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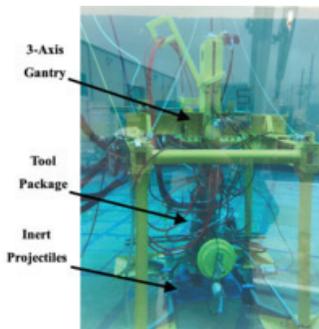
## Successful Demonstration of Cut and Capture System Technology

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Munitions are encountered in a variety of underwater environments as unexploded ordnance (UXO) or discarded military munitions (DMM).

These items can cause unacceptable explosive risk to critical infrastructure, recreational divers, and fishermen. Demilitarization of underwater munitions currently requires either in situ remediation through use of countercharges or jet perforators placed by explosive ordnance disposal divers or by the recovery of the hazardous ordnance for demilitarization on the surface. In situ detonation is most frequently used but can destroy local marine ecosystems.

In their **ESTCP project**, Dr. Steven Schmit and his team from Gradient Technology are evaluating the use of remotely operated high-pressure waterjets to cut open UXO and DMM as well as a capture system for the munitions constituents from ordnance that litter the ocean floors with as little disturbance of aquatic corals and sea mammals as possible.



On February 27, 2020, Dr. Schmit and his team demonstrated its technology for the underwater demilitarization of munitions. High-pressure waterjet technology was successfully used to cut an access hole into an inert Navy 5-inch/38-caliber projectile and wash out the inert fill. The cutting abrasive and swarf were collected without leakage to the environment. Likewise, the inert fill washed from the projectile was completely collected. During the one-day demonstration, six inert projectiles were processed in a 20-foot deep test tank located at Delta SubSea in Houston, Texas.

Gradient Technology's Cut and Capture System was designed to be a deployable suite of tools remotely operated to render safe or demilitarize ordnance located underwater. The tools accomplished the following:

- 1) cleaning of a munition of external bioencrustations using a high-pressure waterjet cleaning tool,
- 2) positioning of the cut and capture apparatus on the munition,
- 3) cutting an access hole in the side of the munition using a high-pressure entrainment-style abrasive waterjet cutting head,
- 4) removing the resulting plug,
- 5) washing out the internal contents of the munition using a high-pressure washout head, and
- 6) capturing the effluent generated during operations without leakage to the environment.

Dr. Schmit and his team plan to develop the Final Report in the fall of 2020, which will be posted to the [project web page](#).

