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Laser Imaging Aimed at Achieving 85 Percent Reduction in Submarine Manufacturing Costs

*Project is Managed by the
Advanced Technology Institute, an SCRA Affiliate*

CHARLESTON, SC – September 2, 2009 – An innovative laser imaging technique, developed with funding from the [Office of Naval Research](#) (ONR), could cut more than 7,700 man hours from the manufacturing cycle of the VIRGINIA-Class Submarines (VCS) operated by the U.S. Navy. ONR chartered [The Center for Naval Shipbuilding Technology](#) (CNST), a Navy ManTech Center of Excellence, to develop advanced manufacturing technologies and deploy them in U.S. Naval shipyards. Since its inception in 2003, CNST has been managed by the [Advanced Technology Institute](#) (ATI), an [SCRA](#) affiliate. ATI is headquartered in Charleston at the Trident Research Park.

The savings could reach \$500K per submarine, translating to a projected savings of \$15.5M over a 31-hull construction program.

Successfully piloted in June 2008, the laser image projection technology allows the Quonset Point, R.I., Electric Boat (EB) manufacturing facility to automate the layout of attachments during the early stages of outfitting the VCS. In its first implementation, this automation reduced labor by an average of 85 percent compared to the previous method.

The laser imaging technology uses 3-D digital ship design data generated by the OneStop CAD database. OneStop extracts positional data from the EB product model to determine the quantity and specific location of various attachments.

The EB project team cut its dependency on paper templates and string measurements using OneStop. In fact, the team located and attached 4,822 electrical and ventilation hangers, and installed approximately 8,862 studs in 21 of the 22 VCS hull cylinders during the pilot program. The laser image projection technology will ultimately equip production workers with direct access to the CAD model information needed to locate/mark points of attachment.

The EB project team continues to evaluate additional uses for the technology, and in future pilots will include attachment points for piping, sound damping and other fixed point attachments. The cylindrical shape of the submarine's hull is ideally suited to this technology, but other ship construction applications are also being considered and could result in cost savings for other Navy construction programs.

ONR's Navy Manufacturing Technology (ManTech) Center for Naval Shipbuilding Technology (CNST) sponsored the pilot. "ManTech sponsorship is making a huge impact here at our QP facility," said Danielle Fernholz, point manager at the EB's Quonset Point facility. "We can't thank [ONR] enough for the tremendous opportunities this program is affording us."

Previous ManTech efforts on the VCS are projected to reduce design and engineering costs by \$3.65M per year, generate a per-hull savings of \$5.275M, reduce production cycle time from 84 to 60 months and enable the acquisition of two submarines per year. Known as Design for Production (DfP), these efforts have yielded an optimized design and production environment for the VCS and are applicable across the shipbuilding and weapons systems industries.

"ATI continues to set the pace for SCRA and its affiliates in business and technology best practices," said Bill Mahoney, SCRA CEO. "In addition to ATI's work managing this important project to support and improve the affordability of Navy systems, our Man

Tech Center practices continue to benchmark as tops among the nine Navy Centers of Excellence.”

[About The Office of Naval Research \(ONR\)](#)

The Department of the Navy's Office of Naval Research (ONR) provides the science and technology (S&T) necessary to maintain the Navy and Marine Corps' technological warfighting dominance. Through its affiliates, ONR is a leader in Science and Technology with engagement in 50 states, 70 countries, 1035 institutions of higher learning, and 914 private industry partners. ONR employs approximately 1400 people, comprised of uniformed, civilian and contract personnel.

[Center for Naval Shipbuilding Technology \(CNST\)](#)

The CNST supports the Navy's ongoing effort to develop and deploy advanced shipbuilding and repair technologies. Its objective is 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. It was established in 2003 and is located in Charleston, SC. CNST is funded by the Navy's ManTech Program.

[About the Advanced Technology Institute \(ATI\)](#)

The Advanced Technology Institute builds international consortia to develop and implement innovative solutions for manufacturing, aerospace, automotive, maritime, metals, energy and healthcare industries. ATI-led collaborations attract world-class talent from premier companies, universities and government agencies. A private, non-profit research corporation with principal operations in Charleston, SC, ATI is an affiliate of SCRA.

[About SCRA](#)

SCRA is a global leader in applied research and commercialization services with offices in South Carolina, Ohio and near McLean, Virginia. SCRA collaborates to advance technology, providing technology-based solutions with assured outcomes to industry and government, with the help of research universities in SC, the US and around the world.

