Trusted CI Success Story
Ships and Poles

Trusted CI provides cybersecurity advice on research ship designs

Academic research vessels study issues vital to the scientific study of the Earth, such as the health of marine fisheries and harmful algae blooms. To conduct these studies, these vessels leverage a wide array of instrumentation, including sonar for seafloor mapping, and support for human, remote, and autonomous underwater vehicles.

But given limited resources for security, what are useful approaches to design facilities in a way that operational technology (OT) can be better protected against cyber attacks?

In 2022, as part of its mission to enable trustworthy science, Trusted CI conducted a year-long study on the state of OT security in NSF Major Facilities. Because facilities often build ships or instruments or buildings that may be in service for 15 or 20 years before a major renovation, it's vital to design these facilities with cybersecurity in mind.

In 2023, Trusted CI engaged with NSF-funded facilities in various stages of design and construction to help them build cybersecurity into the design of ships, underwater vehicles, and polar facilities.

The Trusted CI team traveled to Oregon State University, where the Regional Class Research Vessel (RCRV) team was awaiting delivery of three ships that it helped to design.

Chris Romsos of Oregon State University said Trusted CI had a measurable impact. "One example is in helping to formalize and document cybersecurity procedures used to test updates and configuration changes on shipboard science systems and instruments, increasing ship operators' confidence that applying them will not result in unexpected failures."

Trusted CI also consulted with the California Coastal Research Vessel (CCRV) team at the Scripps Institution of Oceanography at University of California, San Diego, where a 125-foot vessel is in the design phase.

"Trusted CI's impacts of engaging with the [Academic Research Fleet] have been transformative, leading to the formation of ARF's Cyber Infrastructure Working Group, the creation of an ARF

Trusted CI's Sean Peisert, left, examining OT systems on the R/V Sally Ride.

CISO, and NSF [Division of Ocean Sciences] adding a program manager for ships dedicated to cybersecurity," said Jon Meyer with Scripps Institution of Oceanography.

Among the highlights of Trusted CI's work with these facilities has included the development of questions to help understand cybersecurity control and requirements during acquisitions — a tool that has been useful to all of the organizations that Trusted CI has worked with this year.

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