Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.
NAVSEA #2025-035

Topic # N192-094
Interactive Tactical-Oceanography Training for Sonar Operators
ARiA

WHO

SYSCOM: NAVSEA

Sponsoring Program: PEO IWS 5.0

Transition Target: Surface Ship Undersea Warfare Combat System Office, AN/SQQ-89 and AN/BQQ-10 Programs of Record (Moodle Learning-Management System component)

Other Transition Opportunities: Other program offices with sonar training programs including the Naval Aviation Training Systems and Ranges Program Office (PMA 205), the Maritime Patrol and Reconnaissance Aircraft (MPRA) Program Office (PMA 290) and the Air Anti-Submarine Warfare (ASW) Systems Program Office (PMA 264).

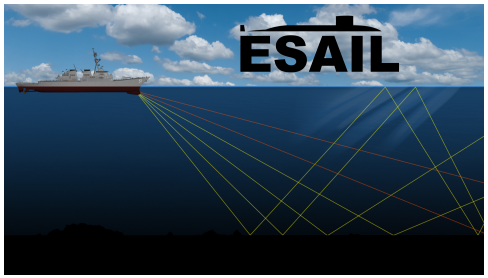

Image courtesy of ARiA 2025

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: The ocean environment has a large impact on sonar detection and counter detection, requiring sonar operators to understand and reason about multiple critical factors. ESAIL is a standalone, web-deployed training tool for individual use that simulates the effects of the ocean environment on sonar. The tool provides a higher fidelity training simulation than current training tools and incorporates more variables to better assist operators in learning the multi-factor relationships between the ocean environment and sonar to aid mission planning and tactical decision making.

Specifications Required: Develop a web-based sonar training tool that allows users to interact with the ocean environment and learn how different factors affect sonar performance. Specifically, helping sonar technicians develop the ability to translate information and predictions from tactical decision aids (TDAs) into actionable information that enables them to 1) identify relevant critical factors, 2) accurately plan missions, 3) anticipate how the critical factors will impact the mission over time, and 4) to identify unexpected behavior and investigate the causes.

Technology Developed: ESAIL is designed to provide a series of tailored scenarios, based on simulation of actual locations in the world, for which successful completion of the task (search, avoid detection, track, etc.) requires that the user make use of a particular subset of heuristics/mental models and TDA tools. Using interactive 2D and 3D visualization of the ocean environment and sensor performance, users gain an intuitive understanding of how critical factors influence operation and objectives.

Warfighter Value: ESAIL uses real data and real-world environments to compute, model, and visualize the oceanographic environment and the effects that each factor has on underwater sound propagation to teach tactical oceanography. Through the use of real-world simulated, tailored scenarios, warfighters practice and learn in low risk, high reward settings enabling them to develop the necessary skills to succeed in their missions. Through the use of innovative, engaging, and flexible learning tools warfighters can better translate their learning into mission relevant actions, making Fleet ASW forces more effective and lethal.

WHEN

Contract Number: N00024-25-C-S045 **Ending on:** Feb 10, 2027

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Step 1 Readiness Review	N/A	Feedback from working group	3	1st QTR FY26
AxB Step 1 Brief to Sensor Optimization Working Group and Training Working Group (Technology Demonstration to End Users)	Low	Approval from working groups	4	2nd QTR FY26
AxB Step 2 Software Evaluation (Independent Government Evaluation)	Medium	External test and Approval by working group	5	2nd QTR FY27
If Option exercised, AxB Step 2 Software Evaluation of revised product	Low	External test and Approval by working group	5	4th QTR FY27
If Option exercised, Containerized build of ESAIL v1.0	Medium	Delivery and integration with the Moodle LMS	6	2nd QTR FY28

HOW

Projected Business Model: Primary funding comes from government prime contracts—especially with the Department of Defense—with secondary funding from R&D contracts with major firms in sectors like aerospace, oceanography and defense. The software-engineering component commercializes signal-processing, sensor, and training technologies using IP from the R&D work. It focuses on developing middleware and executable libraries for integration into larger systems, funded primarily by public-sector sales and secondarily by private-sector sales. The two components reinforce each other: the software-engineering side seeds new R&D, while the R&D side provides testbeds and prototypes to speed development.

Company Objectives: ARiA has led development of sonar-operator training and sonar signal and information processing for the Navy as well as a number of additional related projects. Building upon exceptional past performance, ARiA is continuing to refine and improve simulation-based training and TDAs through focused research and development in acoustic propagation and coupled target/environment scattering for sonar simulation, and model-based signal processing. Through continued development of ESAIL ARiA will provide the Navy with the best training for sonar operators.

Potential Commercial Applications: Our primary transition and commercialization target is the Moodle LMS component of the AxB tactical systems including AN/BQQ-10 (ARCI) and AN/SQQ-89. Secondary commercialization targets focus on related sonar tactical systems including (1) the Integrated Undersea Surveillance System (IUSS) Integrated Common Processor (ICP) and (2) NAVAIR ASW training systems at the Naval Air Station Jacksonville P-8A Integrated Training Center (ITC). Future commercialization targets include training systems for U.S. based tactical sonar systems deployed by foreign navies such as the Royal Australian Navy, the Royal Canadian Navy, and the Japan Maritime Self-Defense Force (JMSDF).

Contact: Jason Summers, Chief Scientist
jason.e.summers@ariacoustics.com (540) 423-0323