

NAVY SBIR TRANSITION PROGRAM

SPOTLIGHT

Company: Texas Research Institute Austin, Inc.
Website: www.tri-austin.com

POC: Vince Newton, Director of Business Development
Phone: (703)-944-4763

Address: 415 Crystal Creek Dr.
Austin, Texas 78746

TRI Austin: Helping the Navy Achieve Longevity for Subs through a Novel Coating Process

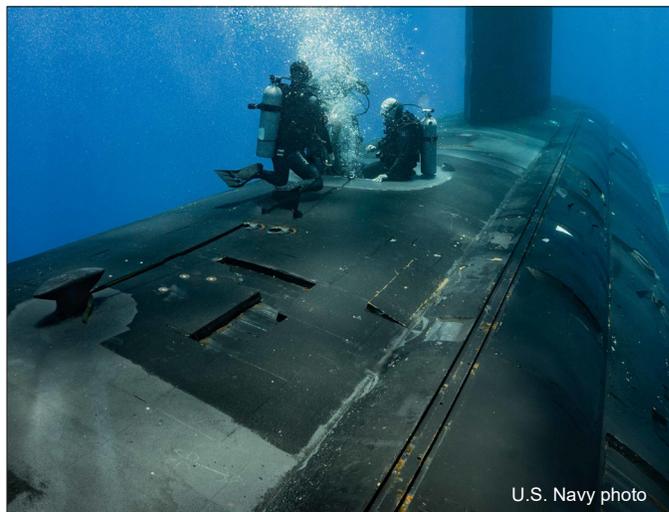
By Julie Scuderi

Underwater electrical cables are critical equipment for U.S. Navy submarines and ships. These cables must function under seawater without electrical failure, which could jeopardize the vessel's mission and require a return to port for replacement.

The hulls and outboard machinery of U.S. Navy vessels require cathodic protection to prevent corrosion damage. This cathodic protection prevents metal ship hulls and machinery from corroding, but an unfortunate side effect is failure induced in nearby items with polymer-to-metal bonds. Such failures are referred to as "cathodic delamination" or "cathodic disbondment."

This cathodic delamination can take place between the metal shell and the polymer overmold of cable connectors, causing water to get into the connector. If this occurs, the cable can short out and stop functioning. Cathodic delamination causes hundreds of millions of dollars of damage to marine hardware every year for the U.S. Navy and is also a major problem for the offshore oil drilling industry.

The Navy used the Small Business Innovation Research (SBIR) program to



U.S. Navy photo

Underwater electrical cables are critical equipment for U.S. Navy submarines and ships. Cathodic delamination can take place between the metal shell and the polymer overmold of cable connectors, causing water to get into the connector. If this occurs, the cable can short out and stop functioning. TRI Austin's new coating can prevent cathodic delamination and extend the life of underwater cables.

identify and fund a small business that could provide a solution to this problem. The SBIR effort advanced the state of the art in anti-corrosion coatings by developing a robust non-conductive coating suitable for bonding to various connectors in the outboard environment.

Under this SBIR, Texas Research Institute Austin (TRI Austin) developed a cathodic delamination resistant coating. For over two decades, TRI Austin has successfully worked alongside the Navy and brought to market multiple technologies for the fleet

SPOTLIGHT

Helping the Navy Achieve Longevity for Subs through a Novel Coating Process...Continued

and warfighter. These include coatings, adhesives, greases, foams, and composite materials. The company serves many industries but is primarily focused on Naval submarines and surface ships, military vehicles, and aerospace applications.

TRI Austin's new non-conductive coating (NCC) 209 is a non-metallic, cathodic delamination resistant coating for outboard applications on cables, connectors, and transducers. TRI NCC 209 outperforms all other NCC systems, with peel strengths well beyond any previously displayed.

Independent third-party testing results showed a bond that survives the harshest corrosive environments with a greatly extended service life for coated parts. TRI NCC 209 reduces the number of failure points, increases reliability, reduces cost, and provides easier application methods compared to previous NCC systems.

"We developed the legacy product in this area back in the late 1990s so we had a leg up going into the SBIR and in understanding the issues and the need," explains Vince Newton, director of

business development at TRI Austin. "In this case, you need extensive accelerated life testing to simulate the environment you'd see on a sub. Along with NUWC Newport, we ran an 18-month test, which is equivalent to an 18-year service life. Once the results were in, we knew we had a winner."

The major benefit of TRI NCC 209 is the cost savings realized by the Navy. As Newton explains, "If you use the old coating on a Virginia class submarine, with their advanced impressed current cathodic

protection (ICCP) system it may fail within a year to 18 months, and you'd have to replace those cables. Some are easier to replace than others, but they are all very expensive to keep replacing. If you can extend that service life

to 10, 15, 18 years, then you're saving a lot of money."

Since this cost savings equates to hundreds of thousands of dollars per submarine, total savings reach into the hundreds of millions of dollars. And while TRI Austin is currently fulfilling its \$300K worth of purchase orders through its latest Phase



TRI Austin's new NCC 209 coating will eventually be used to update all the U.S. Navy's Virginia class submarines.

III contract, the intended transition path involves updating all the Navy's Virginia class submarines to the new NCC 209 coating, which will take several years. The approval for TRI NCC 209 for use on the Naval submarine fleet was granted by the Navy's Submarine Maintenance Engineering, Planning and Procurement Activity (SUBMEPP) in Portsmouth, New Hampshire.

"SBIR has been great for us," Newton says. "It's almost the only R&D funding source for innovative small businesses that's out there. Big companies do far less groundbreaking research internally now; they just buy technology that's already been developed. The SBIR program is unique as the only R&D funding available for small business to transition new technologies to actual products while retaining proprietary data rights. In SBIR, you control the intellectual property and if you commercialize, you can take it into other sectors. And out of all the SBIR programs the Navy is king. If you're trying to commercialize a technology the Navy is where to go. They are far better at that than any other agency when it comes to SBIR."

For TRI Austin, the potential commercial sector includes any industry where materials are underwater for an extended period and are prone to corrosion, including offshore oil and gas platforms, remotely operated vehicles and buoys, and transcontinental cables.

Based in Austin, Texas, TRI Austin was established in 1975 with the goal of performing high quality, rapid response research and development in advanced materials and materials testing. TRI Austin was founded to address the reliability and materials needs of the U.S. Navy, and to provide advanced materials and technologies for the Department of Defense, NASA, and other government and commercial clients. The company has evolved into an organization that provides engineering services and advanced material development for a global clientele.

Looking to the future, TRI Austin is continuing to evolve its cathodic protection portfolio—this time with a polyurethane overmold that eliminates the need for a primer. In the old system, six layers of chemicals and materials were required; in this newest iteration, just two to three material layers are needed.

The company plans to continue its tradition of commercializing SBIR-funded R&D while consistently serving its government clientele.

"It's really great, when talking about commercialization, to have the government's stamp of approval on something," explains Newton. "And you get that with SBIR. When you develop a product and can say, 'The Navy has qualified and approved this,' that goes a long way with the customer."