# Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2025-049

Topic # N221-025
Advanced Technologies for Automated Replay and Reconstruction of Theater Undersea Warfare Mission Data
ARiA

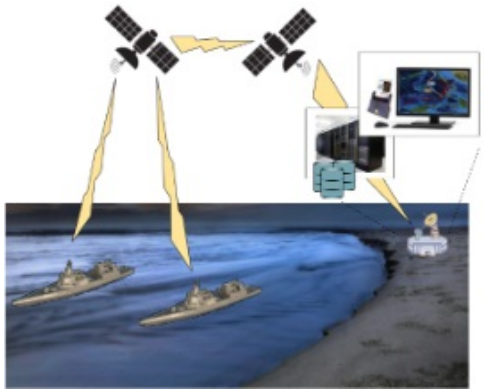
## WHO

**SYSCOM:** NAVSEA

**Sponsoring Program:** NAVSEA PEO IWS 5E

**Transition Target:** AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS) Build 3 (B3) Program of Record (POR). This will be developed initially for USW-DSS B3 Ashore and later extended to USW-DSS B3 Afloat installations.

**Other Transition Opportunities:** Systems that interface with USW-DSS, such as the AN/SQQ-89A(V)15, CV-TSC, IUSS, GCCS-M, DCGS-N, and tactical data links including Link 11 and Link 16.



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**Notes:** Over its fifteen-year history, ARiA has a strong record of transitioning cutting-edge research into solutions that meet urgent government needs though the SBIR/STTR program. Leveraging over $4m of private investment and over $25m in research investment, ARiA has transitioned multiple products through SBIR/STTR funding to DoD PoR. Most recently this has involved transitioning AI/ML software tools to the CDAO JATIC PoR resulting in a return on the SBIR/STTR investment of over 20x.

## WHAT

**Operational Need and Improvement:** Current methods for reconstructing and analyzing Theater Undersea Warfare (TUSW) mission data, essential for comprehensive event reconstruction and a wide-area view, are hampered by manual collation, filtering, and editing across disparate tactical systems. This technology gap is addressed by Record, Replay, Reconstruct & Analyze - Automated & Extensible (RAX). RAX is an advanced capability for the AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS) Build 3 (B3), providing automated and configurable data collection, long-term storage, replay, and reconstruction. RAX effectively collects and manages mission data for analysis and reduces the labor-intensive processes of existing solutions.

**Specifications Required:** The RAX system design and architecture supports automated and configurable data collection and recording, long-term data storage and archive, data replay, and automated reconstruction. It reduces the workload required for watch floor personnel to perform essential reconstruction and analysis.

**Technology Developed:** ARiA is developing algorithms for event and track retrieval, filtering, detection, and labeling based on AI/ML and information-retrieval theory. These algorithms will provide the capability to automate and accelerate the reconstruction and analysis of multi-platform TUSW mission data.

**Warfighter Value:** ARiA's innovative algorithms for event and track retrieval, filtering, detection, and labeling improve the reconstruction and analysis of mission data, particularly for multi-platform TUSW missions with large data sets. This automates and accelerates the current process and enables a 25% reduction in workload, measured in operator hours, required for watch floor personnel to perform these analyses. Essentially, RAX makes it faster and easier for watch teams to benefit from lessons learned from past operations to improve Anti-Submarine Warfare (ASW) mission effectiveness.

## WHEN

**Contract Number:** N00024-24-C-S057 **Ending on:** May 07, 2026

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|---|---|---|---|---|
| Initial prototype | Medium | Replay web service streaming tracks | 5 | 4th QTR FY25 |
| MVP Integration with USW-DSS | Low | Technology demonstrated in a relevant environment | 6 | 3rd QTR FY26 |

## HOW

**Projected Business Model:** ARiA plans to retain the SBIR data rights for its developed Record, Replay, Reconstruct & Analyze - Automated & Extensible (RAX) software. ARiA's technology is targeted for a phased transition into the AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS) Build 3. The initial Minimum Viable Product (MVP) is scheduled for integration in Q2 FY26 (CD 26-2), with the full-capability build planned for Q4 FY27 (CD 27-2). Following this, ARiA plans to transition the technology to other related tactical systems, including the AN/SQQ-89A(V)15, CV-TSC, and IUSS, as well as pursuing Foreign Military Sales (FMS).

**Company Objectives:** ARiA's objective is to address the Navy's need for an automated and extensible capability for recording, replaying, and reconstructing Theater Undersea Warfare (TUSW) mission data. ARiA intends to integrate the developed Record, Replay, Reconstruct & Analyze - Automated & Extensible (RAX) software as a primary transition into the AN/UYQ-100 Undersea Warfare Decision Support System (USW-DSS) Build 3. Following the initial integration, ARiA is looking for programs and prime partners to transition this technology to other Command and Control (C2) systems, such as the AN/SQQ-89A(V)15 and Carrier Tactical Support Center (CV-TSC), that can benefit from a robust, automated data collection, management, and analysis capability.

**Potential Commercial Applications:** The technologies developed for RAX are applicable to a wide range of organizations beyond the U.S. Navy. The core capabilities for robust, long-term data collection, management, replay, and automated Reconstruction & Analysis (R&A) can be leveraged by an organization needing to analyze large, disparate datasets over extended periods. Potential commercial applications include improving operational efficiency, enhancing decision-making processes, and assessing geospatial operational trends.

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