Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2024-0375

Topic # N211-072
Autonomous Anchoring System For Unmanned Vessels
TRITON SYSTEMS, INC.

WHO

SYSCOM: NAVSEA

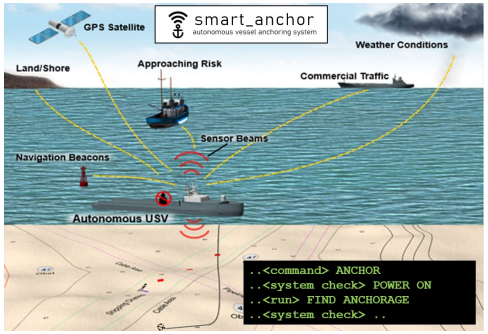
Sponsoring Program: NAVSEA

Transition Target: PMS406 MUSV and LUSV

TPOC: (301) 227-0461

Other Transition Opportunities: Military, including potentially PMS420, and commercial/private vessels such as freighters, tankers, cruise ships, and yachts.

Notes:
Triton Systems' SmartAnchor automated anchoring system is designed to assure vessel operators of predictable and repeatable anchoring operations without the need for human intervention.



SmartAnchor Autonomous Vessel Anchoring System

The SmartAnchor system autonomously responds to and adjusts its mooring for:
• live field traffic,
• dynamic weather conditions,
• electronic chart data,
• varying mooring line tension and chain payout, and
• past and present vessel positions.

Utilizing proven mechanical technologies and MOSA and UMAA compliant software that is interoperable across a multitude of USVs, the SmartAnchor system simplifies anchoring evolutions and provides the ability for coordinated USV operations.

WHAT

Operational Need and Improvement:
Naval operational zones are changing rapidly and the need for unmanned vessels to conduct reconnaissance, serve as scout fleet, and handle resupply missions in hazards environments is in demand. The SmartAnchor Automated Anchor Handling System is being developed to provide these Unmanned Surface Vehicles (USVs) the ability to operate autonomously without requiring human intervention to anchor a vessel for passive station-keeping. Similar to self-parking capabilities for automobiles, this intelligent system is designed to derisk routine vessel anchoring operations with predictable maneuvers and responses to a dynamic field environment. Whether the challenge is removing personnel from hazardous conditions or optimizing the use of personnel, SmartAnchor is being developed to provide anchoring evolutions with autonomous or remote actuation.

Specifications Required:
Capable of accepting commands from a high-level system (autonomously as well as human in or on the loop) and automatically handling, dropping, and weighing anchor. • Scalable in design to handle U7 to U15 equipment (according to ABS SVR) including stockless bower anchors up to 1,590-kgs and stud-link chain up to 40-mm. • Ability to "slip anchor" allowing for an emergency release from its anchorage. • Adheres to a Mobile Open Systems Approach (MOSA) and is Unmanned Maritime Autonomy Architecture (UMAA) compliant to allow for interoperability with planned and future Unmanned Surface Vehicles (USVs).

Technology Developed:
• Autonomously/Remotely operated windlass system that automatically pays out and hauls in anchor and chain, retrieves stuck anchor, and slips anchor during emergencies
• Anchor Controller that determines anchorage locations, commands vessel to maneuver, conducts anchor deployment and recovery operations, and maintains watch over the vessel during anchorage

Warfighter Value:
Enabling USVs to operate fully autonomously and conduct efficient station-keeping operations in combat or high-risk environments without risking personnel. The system is smart, scalable, and reliable for the Navy's most demanding conditions.

WHEN

Contract Number: N68335-23-C-0253 **Ending on:** Oct 02, 2024

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Anchor Handling Equipment Design	Low	Delivery	4	1st QTR FY25
Simulated Anchoring Evolution	Low	Simulated Anchor Deployment & Recovery	4	1st QTR FY25
On-Water Anchoring Test	Medium	Physical Anchor Deployment & Recover	5	4th QTR FY25
Simulated Anchorage Determination & Operation	Low	Simulated Anchorage Selection, Deployment, & Recovery	5	1st QTR FY26
On-Water Vessel Integration and Anchoring Demonstration	Medium	Physical Anchorage Determination, Deployment, Field Adaptation, & Recovery	6	4th QTR FY26

HOW

Projected Business Model: SmartAnchor will be sold in hardware and software packages to vessel operators depending on level of autonomy required.

Company Objectives: Triton Systems' objective for the SmartAnchor system is to perform a successful on-water demonstration of software integration and autonomous anchor control on a vessel of opportunity that can be scaled for full-scale military and commercial applications.

Potential Commercial Applications: Manned commercial and private vessels including freighters, tankers, cruise lines, and yachts.

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