## Topic: N141-056

## Texas Research Institute Austin, Inc.

Waterproof Towed Array Hosewall

High moisture permeation rates through hosewall materials are a primary failure mode in fat line towed arrays. TRI/Austin Inc. demonstrated the feasibility of reducing water permeation in TPU hosewall designs in Phase I by incorporation of a TPU having a hydrophobic polymeric backbone. These results indicate water permeation can be reduced by a factor of five to ten. TRI/Austin is teaming with a major towed array supplier and the current hose manufacturer with the goal of rapid insertion of developed moisture resistant elastomers into existing/planned arrays. Materials from co-extrusion trials showed the physical and mechanical properties of the laminate hose are very similar to currently used polyether backbone TPU.

## Technology Category Alignment:

Ground and Sea Platforms

Sensors, Electronics and Photonics

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**SYSCOM:** NAVSEA

**Contract:** N00024-16-C-4008

Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00024-16-C-4008

# Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for Release. Distribution is unlimited.
NAVSEA #2016-621

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Waterproof Towed Array Hosewall
Texas Research Institute Austin, Inc.

## WHO

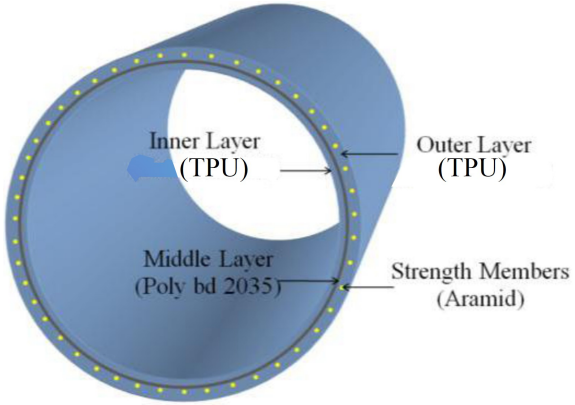
**SYSCOM:** NAVSEA

**Sponsoring Program:** Naval Sea System Command

**Transition Target:** SSN-688, SSN-688I, SSN-21, SSN 774

**TPOC:**
(202)781-4058

**Other transition opportunities:** Low water absorption polyurethanes have potential use in many subsea applications within the Navy, off shore oil and gas, and commercial underwater markets.




TRI/Austin, Inc. 2016

## WHAT

**Operational Need and Improvement:** The improved performance of the Thermoplastic polyurethane (TPU) hydrophobic backbone reduces permeation through the system there by extended the service life of various towed array systems.

**Specifications Required:** Water transmission rates will be evaluated comparing performance for physical properties, the tests will include hardness, abrasion resistance, specific gravity and density, and acoustical properties..

**Technology Developed:** Demonstrating the feasibility of reducing the water permeation in TPU hosewall designs by incorporation of a TPU having a hydrophobic polymeric backbone. These results indicate that water permeation can be reduced by a factor of five to ten by incorporation of the hydrophobic TPU.

**Warfighter Value:** Extending the service life of of towed array systems by reducing water permeation will reduce maintenance costs, extend procurement cycles, and allow for better long term performance of towed array systems across the fleet.

## WHEN

**Contract Number:** N00024-16-C-4008 **Ending on:** February 21, 2018

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|---|---|---|---|---|
| Performance Screening Testing | Med | Meet Physical Requirements | 3 | October 2016 |
| Prototype Validation Testing | Med | Meet all requirements | 4 | March 2017 |
| Accelerated Life Testing | Med | Meet Service Life | 5 | September 2017 |
| Qualification Testing | Med | Perform in Field Testing | 6/7 | January 2018 |
| Scale Production | Med | Meet all Requirements | 7 | January 2019 |

## HOW

**Projected Business Model:** TRI will be looking for sub tier licenses for this technology with both Navy primes, secondary Navy vendors along with commercial applications. The licences will be specific to market segment and will be reflected in the terms and conditions.

**Company Objectives:** TRI's long history in subsea components failure analysis, accelerated life testing and material solutions for extending service life of cable and connectors, sonar systems, and towed arrays should continue to make TRI the market leader in these area's. TRI is interested in discussing the low water absorption hose wall technology with Navy primes who manufacture towed array systems.

**Potential Commercial Applications:** The off shore oil and gas market has many of the same issues facing them as does the Navy, making them a prime market for these low water absorption material technologies.

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