in workflow.



The seventh project will design and implement a modern system for an extensive quality training program for craft people. The 12 month, \$500,000 effort is led by Northrop Grumman Ship Systems, partnering with Northrop Grumman Information Technology, Inc. and the Gulf Coast Region Maritime Technology Center, University of New Orleans. The system will allow daily tasking, status updates and quality performance analysis for individual structural welders. It will include comprehensive Visual Testing Level II instruction and on-the-job statusing with trained mentors.

**About CNST**

CNST is a Navy ManTech Center of Excellence, chartered by the Office of Naval Research (ONR) to identify, develop and deploy, in U.S. shipyards, advanced manufacturing technologies that will reduce the cost and time to build and repair Navy ships. For additional information on this and other CNST projects, please visit [www.cnst.us](http://www.cnst.us).