

CNST Awards Mobile Hybrid Laser Arc Welder Project

The Center for Naval Shipbuilding Technology (CNST), through its partnership with the Office of Naval Research and Navy ManTech, recently awarded a \$1.6M project to research and develop a Mobile Hybrid Laser Arc Welding (MHLAW) System. Bath Iron Works is leading a project team that also includes Northrop Grumman Ship Systems, ESAB North America and PL Systems. The MHLAW will provide shipyards with an economical way to implement hybrid laser arc welding without having to incur the cost associated with installing expensive gantry or handling equipment and will use commercially-available, technically-proven components.

Current ship construction methods include welding processes that have been employed for decades. Although these processes have consistently produced good quality welds at reasonable costs, they are relatively slow when compared to new welding processes such as Hybrid Laser Arc Welding (HLAW). Additionally, the heat input of conventional processes is high compared to HLAW and is the primary contributor to welding induced distortion. Distortion control and distortion correction are significant non-value-added activities that cost US shipyards a great deal of time and money. This effort plans to develop a cost efficient way to produce high quality fillet welds faster, with lower heat inputs and reduced distortion.

The MHLAW technology proposed in this project has the potential to (1) reduce cost by increasing weld speeds (thereby reducing panel fabrication times) and (2) improve quality by reducing distortion, and improving dimensional accuracy and metallurgical properties.

The project team envisions a mobile tractor that can safely and efficiently produce fillet welds using the hybrid laser arc welding process. Most of the individual components necessary to build the system are already commercially available but may require modest modifications. The primary technological challenge faced by the team is to design and build an enclosure for the mobile welder that satisfies applicable safety standards; a daunting task when industrial lasers are involved. If successful, this innovative approach will allow shipyards to implement a state of the art welding system for a fraction of the cost of a traditional gantry-based system or one that requires the entire welding operation to be contained in a laser-safe enclosure. Another benefit is that a mobile system could greatly expand the number of welds made using an advanced mechanized process, since these processes are, in general, limited to use in panel line operations. Broad industry implementation is possible because the technology will be widely applicable to shipyards processes.



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.