Sound-Absorbing Chamber Allows Navy to Test Torpedoes Indoors



March 13, 2025 | By Katie Lange, DoD News

The Navy has various methods of testing torpedoes and other underwater weapons, including at tracking ranges. One unique Navy facility in Keyport, Washington allows experts to test these systems indoors.

The Weapons System Test Facility at Naval Undersea Warfare Center Division was built in the 1980s to conduct land-based testing and evaluation of various undersea weapons capabilities including torpedoes and the sensors attached to them.

“Back the Cold War, they running every torpedo on our test ranges. Every single one that’s produced … before deploying it

to the fleet. Obviously, there's a lot of cost and schedule associated with that," said Will Buck, the deputy division head of the Undersea Systems Acquisition and Assessment Division that runs the facility.

To save time and money, the Navy built the facility that contains a pressure chamber that's 45 feet long and 12 feet in diameter. The chamber can hold 40,000 gallons of water that Buck's team of about 20 people can pressurize and heat up or cool down to test torpedoes, sensors and unmanned underwater vehicles in their operational environments.

"It only takes about 30 minutes to fill and drain the tank, turn the wrench and test again," Buck said. "So, it just helps us quickly move through test evolutions to make sure that Navy systems are working the way they're supposed to."

While the facility was first set up in the 1980s, it sat dormant for about 20 years after an accident in 1996 at a similar U.S. facility led to its closure. About a decade ago, Buck and his team knew the space could be useful, so they got approval to revitalize and modernize it.

Typically, undersea weapons find their targets through sounds created underwater. The current facility includes an anechoic chamber – a box within the primary pressure chamber that absorbs sound waves – that can simulate the acoustics of an undersea environment.

Buck's team tests weapons in the chamber to find answers to questions such as, what direction the sounds are traveling, if they're loud enough and if they'll be heard far enough away.

There were other questions the team considered. "What's the directivity of this source? How long is the pulse? How loud is it? What frequency is it?" Buck said. "We're trying to make sure that meets the performance requirements of the system," Buck said.

If those parameters aren’t up to par, the risk for a weapon to miss its target is higher, he said.

The team has tested several Mark 48 and Mark 54 torpedoes in the pressure chamber, as well as torpedo warning systems parts, the Gavia UUV and submarine sonar known as the high-frequency chin array.

“We can put almost any kind of naval system – I mean, outside of a submarine or something really, really big – and we can recreate the physical characteristics it’s going to operate under and provide high-confidence data in how it’s going to react, how it’s going to perform and what changes, if any, are going to be made to the system before it goes out into the hands of the fleet.”

Buck said his versatile team constantly gets to flex its design and engineering muscles with the wide variety of work it’s asked to do, especially with all the new technological capabilities that are coming onto the scene.

“Everything we’re doing with UUVs is relatively modern and novel,” Buck said.

Buck, who’s been at NUWC Division, Keyport, for more than a decade, has a bachelor’s degree in physics and a master’s degree in acoustics. He said for many in his field of work, there aren’t a lot of opportunities outside of academia, so the Navy has been a great place for him to put those skills to work and make a real difference.

“They value competent and well-thought-out ideas and will put investment behind that,” Buck said of his division. “We’ve come a long way as a result. I’ve loved being here.”

The facility has partnered with various institutions on some of its work, including the Applied Research Lab at Pennsylvania State University. Several of the members of the team have published their work and presented at scientific

conferences, helping them to stay engaged with academia.