



Acquisition Directorate
Research, Development, Test & Evaluation

U.S. Coast Guard FY25 RDT&E Project Portfolio



UNCLAS | FY25 RDT&E Project Portfolio | CG-926 RDC | A. Arsenault | October 2024
RDC Command Video: <https://www.dvidshub.net/video/867068/coast-guard-rdc-overview>

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Beyond Visual Line of Sight (BVLOS) Technology for Coast Guard (CG) Uncrewed Aircraft System (UAS) Operations

7691

Mission Need: BVLOS operations for CG UAS.

- Objectives**
- Leverage U.S. Southern Command (SOUTHCOM), Joint Inter Agency Task Force-South (JIATF-S), and Navy Research Laboratory (NRL) efforts to explore Medium Range UAS (MR-UAS) Vertical Takeoff and Landing (VTOL) operations from a CG Cutter (CGC).
 - Integrate Detect and Avoid (DAA) technologies for conducting BVLOS operations [sUAS 1st].
 - Conduct land and vessel-based evaluations using DAA technology [sUAS 1st].
 - Conduct a VTOL BVLOS Limited User Evaluation (LUE) from a CGC.
 - Inform due regard parameters for CG BVLOS UAS operations.
 - Establish a BVLOS Certificate of Authorization for CG operations.
 - Conduct a land-based Medium Range-UAS Search and Rescue (SAR) demonstration, followed by a LUE onboard a CGC.



- Notes**
- Legislative requirement.
 - Establish Memoranda of Understanding and Cooperative Research and Development Agreements as necessary with industry partners.
 - Leverage efforts of the Federal Aviation Administration, SOUTHCOM, National Oceanic and Atmospheric Administration, Office of Naval Research (ONR), JIATF-S, U.S. Navy 4th Fleet and other government agencies.

Sponsor's Rep: CG-711
Ops Rep: LANT-3

Stakeholder(s): CG-751, CG-931, CG-41, SOUTHCOM, JIATF-S, NRL, CGCYBER, ONR

RDC Research Lead: Mr. Stephen Dunn
CG-926 Portfolio Manager: LCDR Stephen Thomsen

Anticipated Outcome/Transition: Recommendations for Acquisition Milestone Support
 Recommendations for Standards/Regulations/Policy

Project Start: 13 Mar 19

| | |
|---|---------------|
| MR-UAS VTOL Operations from a CGC (Brief) | 9 Nov 20 ✓ ★ |
| BVLOS Technologies Integrated into Small UAS (sUAS) and MR-UAS Complete | 24 Dec 22 ✓ |
| Detect and Avoid Technologies Integration (Brief) | 27 Jan 23 ✓ ★ |
| Vessel-based sUAS BVLOS Limited User Evaluation D-7 Complete | 17 Aug 23 ✓ |
| Initial Vessel-Based MR-UAS DAA Technologies Demonstration Complete | 11 Oct 23 ✓ |
| Combined Land-based BVLOS sUAS and MR-UAS Demonstration Complete | Nov 24 |
| Land and Vessel-Based BVLOS Demonstrations (Brief) | Jan 25 ★ |
| Beyond Visual Line of Sight UAS Operations (Report) | Mar 25 ★ |

Project Completion: Mar 25

Project Timeline / Key Milestones

Mission Need: Persistent maritime domain awareness using AUSVs.

Objectives

- Assess potential employment options using Autonomous Underwater and Surface Vehicles (AUSV) to support U.S. Coast Guard (CG) mission areas. Using modeling and simulation techniques, assess AUSV Concept of Operations, including:
 - Effectiveness of single and multiple AUSVs; and
 - Effectiveness of AUSV and unmanned aerial system teaming.
- Inform field testing using modeling analysis results.



Notes

- Partner with the U.S. Department of Homeland Security (DHS) Science, Technology Directorate (S&T) Borders, Immigration and Maritime (BIM), U.S. Naval Research Laboratory, Naval Undersea Warfare Center, Naval Surface Warfare Center – Dahlgren Division.

Sponsor's Rep: CG-26
Ops Rep: LANT-3

Stakeholder(s): DHS S&T BIM, CG-721, CG-MLE, CGCYBER, FORCECOM

RDC Research Lead:
 Mr. Ross Vassallo

CG-926 Portfolio Manager:
 LCDR Stephen Thomsen

Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability
 Recommendations for Tactics, Techniques & Procedures

Project Start: 1 Oct 19

| | |
|---|----------------------|
| In House or Contracted Modeling KDP | 23 Sep 20 ✓ |
| Vehicle Operations and Control Training | 20 Jun 21 ✓ |
| Contract for Modeling Effort Established | 14 Sep 21 ✓ |
| MUST: Status Update (Brief) | 16 Aug 22 ✓ ★ |
| MUST: Model Progress Status (Brief) | 26 Sep 23 ✓ ★ |
| Support for DHS MUST Operational Testing Completed | 1 Nov 23 ✓ |
| MUST: Model Simulation Results (Brief) | 13 Sep 24 ✓ ★ |
| Maritime Uncrewed System Technology (Report) | May 25 ★ |
| Project Completion: May 25 | |

Shipboard Based Polar UAS Capability Analysis

1040

Mission Need: Uncrewed aircraft technologies to extend awareness and logistics for polar operations.

Objectives

- Identify and evaluate emerging Uncrewed Aircraft System (UAS) technologies to enhance U.S. Coast Guard (CG) operations in arctic regions.
- Analyze possible UAS and identify integration considerations tailored for CG Polar Security Cutter assets.
- Cultivate joint arctic UAS efforts, interagency cooperation and allied nation information sharing to gain better understanding of uncrewed aerial sensor capability in characterizing marine domain awareness in polar conditions.
- Inform future capabilities and operational documents.



Notes

- Most project 1040 objectives were addressed by ICE PPR and ONR Global in 2023 and 2024 through field experiments. Plan to analyze data from the Office of Naval Research (ONR) Global Frozen Flyer project which was created by the executive officer for the International Cooperative Engagement Program for Polar Research (ICE PPR), (office symbol: DCNO, N9).

Sponsor's Rep: CG-7 UxS
Ops Rep: PAC-3

Stakeholder(s): CG-711, CG-931, CG-6, CG-751, D17, LANT-5, NOAA, CG-MER

RDC Research Lead:
 Mr. Ross Vassallo

CG-926 Portfolio Manager:
 LCDR Stephen Thomsen

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability

Project Start: 1 Apr 24

Project Timeline / Key Milestones

| | |
|---|-----------------|
| Complete Initial Review of ONR Frozen Flyer Data | 26 Jun 24 ✓ |
| Complete Technology Focus Analysis on ONR Data | 9 Aug 24 ✓ |
| Shipboard Based Polar UAS Capability Analysis (Report) | Jun 25 ★ |

Project Completion: Jun 25

CG Auxiliary use of Small Uncrewed Aircraft Systems (sUAS) for Aids to Navigation (ATON)/Private ATON (PATON) Verifications

Mission Need: A reliable and repeatable method for conducting ATON/PATON verifications.

- Objectives**
- Analysis of the sensor uncertainties associated with the current blue UAS platforms participating in the U.S. Coast Guard's (CG) Short Range UAS program, specifically focusing on the Parrot, Skydio, and Puma systems.
 - Replicate high-priority field demands in test vignettes, including: ATON/PATON Mapping, Ice Mapping, and Post-Storm Mapping.
 - Concept of Operations (CONOPS) and Tactics, Techniques and Procedures (TTPs) for each testing vignette, outlining the operational framework, procedures, best practices, efficiency and process improvements for deploying UAS in these scenarios.
 - A secure user interface that seamlessly integrates with official databases (i.e., ArcGIS, SEXTANT, Looking Glass, U.S. Aids to Navigation Information Management System (USAIMS)). Include the use of CG Auxiliary Aid Verification Assistant (AVA) app.



- Notes**
- Builds on work completed by RDC Project 1020, PATON Improvements.
 - Use CG Auxiliary/PATON as first testbed for expansion to ATON. Leverage AVA mobile application tool methodology for data transference.
 - Partner with Sectors and Districts for vignette development and testing.
 - Partner with CG Academy for mapping development.
 - Potential partnership with Canadian and U.K. Coast Guard.
 - Potential contracting with the U.S. Army Engineer Research and Development Center, Naval Air Systems Command, or Air Force Research Laboratory for mapping requirements.

Sponsor's Rep: CG-NAV
Ops Rep: Districts

Stakeholder(s): CG-711, CG-751, CG-AUX, D9, D1

RDC Research Lead:
 Ms. Shelly Wyman, P.E.

CG-926 Portfolio Manager:
 LCDR Stephen Thomsen

Anticipated Outcome/Transition: Recommendations for Tactics, Techniques & Procedures
 Recommendations on Tech Availability & Applicability

Project Start: 1 Oct 24

| | |
|---|-----------------|
| Conduct sUAS Sensor Uncertainties Tests | Apr 25 |
| Conduct ATON Mapping Vignette | Jul 25 |
| sUAS Sensor and Mapping Analysis (Report) | Sep 25 ★ |
| Conduct Post Storm-Mapping Vignette | Sep 25 |
| sUAS PATON/ATON Verification CONOPs & TTPs (Brief) | Dec 25 ★ |
| Conduct Ice Mapping Vignette | Jan 26 |
| sUAS Post-Storm Mapping CONOPs & TTPs (Brief) | Mar 26 ★ |
| sUAS Ice Mapping CONOPs & TTPs (Brief) | Jun 26 ★ |
| Develop Mapping User Interface and Integration | Nov 26 |
| CG Auxiliary use of sUAS for ATON/PATON Verifications (Report) | Jun 27 ★ |

Project Completion: Jun 27

Project Timeline / Key Milestones

Advanced Maritime Counter-Uncrewed Aircraft System (C-UAS) Technologies

7815

Mission Need: Operationally effective C-UAS force protection capability.

Objectives

- Assess new developments in kinetic C-UAS solutions in the open market and with other government agencies as technologies evolve.
- Automate object detection and classification based on Electro-Optical/Infrared camera data by collaborating with optics companies to incorporate additional sensor modalities to aid UAS detection and target discrimination.
- Explore applicability of data fusion algorithms and machine learning to combine multiple data types into single threat track to reduce operator workload, uncertainty, and response time.
- Provide technical guidance on system employment for various mission sets based on legal authority and tactics, techniques, and procedures.



Notes

- Follow-on for RDC Project 7812, "Maritime Counter Unmanned Aircraft Systems."

Sponsor's Rep: CG-MSR
Ops Rep: D1 (dr)

Stakeholder(s): CG-711, CG-721, CG-751, LANT-3, PAC, D1, NSWC Dahlgren, CGCYBER

RDC Research Lead:
C-UAS Research Team

CG-926 Portfolio Manager:
C-UAS Research Team

Anticipated Outcome/Transition: Provide Sponsor/Product Line Tested Prototype Recommendations for Acquisition Milestone Support

Project Timeline / Key Milestones

Project Start:

Please e-mail RDC-Info@uscg.mil for information concerning the milestones and deliverable schedule.

Project Completion:



Acquisition Directorate
Research & Development Center



CG Research & Development Center
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Indicates RDC Product ★

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Mission Need: Efficient identification of high-risk cargo for targeted inspection.

Objectives

- Identify data sources such as the National Targeting Center (NTC) which can be used effectively for predictive algorithms.
- Identify existing and new indicators of deficiency risk.
- Develop a risk-based container inspection targeting program that utilizes Artificial Intelligence/Machine Learning (AI/ML).
- Look for opportunities to automate the target selection process and the dissemination of targets to CG inspection teams and Captains of the Port.
- Enable inspection teams to focus on high-risk cargo to keep deficiencies from becoming incidents.



Notes

- Driven by previous work performed in partnership between Sector NY, Stevens Institute of Technology, and Customs and Border Protection's NTC.
- Hazcheck Detect (commercial service used by NTC) is a potential benchmark.
- Leverage lessons learned in ML application from RDC Project 7532, "Improved Efficiency in Domestic Inspections" and extensive academic research on container targeting.

| | |
|---|---|
| Sponsor's Rep: CG-FAC Ops Rep: MIFC LANT | Stakeholder(s): NTC, Sector NY, Sector LA/LB, CG Container Inspection Training and Assistance Team |
| RDC Research Lead: Ms. Kathleen Rice | CG-926 Portfolio Manager: Mr. Robert Page |
| Anticipated Outcome/Transition: | Recommendations for Tactics, Techniques & Procedures Provide Sponsor/Product Line Tested Prototype |

Project Start: 1 Oct 24

| | | |
|--|---|-----------------|
| Project Timeline / Key Milestones | Virtual Kickoff Meeting with Sponsor and Stakeholders | Nov 24 |
| | Port Container Inspection Visits | Jan 25 |
| | Market Research | Jan 25 |
| | Data Preprocessing | Mar 25 |
| | Risk-based Container Inspection Targeting Algorithm Development Plan (Brief) | May 25 ★ |
| | Develop Initial AI/ML Model | Oct 25 |
| | Refine Tooling for End User | Dec 25 |
| | Demo for Sponsor and Stakeholders | Feb 26 |
| | Data Collection of System Effectiveness | May 26 |
| | Risk-based Container Inspection Targeting Program (Report) | Sep 26 ★ |

Project Completion: Sep 26

Mission Need: Navigation alternatives for the Global Positioning System (GPS).

Objectives

- Identify alternate positioning, navigation, and timing (APNT) solutions that provide robustness and resilience to platforms navigating in areas where the critical GPS signal may be spoofed or jammed, particularly in open water.
- Understand and analyze the state of research, both within the U.S. and North Atlantic Treaty Organization, regarding navigation in GPS –degraded or –denied environments.
- Partner with government and contractors to drive APNT system and sensor development and testing by providing polar research transits and operational afloat systems for testing opportunities.



Notes

- Office of Naval Research Electro-optical/Infrared Celestial Navigation efforts ongoing.
- Leverage ongoing work of Naval Surface Warfare Center Dahlgren Division, Office of Naval Research, and U.S. Fleet Forces Command, and Air Force Research Laboratory.
- Coordinate with CG-NAV and CG Navigation Center (NAVCEN) Positioning, Navigation, and Timing Working Group on alternative solutions.

Sponsor’s Rep: CG-761
Ops Rep: N/A

Stakeholder(s): CG-NAV, C5ISC, NAVCEN, CG-67, CG-68, CG-751, CG-7511, CG-9335

RDC Research Lead: APNT Research Team
CG-926 Portfolio Manager: APNT Research Team

Anticipated Outcome/Transition: Provide Sponsor/Product Line Tested Prototype Recommendations on Tech Availability & Applicability

Project Start: 1 Apr 23

| | | |
|--|---|----------------------|
| Project Timeline / Key Milestones | Perform Initial APNT Market Research | 30 Aug 24 ✓ |
| | Existing Alternatives for Navigation Positioning (Brief) | 13 Sep 24 ✓ ★ |
| | Initiate Celestial Navigation Development | Mar 25 |
| | Stationary Celestial Navigation Test | Jan 26 |
| | Stationary Celestial Navigation Test Results (Brief) | Apr 26 ★ |
| | Maritime Celestial Navigation Test | Jul 26 |
| | Maritime Celestial Navigation Test Results (Brief) | Oct 26 ★ |
| | APNT Spectrum/Redundancy Analysis | Feb 27 |
| | Alternate Navigation Positioning Sources (Report) | Jun 27 ★ |
| | Project Completion: Jun 27 | |

Mission Need: Cyber resilient Operational Technology (OT) systems on CG cutters.

Objectives

- Explore how the US Navy’s Situational Awareness Boundary Enforcement and Response (SABER) program of record for ship/carrier cyber defense could be used to monitor CG Cutter (CGC) OT systems and protect against cyber threats.
- Survey CGC OT systems and determine how SABER could be integrated with a critical OT system to improve cutter cyber resiliency.
- Perform an analysis of SABER’s ability to inform cutter crews of anomalies and cybersecurity threats to OT systems on a Fast Response Cutter (FRC) and a National Security Cutter (NSC).
- Explore, develop, and test SABER’s Boundary Enforcement and Response for the NSC’s Coast Guard Machinery Control System (CGMCS).
- Inform requirements for new acquisition systems to improve cyber resiliency for future CG assets.

Notes

- Effort aligns with Cyber Strategic Outlook 2021 Line of Effort 1: Defend and Operate the Enterprise Mission Platform, by ensuring secure and resilient OT networks on CG assets to support all missions.
- Partnerships with Naval Sea Systems Command (NAVSEA) Cyber Engineering and Digital Transformation Directorate (SEA 03) and the Naval Surface Warfare Center Philadelphia Division for a proof-of-concept demonstration on the FRC Machinery Control and Monitoring System (MCMS).
- NSC CGMCS demonstration integrates with RDC Project 1030, “Remote Diagnostic and Monitoring Systems for Technical Support Engineering.”

Sponsor’s Rep: CG-791
Ops Rep: CG Cyber D11 CPT

Stakeholder(s): CGCYBER, CG-45, CG-68, CG-751, CG-761, CG-932, CG-933, SFLC, C5ISC

RDC Research Lead:
Mr. Rob Coburn

CG-926 Portfolio Manager:
Mr. Robert Page

Anticipated Outcome/Transition: Recommendations for Product Line Tech Insertion
 Provide Sponsor/Product Line Tested Prototype



Project Start: 7 Dec 22

| | | |
|---|--|---------------------|
| Project Timeline / Key Milestones | SABER Working Group Sessions with NAVSEA 03 | 29 Mar 23 ✓ |
| | MCMS Trainer SABER Lab Test and Data Collection | 22 Nov 23 ✓ |
| | SABER Proof-of-Concept Demonstration (Brief) | 1 Apr 24 ✓ ★ |
| | FRC MCMS Pier Side SABER Test and Data Collection | 7 May 24 ✓ |
| | FRC MCMS Pier Side CGCYBER Red Team Exercise | 13 Sep 24 ✓ |
| | OT Network Situational Awareness (Report) | Mar 25 ★ |
| | NSC CGMCS SABER Validation | Sep 25 |
| | CG SABER Capability Expansion (Brief) | Mar 26 ★ |
| | NSC CGMCS Pier Side SABER Demonstration | Nov 26 |
| | Perform Analysis of Logistics for CG SABER Sustainment | Mar 27 |
| SABER Proof-of-Concept for CG Cutter Operational Technology Cybersecurity (Report) | Aug 27 ★ | |
| Project Completion: Aug 27 | | |

Mission Need: Ability to directly receive and respond to all types of mariner emergency communications.

- Objectives**
- Standardize communication pathway for all electronic emergency notifications.
 - Create table of emergency notification devices currently monitored by the CG and those coming available in the next few years to include data transmitted, signal type, and data receiver.
 - Examine how current devices are transferring emergency data to the CG or other Search and Rescue (SAR) service providers, including Search and Rescue Satellite-Aided Tracking Program (SARSAT).
 - Work with industry partners to create a prototype uniform emergency notification signal to be received by Command Centers.
 - Work with Radio Technical Commission for Maritime Services (RTCM) committees to propose a Federal standard for all maritime emergency communications, so that industry partners and other organizations can implement pathway in current and future products.



- Notes**
- Leverage RTCM special committees on Emergency Beacons, Maritime Survivor Locating Devices, and Satellite Emergency Notification and Location Devices; and integration work that SARSAT has accomplished.
 - Leverage RDC Project 1027, "Next Generation Distress Communication Capability for Alaska and the Arctic."
 - Coordinate with USAF Emergency Coordination Center and potentially with similar Canadian or British entities.
 - Utilize Cooperative Research and Development Agreements with industry.
 - Potentially collaborate with the National Association of SAR Coordinators.

| | |
|---|--|
| Sponsor's Rep: CG-SAR Ops Rep: PAC-3 | Stakeholder(s): CG-761, SILC, CG-68, C5ISC |
| RDC Research Lead: Mr. Robert Riley | CG-926 Portfolio Manager: Mr. Robert Page |
| Anticipated Outcome/Transition: | Recommendations for Standards/Regulations/Policy Recommendations on Tech Availability & Applicability |

Project Start: 1 Apr 24

| | | |
|--|---|-----------------|
| Project Timeline / Key Milestones | Kickoff Meeting with CG-SAR and Stakeholders | 14 Aug 24 ✓ |
| | Conduct Market Research of Emergency Notification Devices | Jun 25 |
| | Market Research of Emergency Notification Devices (Brief) | Jul 25 ★ |
| | Cooperative Research and Development Agreement (CRADA) with Industry Partners | Oct 25 |
| | Work with Industry to Assist in Prototype Development | May 26 |
| | Conduct Initial Research, Testing, Training, and Evaluation (T&E) with CRADA Partners | Aug 26 |
| | Conduct 2 nd Iterative T&E with CRADA Partners | Nov 26 |
| | Give Demo to Present Solution to CG-SAR and Other Government Agencies | Feb 27 |
| | Single Point Emergency Notification System (Report) | Sep 27 ★ |
| | Project Completion: Sep 27 | |

Hazardous Substance Pollution Response Technology Analysis

1033

Mission Need: Improve response readiness to hazardous substance pollution release incidents.

Objectives

- Address hazardous substance pollution risk knowledge gaps in Area Contingency Plans.
- Identify and analyze existing hazardous substance response technologies, capabilities, and resources.
- Provide reference guidance for area contingency planners.
- Enhance Captain of the Port (COTP) and Federal On Scene Coordinators (FOSC) response capabilities.
- Support inclusion of hazardous substance release response resources in facility and vessel response plans.



Notes

- Coordinate with area contingency planners to connect project focus with specific field needs.
- Engage with the U.S. Environmental Protection Agency (EPA) emergency response program, CG National Strike Force Coordination Center (NSFCC), firefighters and other local hazardous-materials responders to leverage existing hazardous substance pollution response expertise.
- Engage with D8 and LANTAREA to increase efficiency moving forward in the project.

Sponsor's Rep: CG-MER
Ops Rep: N/A

Stakeholder(s): EPA, NSFCC, FAC, NCR, CG-D8, LANTAREA, CG-721

RDC Research Lead:
Benedette Adewale, PhD

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations for Tactics, Techniques & Procedures

Project Timeline / Key Milestones

Project Start: 3 Oct 22

Complete COTP/FOSC/Other Agency Information Gathering 15 Aug 23 ✓

Hazardous Substance Pollution for Sector New Orleans Project Status (Brief) 25 Mar 24 ✓ ★

Complete Geographic Information System Layer for Sector New Orleans and Information of Hazardous Substance and facilities 28 Jun 24 ✓

Complete Request for Information Review/Research of Available Technology among Other Agencies and First Responders 12 Jul 24 ✓

Tool to Develop Hazardous Substance Locations Geographic Information System in Captain of the Port Zones (Report) Nov 24 ★

Project Completion: Nov 24



Acquisition Directorate
Research & Development Center



CG Research & Development Center
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Indicates RDC Product ★

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Mass Rescue Lifesaving Appliance (MRLSA)

Mission Need: Lightweight, easy to use, temporary, mass rescue survivor platform.

Objectives

- Find, promote, or develop the technology to manufacture an extremely compact, lightweight, rescue intervention device to safely keep 100+ persons out of the water for up to 24 hours.
- Phase 1 includes developing a prototype device and testing in a controlled environment, including weight tests, and human subject boarding exercises.
- Phase II option includes final design for testing in open water including deploying from USCG assets (air, afloat).
- Transition the developmental result to the Office of Search and Rescue and capability stakeholders for implementation as a mass rescue tool.



Notes

- Partnership with Air Force Research Laboratory.
- U.S. Department of Homeland Security (DHS) Science & Technology (S&T) funded Broad Agency Announcement for prototype development.
- Investigate National Aeronautics and Space Administration or other government agency partnership.

| | |
|---|--|
| Sponsor's Rep: CG-SAR Ops Rep: N/A | Stakeholder(s): DHS S&T, CG-711, CG-731, CG-751 |
| RDC Research Lead: Ms. Monica Cisternelli | CG-926 Portfolio Manager: Ms. Karin Messenger |
| Anticipated Outcome/Transition: | Provide Sponsor/Product Line Tested Prototype Recommendations for Standards/Regulations/Policy |

Project Timeline / Key Milestones

| | |
|--|----------------------|
| Project Start: 1 Oct 19 | |
| Request for Information/Technology Assessment Complete | 1 Mar 20 ✓ |
| MRLSA: Market Research Summary (Report) | 13 May 20 ✓ ★ |
| Industry Day Webinar Complete | 25 May 21 ✓ |
| DHS Issues BAA | 21 Jun 21 ✓ |
| Interim Brief Complete | 28 Sep 21 ✓ |
| MRLSA: Phase 1 Consensus Results (Brief) | 30 Mar 22 ✓ ★ |
| DHS Contract Award | 12 Sep 22 ✓ |
| Prototype Development Complete, Phase 1 Testing | 19 Apr 24 ✓ |
| MRLSA: Phase 1 Test Results (Brief) | 19 Jul 24 ✓ ★ |
| Phase 2 Testing | Mar 25 |
| Mass Rescue Lifesaving Appliance (Report) | Jun 25 ★ |
| Project Completion: Jun 25 | |

Evaluate Visibility of Colors for CG Approved Lifesaving Equipment in Marine Conditions

Mission Need: Optimal lifesaving equipment detectability.

Objectives

- Conduct literature review of High Visibility Safety Apparel (HSVA) and lifesaving equipment visibility/probability of detection research.
- Carry out industry/professional society review of standards for HSVA and Search and Rescue (SAR) equipment colors and/or color schemes.
- Perform domestic and international governmental review of approved/required colors in SAR scenarios.
- Define optimal visual detectability and conspicuity color characteristics in marine conditions via a marine environment high visibility color standard.
- Conduct field trials to validate high visibility color standard from shore, afloat and aviation assets in various weather, light and sea-state conditions.
- Enable sponsor and stakeholders to use for lifesaving equipment color evaluations and standards revision, if appropriate.



Notes

- Engage RDC Human Factors Subject Matter Experts and CG-926 Portfolio Manager, as well as CG Aux for experiment support.
- Review previous RDC visibility, visual distress signal, and detectability projects for experiment techniques, findings and conclusions.
- Involve global maritime stakeholders in results review for possible revisions to international policy and regulations.
- Leverage DOD, North Atlantic Treaty Organization, Maritime Administration, and Cruise Lines Industry Association interest.

Sponsor's Rep: CG-ENG
Ops Rep: N/A

Stakeholder(s): CG-BSX, CG-5P, CG-5R, CG-711, CG-731, CG-751, WOPL, NMC, NBSAC, IMO NCSR

RDC Research Lead:
Mr. Josh Pennington

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations for Standards/Regulations/Policy

Project Timeline / Key Milestones

| | |
|---|----------------------|
| Project Start: 3 Oct 22 | |
| Technical Review | 8 Mar 23 ✓ |
| Lifesaving Equipment Colors; Literature Review (Report) | 19 Jul 23 ✓ ★ |
| Research & Define Color Characteristics | 27 Oct 23 ✓ |
| Objective Metrics for Lifesaving Equipment Color Characteristics (Report) | 6 Jun 24 ✓ ★ |
| KDP – Sponsor Concurrence on Color Characteristics | 14 Jun 24 ✓ |
| Field Trial Test Plan | 30 Aug 24 ✓ |
| Field Trials Complete | Apr 25 |
| Data Analysis Complete | Jun 25 |
| Visibility of Potential Colors for CG Approved Lifesaving Equipment (Report) | Sep 25 ★ |
| Project Completion: Sep 25 | |

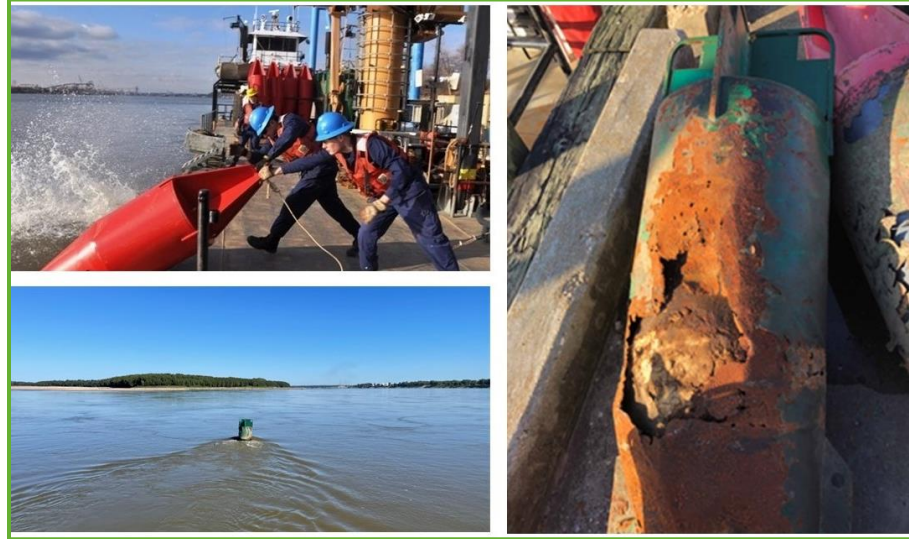


Sustainable Use of Foam and Plastic Materials in Western Rivers Buoy Construction

Mission Need: An environmentally sound solution for plastic foam in river ATON buoys.

Objectives

- Determine if there is a cost-efficient alternative to the plastic foam used in river buoys that provides similar performance characteristics but naturally degrades over time and minimizes plastic waste in the environment.
- Develop and test a river buoy prototype(s) with a sustainable foam alternative(s).



Notes

- Engage with industry developing sustainable, bio-degradable plastic alternatives.
- Use results of RDC Project 2703, “Next Generation Aids to Navigation Buoys & Alternative Moorings,” to identify commercially available solutions.
- Partner with government labs (Air Force Research Laboratory, Naval Research Laboratory, Environmental Protection Agency, etc.) or CG Academy.

Sponsor’s Rep: SILC-WOPL
Ops Rep: D8 (dpw)

Stakeholder(s): CG-NAV, Districts (dpw), CG-47, AREAs

RDC Research Lead:
 Dr. Benedette Adewale

CG-926 Portfolio Manager:
 Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability
 Provide Sponsor/Product Line Tested Prototype

Project Start: 1 Oct 24

| | | |
|--|---|-----------------|
| Project Timeline / Key Milestones | Investigate Current River Buoy Manufacturing, Operations, and Disposal Processes | Nov 24 |
| | Identify Sustainable Buoy Foam and Plastic Materials | Jan 25 |
| | Sustainable Buoy Foam and Plastic Materials Market Research Update (Brief) | Mar 25 ★ |
| | Key Decision Point – Path Forward on Sustainable Foam Alternatives & Buoy Prototyping | Mar 25 |
| | Develop River Buoy Prototype with Foam Alternative at CG Industrial Facility | Jun 25 |
| | Start Lab & Field Trials – River Buoy Prototype | Jun 25 |
| | Complete Lab & Field Trials – River Buoy Prototype | May 26 |
| | Sustainable Buoy Foam and Plastic Materials Summary (Report) | Aug 26 ★ |
| | Project Completion: Aug 26 | |

Climate Change Impacts on Regulated Waterfront Facilities and Near-Shore Infrastructure

Mission Need: A service solution to climate change impacts on regulated facilities and bridges.

- Objectives**
- Provide a visualization-based method(s) for analyzing future sea-level rise, flooding, and inundation impacts on regulated shoreside infrastructure and bridge navigational clearances.
 - Identify available governmental and academic fine resolution models to analyze detailed impacts at individual locations.
 - Use an example-based methodology to apply model(s) to U.S. Coast Guard (CG) Concept of Operations and analyze impacts of a few representative storm events.
 - Identify functional attributes and framework on how to apply the model(s) for widespread CG use.
 - Develop a prioritized list of major ports and waterways that will benefit from this capability.
 - Verify and validate model outputs.



- Notes**
- Leverage federal and academic partners:
- Department of Homeland Security (DHS) Coastal Resilience Center of Excellence at University of North Carolina Chapel Hill,
 - University of Rhode Island CHAMP,
 - DHS Federal Emergency Management Agency,
 - National Oceanic and Atmospheric Administration,
 - U.S. Army Corps of Engineers, and
 - National Aeronautics and Space Administration.

Sponsor's Rep: CG-FAC
Ops Rep: Sectors SENE & LIS

Stakeholder(s): CG-BRG, CG-MER, CG-437, CG-741, AREAs

RDC Research Lead:
 Mr. James Spilsbury

CG-926 Portfolio Manager:
 Ms. Karin Messenger

Anticipated Outcome/Transition: Provide Sponsor/Product Line Tested Prototype Recommendations for Tactics, Techniques & Procedures

Project Start: 1 Oct 24

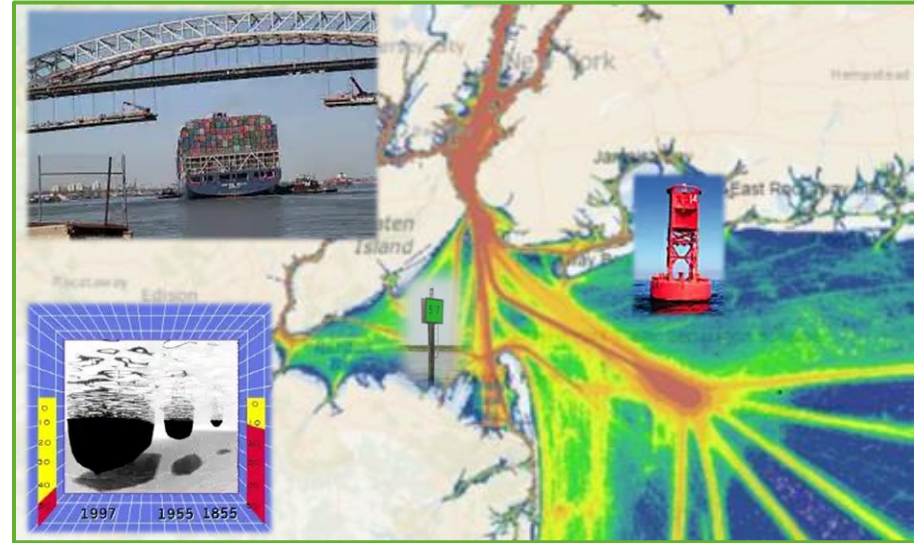
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|---|-----------------|
| Investigate Existing Climate Resiliency Models and Tools | Dec 24 |
| Complete Literature Review | Feb 25 |
| Identify Functional Characteristics of CG Climate Resiliency Tool(s) | Mar 25 |
| Literature Review - Climate Resiliency & Sea Level Rise Tools (Brief) | Jun 25 ★ |
| Key Decision Point – Path Forward on Climate Resiliency Tool Development for Enterprise | Jun 25 |
| Award Contract for Climate Resiliency Tool Development | Aug 25 |
| Complete Beta Testing of Climate Resiliency Tool | Oct 26 |
| Climate Resiliency & Sea Level Rise Tool (Visualization Tool & Summary Report) | Dec 26 ★ |
| Project Completion: Dec 26 | |

Improve Efficiency and Resiliency in Aids to Navigation (ATON) System Design

Mission Need: Modernize ATON design standards for the future.

Objectives

- Identify the functional characteristics of the current and future Marine Transportation System needed to be included in ATON system design.
- Identify and review existing CG and international guidelines, studies, and tools on ATON system design.
- Analyze current ATON physical characteristics (lighting, visual, radar signatures and effective ranges).
- Update 1990's-based ATON system design tool standards to reflect the physical characteristics of modern ATON, the characteristics of modern vessels (e.g., increased draft and size), or the emergence of electronic navigation technologies in use today.
- Develop a quantitative, Geographic Information System (GIS)-based tool to aid decision makers with modernizing ATON system design under a range of operating scenarios.



Notes

- Leverage the Coast Guard Academy Ship Control and Navigation Training Simulator.
- Leverage Department of Homeland Security Science and Technology efforts on novel waterway use risks and ATON system resilience.
- Collaborate with U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, and maritime industry partners.
- Leverage International Association of Marine Aids to Navigation & Lighthouse Authorities and international partners' work (through DCO-I).
- Leverage previous RDC ATON risk assessment work.

Sponsor's Rep: CG-NAV
Ops Rep: Districts (dpw)

Stakeholder(s): CG-5PW, WWM, NAVCEN, SILC-WOPL, CG-68, CG-761

RDC Research Lead:
Mr. James Spilsbury

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/Transition: Recommendations for Tactics, Techniques & Procedures
Provide Sponsor Tested Prototype

Project Timeline / Key Milestones

| | |
|---|-----------------|
| Project Start: 1 Apr 24 | |
| Identify Existing Tools, Guidelines, and Studies used for ATON System Design | Oct 24 |
| Complete Literature Review | Nov 24 |
| Develop Test Plan for Additional Studies Required | Nov 24 |
| Literature Review of ATON System Design (Brief) | Dec 24 ★ |
| Key Decision Point 1 – Path Forward on Methodology for Modernizing ATON System Design | Dec 24 |
| ATON System Design Summary (Report) | Oct 26 ★ |
| Key Decision Point 2 - Continue to ATON System Design Visualization Tool Development | Oct 26 |
| Complete Beta Testing of ATON System Design Tool | Dec 26 |
| ATON System Design Tool (GIS Layer & User Guide) | Mar 27 ★ |
| Project Completion: Mar 27 | |



Mission Need: Determine the impacts of windfarms on search and rescue operations.

Objectives

- Literature review and workshop with sponsor and stakeholders to determine current state of wind farms and SAR impacts.
- Collect and analyze real-time wind and current measurements to determine impact of changes due to wind turbines on wind farms with Leeway Drift Studies.
- Research, verify and implement updates to atmospheric and oceanographic models to account for wind farms.
- Conduct modeling and field tests to determine the impact to search object detection using prioritized sensors at US or United Kingdom (UK) based wind farm.



Notes

- Partnership with the Bureau of Safety and Environmental Enforcement, U.S. Coast Guard Academy, National Oceanographic and Atmospheric Administration Integrated Ocean Observing System and, with the Bureau of Ocean Energy Management.
- International partners (UK, Denmark, Norway, Dutch, Sweden).
- Possible collaboration with the State of NY Maritime College - SUNY Maritime.
- Leverage Maritime Risk Symposium.

Sponsor's Rep: CG-SAR
Ops Rep: LANT-3

Stakeholder(s): NAVCEN, CG-NAV, CG-MER, CG-711/731/751/741/761, LANT, D1, FORCECOM

RDC Research Lead:
LT Brian Hwang

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations for Standards/ Regulations/Policy

| | |
|---|-----------------|
| Project Start: 3 Oct 22 | |
| UK Leeway Drift | 24 Mar 23 ✓ |
| US Leeway Drifts: Pre – Construction of Turbines | 3 May 24 ✓ |
| Investigate Effects of Wind Farms on Search Planning: FY24 Annual Update (Brief) | Nov 24 ★ |
| Overseas Leeway Drifts: UK and Baltic Sea | May 25 |
| US Leeway Drifts: Post – Construction | Oct 25 |
| Investigate Effects of Wind Farms on Search Planning: FY25 Annual Update (Brief) | Oct 25 ★ |
| Detection Modeling and Experiments | May 26 |
| Investigate Effects of Wind Farms on Search Planning: FY26 Annual Update (Brief) | Oct 26 ★ |
| Investigate Effect of Wind Farms on Search Planning (Report) | Aug 27 ★ |
| Project Completion: Aug 27 | |

Project Timeline / Key Milestones

Fire Testing of Fiber-reinforced Plastic (FRP) Commercial Vessel Category A-60 Boundaries

Mission Need: Address fire-safety knowledge gaps concerning use of FRP for A-60 boundaries.

- Objectives**
- Provide comprehensive FRP boundary fire-testing data to fire protection engineers in CG-ENG-4 to assess the viability of FRP for use in the construction of A-60 or other classed (e.g., A, B, or F class) boundaries.
 - Inform Marine Safety Center (MSC) staff engineers for technical analysis of FRP A-60 boundaries in vessel design during plan review.
 - Provide guidance to CG commercial vessel regulatory and compliance offices for policy and regulatory consideration.
 - Provide guidance to CG platform managers for future policy and procurement consideration.
 - Enhance vessel safety and emergency fire response through an enhanced understanding of FRP in fire scenarios.
 - Support knowledge transfer to global organizations including the International Maritime Organization (IMO).



- Notes**
- Leverage FRP fire testing projects conducted by U.S. Department of Defense (DOD) and U.S. Department of Energy (DOE).
 - Engage community of interest: CG fire protection engineers; DOD, DOE, Bureau of Alcohol, Tobacco, Firearms and Explosives, and other government agencies; National Fire Protection Association; classification societies; marine fire and salvage; etc.

| | |
|--|--|
| Sponsor's Rep: CG-ENG Ops Rep: Districts (dpi) (dr) | Stakeholder(s): CG-5P, CG-5R, CG-731, CG-751, CG-LMI, MSC, CGA, DOE, IMO, MARAD |
| RDC Research Lead: Mr. Josh Pennington | CG-926 Portfolio Manager: Ms. Karin Messenger |
| Anticipated Outcome/Transition: | Recommendations for Standards/Regulations/Policy Recommendations on Tech Availability & Applicability |

Project Start: 1 Oct 24

| | | |
|--|--|-----------------|
| Project Timeline / Key Milestones | Issue FRP Request for Information (RFI) to Industry | Dec 24 |
| | Knowledge, Policy, & Regulatory Gap Analysis Complete | Dec 24 |
| | FRP Use in "A" Class Boundaries Knowledge Gap Analysis (Brief) | May 25 ★ |
| | FRP "A" Class Boundary Request for Information Submission Summary (Brief) | May 25 ★ |
| | Commence Small-Scale FRP Fire Testing | May 25 |
| | Results of Small-Scale FRP "A" Class Boundary Fire Testing (Report) | Jul 26 ★ |
| | KDP – Sponsor to Determine Project Continuation | Aug 26 |
| | Commence Full-Scale FRP Fire Testing | Nov 26 |
| | Results of Full-Scale FRP "A" Class Boundary Fire Testing (Report) | Feb 28 ★ |
| | Project Completion: Feb 28 | |



Mission Need: Response guidance for alternative fuels discharges and spills.

Objectives

- Determine discharge/incident risks for alternative fuels.
- Examine incident likelihood (probability) by alternative fuel type, then identify safety hazards and potential environmental damage (consequences).
- Evaluate adequacy of existing oil spill response equipment and strategies for alternative fuel spills/incidents.
- Depending on available information, test the effectiveness of existing oil spill response technologies with identified alternative fuels at a test facility.
- Provide Federal On-Scene Coordinator (FOSC) guidance for alternative fuels spill response.



Notes

- Engage community of interest: U.S. Coast Guard (CG) District Response Advisory Teams, CG Sectors, and Regional Response Teams.
- Coordinate with Oil Spill Removal Organizations, FOSCs, and other pollution response organization interest.
- Potential synergies with RDC Project 1046, “Enhance Understanding of Fire Protection and Safety Measures for Alternative Energy in the Maritime Environment.”

Sponsor’s Rep: CG-MER
Ops Rep: D1 (dp)

Stakeholder(s): CG-721, CG-ENG, NSFCC, ICCOPR, District Response Advisory Teams, FOSCs, AREAs

RDC Research Lead:
Mr. Alexander Balsley, P.E.

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability
Recommendations for Cost/Risk Avoidance

Project Timeline / Key Milestones

| | |
|---|-----------------|
| Project Start: 1 Oct 24 | |
| Conduct Market Research of Alternative Fuels | Jan 25 |
| Existing and Emerging Alternative Fuels and their Properties (Brief) | Apr 25 ★ |
| Consult with Alternative Fuels Subject Matter Experts to Ensure Collection of Relevant Information | Oct 25 |
| Carry Out Additional Literature Review to Identify Hazards and Response Strategies for Selected Alternative Fuels | Apr 26 |
| Risks and Response Strategies for Selected Alternative Fuels: Reference Guide (Report) | Nov 26 ★ |
| Spill Response Equipment Evaluation at Test Facility | Jul 27 |
| Develop Test Report | Jan 28 |
| Spill Response Equipment Evaluation: Mechanical Recovery, Alternative Fuels (Report) | Mar 28 ★ |
| Project Completion: Mar 28 | |



Enhance Understanding of Fire Protection and Safety Measures for Alternative Energy in the Maritime Environment

Mission Need: Address vessel and personnel safety knowledge gaps concerning lithium-ion batteries.

Objectives

- Inform fire mitigation strategies, suppression technologies, shipboard battery storage space classifications, and emergency response actions through marine lithium-ion (li-ion) battery literature review.
- Determine effect of differing marine li-ion battery chemical properties, configuration, and quantity on fire behavior and propagation.
- Identify knowledge, policy, and regulatory gaps in safety, fire protection, and vessel survivability for marine li-ion and maritime alternative fuels.
- Assist sponsor in developing fire experimental test plans to address fire risks, personnel hazards, optimal fire suppression procedures, and post-fire safety guidelines.
- Conduct laboratory li-ion battery fire testing to develop fire data for advanced fire modeling and marine li-ion battery hazard categorization.
- Inform future policy, procurement, and regulatory considerations among CG-ENG, CG-5RI, and CG platform managers through literature review and fire-test data analysis.



Notes

- Review previous and ongoing RDC alternative energy projects.
- Engage community of interest including RDC power/propulsion project staff; CG fire protection engineers; U.S. Department of Defense, U.S. Department of Transportation (DOT), U.S. Department of Energy, and other government agencies; classification societies; marine fire and salvage; maritime industry leaders, etc. to leverage expertise.
- International Maritime Organization (IMO), DOT, Maritime Administration and first responder organization interest.

Sponsor's Rep: CG-ENG
Ops Rep: Districts (drm) (dpi)

Stakeholder(s): CG-5P, CG-5R, CG-5PS, CG-45, CG-47, CG-731, CG-751, CG-LMI, MSC, DOT, IMO

RDC Research Lead:
Mr. Josh Pennington

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/Transition: Recommendations for Standards/Regulations/Policy
Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

| | | |
|---|---------------|---|
| Project Start: 1 Apr 24 | | |
| Marine Li-ion Battery Literature Review Complete | Apr 25 | |
| Marine Lithium-ion Battery Literature Review (Report) | Jul 25 | ★ |
| Marine Li-ion Battery Fire Test Plan Complete | Nov 25 | |
| Li-ion Battery Fire Testing (FY26) – Phase I Complete | Jun 26 | |
| Lithium-ion Battery Fire Testing – Phase I (Report) | Dec 26 | ★ |
| Li-ion Battery Fire Testing (FY27) – Phase II Complete | Jul 27 | |
| Lithium-ion Battery Fire Testing – Phase II (Report) | Feb 28 | ★ |
| Marine Li-ion Battery Hazard Classification System Complete | May 28 | |
| Marine Lithium-ion Battery Hazard Classification System (Report) | Sep 28 | ★ |
| Project Completion: Sep 28 | | |



Night and Low Visibility Conditions Technologies to Detect Oil Spills

1051

Mission Need: Overcome oil spill detection limitations during darkness and low visibility conditions.

Objectives

- Determine the most suitable sensor or combination of sensors that will allow oil detection in darkness or reduced visibility conditions.
- Provide attributes and limitations of each sensor type for determining what sensor or sensor suite is most appropriate for U.S. Coast Guard (CG) field use.
- Incorporate this information in an easy reference guide for CG-MER and Federal On-Scene Coordinators.
- Improve the speed and scale of oil spill response in night and low visibility conditions.



Notes

- Defense Innovation Unit Experimental India-U.S. Defense Acceleration Ecosystem prize challenge.
- The range of application should include sensors that are satellite based, vessel or aircraft mounted, small Uncrewed Systems payload, and handheld.
- Leverage work done by the Bureau of Safety and Environmental Enforcement, other agencies, and Naval Postgraduate School.

Sponsor's Rep: CG-MER
Ops Rep: NSFCC

Stakeholder(s): CG-741, CG-721, CG-OEM, CG-NSF, AREAs, NOAA, D9 DRAT, GLCOE

RDC Research Lead:
Mr. Michael Wurl

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability
Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 24

| | | |
|---|---------------|---|
| Complete Literature Review on Existing Research/Use for Night and During Low Visibility Oil Detection | Feb 25 | |
| Literature Review: Night and Low Visibility Oil Detection Capabilities and Research (Report) | Mar 25 | ★ |
| Complete Market Research on Available Sensors that can Detect Oil at Night or During Low Visibility | Aug 25 | |
| State of the Market of Night/Low Visibility Sensors and Sensors Chosen for Testing (Brief) | Oct 25 | ★ |
| Complete Sensor Purchases/Agreements | Jan 26 | |
| Saltwater Sensor Testing in Low Light and Poor Visibility | Nov 27 | |
| Night and Low Visibility Oil Detection: Results of Saltwater Experimentation (Brief) | May 28 | ★ |
| Freshwater Sensor Testing in Low Light and Poor Visibility | Nov 28 | |
| Night and Low Visibility Oil Detection: Results of Freshwater Experimentation (Brief) | Jun 29 | ★ |
| Effectiveness of Sensors to Detect Oil in Low Light and Poor Visibility Conditions (Report) | Jul 29 | ★ |

Project Completion: Jul 29



Acquisition Directorate
Research & Development Center



CG Research & Development Center
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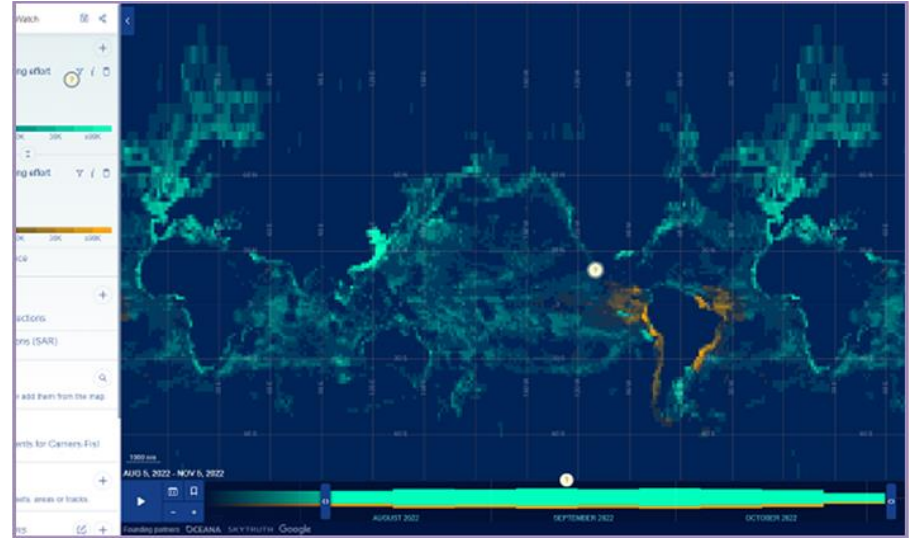
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ArcGIS Enterprise Integration of IUU Fishing Detection Information

Mission Need: Integrate and display IUU fishing activity for Maritime Law Enforcement operations.

- Objectives**
- Determine requirements for Illegal, Unreported and Unregulated Fishing (IUUF) Activity detection and display.
 - Determine existing and needed sources/sensors/inputs for IUU Fishing display on an Environmental Services Research Institute (ESRI) platform.
 - Investigate creation of an ESRI platform that captures and manages data input for C-IUUF.
 - Create repeatable and adaptable process for all geographic locations that support C-IUUF.



- Notes**
- Leverage previous RDC and Maritime Intelligence Fusion Center IUU work as much as possible.
 - Explore the link between historical and real-time data within the ESRI system.
 - Identify how content and format of data sources come together within the ESRI system. Determine what kind of information would increase system effectiveness.

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| Sponsor's Rep: CG-MLE Ops Rep: PAC-53 | Stakeholder(s): CG-2, CG-68, MIFC LANT/PAC, ICC, D14, D17, CGCYBER |
| RDC Research Lead: Mr. Jack Cline | CG-926 Portfolio Manager: Mr. Robert Page |
| Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability Provide Sponsor/Product Line Tested Prototype | |

Project Timeline / Key Milestones

| | |
|--|----------------------|
| Project Start: 1 Oct 21 | |
| AIS Data Quality/Analysis Investigation | 31 Aug 22 ✓ |
| IUU Requirements Determined | 16 Dec 22 ✓ |
| ArcGIS Data Integration Status Update (Brief) | 29 Mar 23 ✓ ★ |
| First Round Prototype Development | 24 Nov 23 ✓ |
| Prototype Demonstration | 15 Dec 23 ✓ |
| Prototype Revision | 31 Jan 24 ✓ |
| The Use of ArcGIS to Detect and Display IUU Fishing Activity (Report & Brief) | Dec 24 ★ |
| Project Completion: Dec 24 | |

Next Generation Distress Communication Capability for Alaska and the Arctic

Mission Need: Effective and modernized distress communications for Alaska and Arctic.

- Objectives**
- Evaluate current environmental and geographic challenges of the existing emergency communications system, Rescue 21 (R21) Alaska, in D17.
 - Identify potential i911 integration opportunities with commercial Satellite (SAT) phones.
 - Support U.S. Department of Homeland Security (DHS) Science and Technology Directorate’s (S&T) satellite payload testing for Digital Selective Calling (DSC) relay.
 - Perform testing of new Iridium Global Maritime Distress and Safety System (GMDSS) and aid in the integration and training of command centers.



- Notes**
- Leverage findings from RDC Project 8503, “Radio Frequency (RF) Communications in a Cloud Environment.”
 - Leverage partnerships within the U.S. Department of Defense (DOD) and DHS for alternative distress communications methods.
 - Identify possible synergies with the DOD Lab Commander Sync and seek to leverage the Ted Stevens Center for Arctic Security Studies.
 - Liaise with International partners to include Canadian Coast Guard/ Defense Research and Development Canada (DRDC).

Sponsor’s Rep: CG-761
Ops Rep: N/A

Stakeholder(s): CG-68, CG-67, CG-741, CG-SAR, C5ISC, CGCYBER, AFRL, Space Force, DHS S&T

RDC Research Lead:
 LT Clifford Rosenberg

CG-926 Portfolio Manager:
 Mr. Robert Page

Anticipated Outcome/ Transition: Recommendations in Tech Availability & Applicability

Project Start: 3 Oct 22

| | |
|---|----------------------|
| Initial Cellular-Over-Satellite D17 Field Demonstration | 31 Aug 23 ✓ |
| Conclude Cellular-Over-Satellite Market Research | 31 Aug 23 ✓ |
| Arctic Demonstration of Iridium GMDSS on HEALY | 31 Oct 23 ✓ |
| Cellular-Over-Satellite Market Research (Brief) | 27 Nov 23 ✓ ★ |
| DHS S&T/Aerospace Satellite Capability Alternative Analysis (Report) | Feb 25 |
| Next Generation Distress Communication Capability for Alaska and the Arctic (Report) | May 25 ★ |

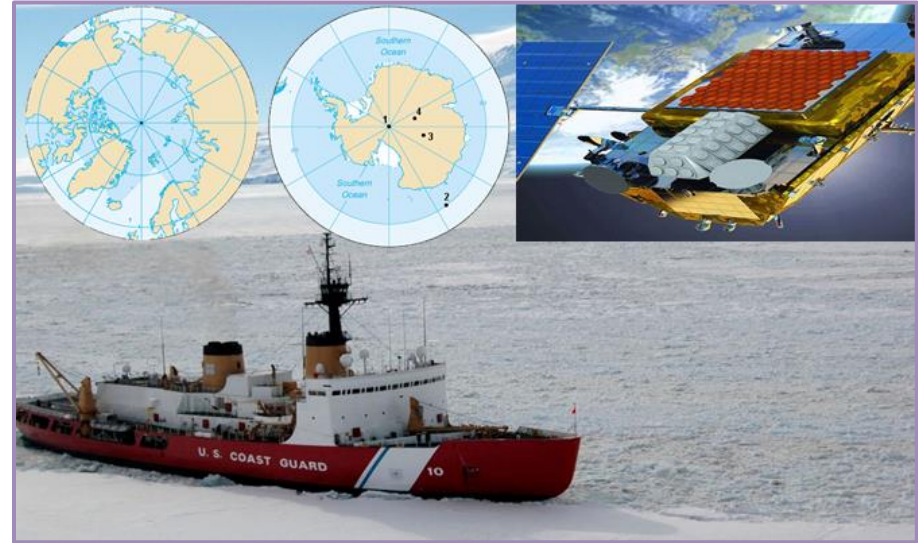
Project Completion: May 25

Project Timeline / Key Milestones

Mission Need: Provide network connectivity to Cutters operating at high latitudes.

Objectives

- Influence the desired minimum connectivity functional characteristics by analyzing previous U.S. Coast Guard (CG) Research and Development Center (RDC) arctic communications and cutter connectivity projects within last 10 years.
- Influence the desired minimum connectivity functional characteristics by analyzing prior U.S. Department of Defense (DOD) High Latitude (Hi-Lat) research projects within last 10 years, including U.S. Navy (USN) and North Atlantic Treaty Organization Combined Joint Operations from the Sea.
- Deploy a prototype solution and perform a limited user evaluation and report on system capabilities.



Notes

- Leverage RDC Projects 6208, “Arctic Communications Technology Assessments,” 8702, “Evaluate Network Accelerator Technology to Improve Cutter Information Technology Performance,” and 7759, “Evaluation of Potential CG Use of CubeSats.”
- Partner with the U.S. Department of Homeland Security Science and Technology Directorate; Command, Control, Communications, Computers, Cyber, and Intelligence Service Center (C5ISC) Deployed Connectivity Section; Air Force Research Lab; Naval Information Warfare Center.
- Inform C5ISC SATCOM procurement.
- Link with DOD Lab Sync Arctic Comms effort and International Cooperative Engagement Program for Polar Research.

| | |
|---|---|
| Sponsor’s Rep: CG-761 | Stakeholder(s): CG-67, CG-68, CG-751, C5ISC, |
| Ops Rep: AREA-6 | ALC, CGCYBER |
| RDC Research Lead: Mr. Jon Turban, P.E. | CG-926 Portfolio Manager: Mr. Robert Page |

Anticipated Outcome/Transition: Provide Sponsor/Product Line Tested Prototype Recommendation for Acquisition Milestone Support

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|--|--|----------------------|
| Project Timeline / Key Milestones | Project Start: 1 Oct 20 | |
| | Review of Previous Projects and Research Completed | 18 Mar 21 ✓ |
| | High Latitude Satellite Systems Market Research Completed | 18 Mar 21 ✓ |
| | High Latitude Underway Connectivity – Status Update (Brief) | 12 Aug 21 ✓ ★ |
| | High Latitude Underway Connectivity – Status Update 2 (Brief) | 5 Oct 23 ✓ ★ |
| | Cooperative Research & Development Agreement (CRADA) Established | 10 Jun 24 ✓ |
| | CGC POLAR STAR Hughes (OneWeb) CRADA Complete | Mar 25 |
| | Limited User Evaluation Complete | Mar 25 |
| | High Latitude Underway Connectivity – Final Report (Report) | May 25 ★ |
| | Project Completion: May 25 | |



Evaluation and Testing of VHF Data Exchange System (VDES) Impacts on the Automatic Identification System (AIS)

8703

Mission Need: Determine VDES benefits and path to implementation to support CG operations.

Objectives

- Understand the capabilities and limitations of VDES.
- Identify steps for U.S. Coast Guard (CG) Implementation of VDES.
- Identify steps to shift CG tactical data transmissions from AIS channels to VDES application specific message channels.
- Evaluate VDES capabilities to disseminate various types of Maritime Safety Information (MSI).
- Understand the requirements for CG shore-side management of VDES.
- Develop AIS/VDES-transmit application to disseminating search patterns.
- Assess feasibility, accuracy and technical limitations of VDES Ranging Mode (R-Mode) implementation in the United States.
- Investigate the ability to use VDES R-Mode to detect position spoofing efforts by bad actors.
- Evaluate VDES satellite capabilities and limitations for transmitting MSI in the high-latitudes, offshore, and other remote regions.

Notes

- Work closely with the Canadian Coast Guard; Electronics and Information Services, Quebec; U.S. Army Corps of Engineers, Engineer Research & Development Center.
- Leverage prior CG Research and Development Center work completed concerning options and impacts for VDES and AIS.
- Establish Cooperative Research and Development Agreement with VDES satellite commercial providers on test evaluation.

Sponsor's Rep: CG-761
Ops Rep: D1

Stakeholder(s): CG-67, CG-68, CG-933, CG-NAV, NAVCEN, C5ISC, CGCYBER

RDC Research Lead:
LCDR Ryan Cassidy

CG-926 Portfolio Manager:
Mr. Robert Page

Anticipated Outcome/Transition: Recommendations for Standards/Regulations/Policy
Recommendations for Product Line Tech Insertion



Project Timeline / Key Milestones

Project Start: 1 Oct 19

| | |
|--|----------------------|
| Technology Roadmap Investigation Complete | 30 Sep 20 ✓ |
| Very High Frequency Data Exchange System (VDES) Technology Roadmap (Report) | 27 Jan 21 ✓ ★ |
| Phase 1 Field Trials – VDES Evaluation of CG Tactical Data Transmission | 1 Oct 21 ✓ |
| Sensitive but Unclassified Tactical Information Exchange and Display System Using VDES (Report) | 13 Dec 21 ✓ ★ |
| Phase 2 Field Trials – VDES Evaluation of the Dissemination of MSI | 8 Dec 22 ✓ |
| Disseminating MSI Using VDES Field Trial Summary (Report) | 22 Mar 23 ✓ ★ |
| VDES R-Mode Field Trial Update (Brief) | Jan 25 ★ |
| Complete Phase 3 & Phase 4 Field Trials – Evaluation of R-Mode & VDES-Satellite | Dec 25 |
| VDES R-Mode and Satellite Field Trial Summary (Report) | May 26 ★ |
| Project Completion: May 26 | |



Acquisition Directorate
Research & Development Center



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Mission Need: Comprehensive and cohesive dispatch system to enhance effectiveness of CG operations.

Objectives

- Capability and limitation understanding of candidate Search and Rescue (SAR) systems from a technical integration and intercommunications standpoint.
- Comprehensive knowledgebase of capabilities of Commercial Off-The-Shelf (COTS) Computer Aided Dispatch (CAD) solutions.
- Compatibility understanding of candidate SAR systems with COTS CAD solutions based on SAR system capability evaluation.
- Feasibility understanding of the implementation of a CAD system in Coast Guard command centers.
- Concept of operations plan based on feasibility assessment.
- Ready design for potential Coast Guard integration of a CAD system to include interface design and control documentation.



Notes

- Computer Aided Dispatch project is related to project Minerva. CAD project will need to be cognizant of the direction and outcome of Minerva.
- Partner with Next Generation (NG) 911 call centers, including the U.S. Department of Defense base dispatch centers to determine a best fit for CG operations. Possible use of a Cooperative Research and Development Agreement with NG 911 vendors.
- Leverage prior RDC Project 8112, "Maritime Smartphone Public Safety Answering Point (PSAP) Forwarding into CG-IT/Rescue21."

| | |
|---|---|
| Sponsor's Rep: CG-SAR Ops Rep: N/A | Stakeholder(s): CG-68, CG-67, CG-741, C5ISC, CGCYBER |
| RDC Research Lead: LT Clifford Rosenberg | CG-926 Portfolio Manager: Mr. Robert Page |

Anticipated Outcome/Transition: Recommendations for Product Line Tech Insertion
Recommendations for Cost/Risk Avoidance

| | | |
|--|--|-----------------|
| Project Timeline / Key Milestones | Project Start: 1 Apr 24 | |
| | Complete Candidate Systems Capability Analysis | Dec 24 |
| | Complete COTS CAD Systems Capability Market Research | Dec 24 |
| | Candidate Systems and Computer Aided Dispatch Compatibility and Feasibility (Brief) | Mar 25 ★ |
| | Complete Development of Concept of Operations Plan | May 25 |
| | Request for Information Responses Received from Potential Software Vendors | Sep 25 |
| | Complete Contract Action for Interface and Control Design Development | Jan 26 |
| | Receive Vendor Interface and Control Design | Jan 27 |
| | Computer Aided Dispatch Design and Interface Control Documents (Report) | Mar 27 ★ |
| | Project Completion: Mar 27 | |



Mission Need: Increase Maritime Domain Awareness (MDA) through space-based RF detection.

- Objectives**
- Recommendations on technology applicability and workflow procedures.
 - Provide a roadmap to utilize promising space sensor tech.
 - Determine Space-Based RF detection and display requirements.
 - Investigate existing Space-Based RF detection capabilities.
 - Identify business use cases to use Government-Off-The Shelf (GOTS)/Commercial-Off-The Shelf (COTS) solutions for real-world missions (SAR; Illegal, Unreported and Unregulated Fishing; drug interdiction; migrant ops).
 - Develop mitigation strategies for identified gaps and analyze workflows and procedures.
 - Investigate the capabilities of U.S. Coast Guard (CG) systems to display Space-Based RF detection information and assess the scope of displaying data to provide actionable information.



- Notes**
- National Reconnaissance Office, National Security Agency, Air Force Research Laboratory, Space Force collaboration.
 - Leverage Defense Innovation Unit Hybrid Space Architecture II project.
 - Leverage joint DHS S&T/RDC Digital Selective Calling detection from space effort under RDC Project 1027, "Next Generation Distress Communication Capability for Alaska and the Arctic."

| | |
|--|---|
| Sponsor's Rep: CG-2D Ops Rep: Sector Boston | Stakeholder(s): CG-2AI, CG-68, CG-MLE, MIFC, AREAS |
| RDC Research Lead: Mr. Paul Harvey | CG-926 Portfolio Manager: Mr. Robert Page |

Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability
Recommendations for Tactics, Techniques & Procedures

Project Start: 1 Oct 24

| | | |
|---|---|-----------------|
| Project Timeline / Key Milestones | Determine Space-based RF Detection Capabilities | Jun 25 |
| | Determine Requirements for Data Display | Sep 25 |
| | Space-based RF Detection Workflow Analysis | Jul 26 |
| | Space-based RF Detection Status Update (Brief) | Sep 26 ★ |
| | Hardware and Software Requirements | Oct 26 |
| | Develop Display Method for Data Collected | Jul 27 |
| | Automate Ingestion and Display of Target Data | Dec 27 |
| | Space-based RF Detection Workflow (Brief) | Feb 28 ★ |
| | Demonstrate Capability in Test Environment | Apr 28 |
| | Demonstrate Automation for Workflows | May 28 |
| Space-based RF Detection Technology (Report) | Sep 28 ★ | |
| Project Completion: Sep 28 | | |

Condition-Based Maintenance (CBM) for Coast Guard Asset Product Lines

9204

Mission Need: Targeted CBM for higher asset availability and reduced life cycle costs.

Objectives

- Implement condition-based and predictive maintenance activities within the surface and aviation communities by researching and documenting significant opportunities for using leading indicators and readily available system information, including the following system characteristics: interfaces, data structure, data analysis, and data display that support a data driven system.
- Develop demonstration case studies using predictive maintenance with U.S. Coast Guard (CG) data to provide recommendations for systems and steps required to accommodate desired functional characteristics of a data driven system.



Notes

- Partner with the CG Surface Forces Logistics Center (SFLC) and Aviation Logistics Center (ALC) to make recommendations.
- Partner with U.S. Naval Academy (USNA), U.S. Department of Defense Chief Digital and Artificial Intelligence Office (CDAO), U.S. Navy's Naval Air System Command and Naval Sea Systems Command, and U.S. Army Combat Capabilities Development Command Aviation & Missile Center, U.S. Army's Aviation and Missile Research Development and Engineering Center Engineering Directorate Quality Information Systems Branch.

Sponsor's Rep: CG-45, CG-41
Ops Rep: N/A

Stakeholder(s): SFLC, ALC

RDC Research Lead:
Ms. Christine Hansen

CG-926 Portfolio Manager:
Dr. David Wiesenbahn

Anticipated Outcome/Transition: Recommendations for Cost/Risk Avoidance
Recommendations on Tech Availability & Applicability

| | | |
|--|---|----------------------|
| Project Timeline / Key Milestones | Project Start: 1 Apr 19 | |
| | Initial Surface Asset Review and Benchmarking | 1 Dec 19 ✓ |
| | CBM for CG Asset Product Lines (Brief) | 14 Feb 20 ✓ ★ |
| | Initial Aviation Asset Review and Benchmarking | 1 Oct 20 ✓ |
| | CBM for CG Asset Product Lines: Update Brief (Brief) | 7 Oct 21 ✓ ★ |
| | DoD CDAO Predictive Maintenance Representative | 1 Jan 22 ✓ |
| | CBM for CG Asset Product Lines: Update Brief Two (Brief) | 17 Oct 22 ✓ ★ |
| | DoD H-60 Health and Usage Monitoring System Data Translation Complete | 1 Oct 23 ✓ |
| | CBM for CG Asset Product Lines: Update Brief Three (Brief) | 30 Oct 23 ✓ ★ |
| | DoD ASET H-60 Sensor Data Analytics | Dec 24 |
| | USNA NSC Sensor Data Analysis | Dec 24 |
| | CBM for CG Asset Product Lines Summary Report (Report) | Mar 25 ★ |
| Project Completion: Mar 25 | | |

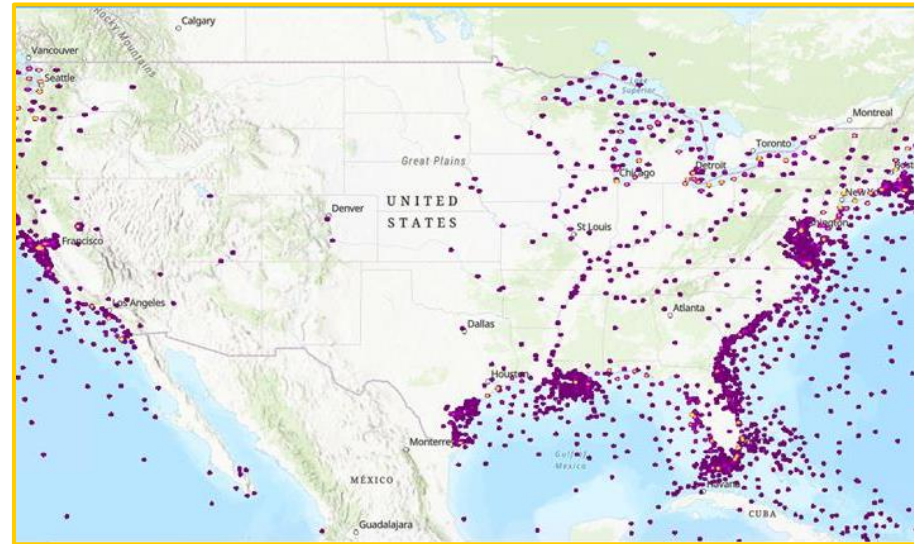
SAR Coverage Model to Evaluate Alternatives to the 2-hour Response Standard

Mission Need: Position response resources efficiently around the CG's Area of Responsibility.

Objectives

Current U.S. Coast Guard (CG) asset siting is based, in part, on a 2-hour Search and Rescue (SAR) response standard, but this standard is based on limited, and potentially outdated, factors.

- Identify and evaluate potential risk and response paradigms for CG SAR.
- If a feasible paradigm is identified, develop a prototype SAR risk and response tool that leverages the new methodology.
- Improve effectiveness of SAR system.
- Optimize basing and siting of SAR resources.



Notes

- Research may benefit from existing tools for siting decision support:
 - CG SAR Visual Analytic (cgSARVA) model (Purdue) is a tool to support surface asset siting.
 - CG SAR Simulation and Value Modeling of Air Station Closures (SAVMASC) is analysis proposing methodology for making risk-based decisions on CG Air Station siting and closures.
- Emergency response organizations employ a host of risk factors in siting determinations. Potential partners include National Urban Security Technology Laboratory, State/local response organizations, and Department of Energy National Laboratories.

| | |
|--|---|
| Sponsor's Rep: CG-SAR Ops Rep: | Stakeholder(s): CG-MLE, CG-MSR, CG-MER, CG-771, CG-731, CG-741, AREAs, CG-PAE |
| RDC Research Lead: Ms. Christine Mahoney | CG-926 Portfolio Manager: Dr. David Wiesenbahn |
| Anticipated Outcome/Transition: | Recommendations for Standards/Regulations/Policy Provide Sponsor/Product Line Tested Prototype |

Project Start: 1 Apr 24

| | | |
|--|---|-----------------|
| Project Timeline / Key Milestones | Literature Review of SAR Response Standard and Emergency Response Siting Methodologies Complete | 30 Aug 24 ✓ |
| | Definition of Constraints for New Siting Methodology Complete | Oct 24 |
| | Develop Analytical Approach to Model SAR Risk and Response Complete | May 25 |
| | SAR Risk and Response Methodology (Brief) | Jun 25 ★ |
| | Prototype Risk and Response Tool Complete | Apr 26 |
| | SAR Risk and Response Tool (Report) | Jun 26 ★ |
| | Project Completion: Jun 26 | |

Mission Need: A time and cost-effective methodology to incorporate sensor capabilities in SAROPS.

- Objectives**
- Establish empirical Lateral Range Curves (LRC) for one selected sensor type through field experiments.
 - Determine if LRCs produced by physics-based models appropriately estimate empirical LRCs for selected sensor type.
 - Define the optimal employment of the selected sensor type for Search and Rescue (SAR) missions.
 - Define LRCs for inclusion in the Search and Rescue Optimal Planning System (SAROPS). The basis of these LRCs will be either physics-based models or the traditional analysis approach, based on the findings of the second objective.
 - Define a process to compute LRCs for sensors enabled with object detection algorithms.
 - Determine if LRCs computed for AI enabled sensors appropriately estimate empirical LRCs.



- Notes**
- Validates LRC modeling approaches identified in RDC Project 7937, "Incorporating Sensor Performance in SAROPS."
 - Leverages RDC's previous work developing SAROPS sensor inputs.

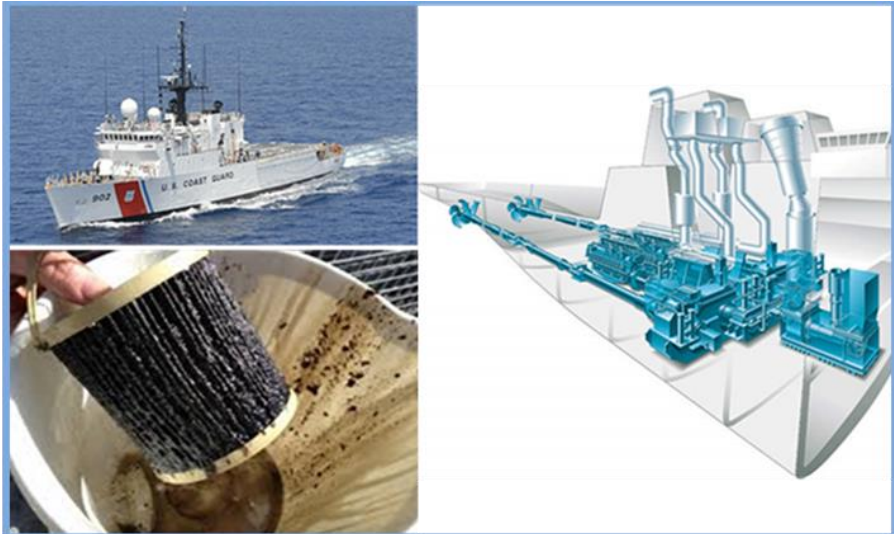
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| Sponsor's Rep: CG-SAR Ops Rep: N/A | Stakeholder(s): CG-931, CG-7, AREAs, Districts, Sectors, FORCECOM |
| RDC Research Lead: Dr. Maggie Exton | CG-926 Portfolio Manager: Dr. David Wiesenbahn |
| Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability Recommendations for Cost/Risk Avoidance | |

Project Start: 4 Apr 24

| | | | |
|--|---|--------|---|
| Project Timeline / Key Milestones | Definition of Combinations of Sensor, Search Asset, and Search Object for Validation Complete | Dec 24 | |
| | Develop Improved Sensor Performance Models for SAR: LRCs Test Plan (Brief) | Feb 25 | ★ |
| | Develop Improved Sensor Performance Models for SAR: Validity of Modeled LRCs (Brief) | Nov 27 | ★ |
| | Define Optimal Use of Sensor for SAR (Brief) | Dec 28 | ★ |
| | Develop Improved Sensor Performance Models for SAR: LRCs for SAROPS (Report) | Jun 29 | ★ |
| | Develop Improved Sensor Performance Models for SAR: Validity of LRCs for AI Enabled Sensors (Brief) | Aug 30 | ★ |
| | Develop Improved Sensor Performance Models for Search and Rescue (Report) | Sep 30 | ★ |
| | Project Completion: Sep 30 | | |

Mission Need: Enhance combustion efficiency to improve engine performance and reduce pollution.

- Objectives**
- Query the U.S. Navy (USN) and other organizations to leverage possible solutions for enhancing combustion efficiency in diesel fuel for energy/propulsion.
 - Identify quantitative parameters for testing the efficacy of using new fuel additives, and combustion enhancement products.
 - Perform field evaluations of available commercial technology with the goal of countering incomplete combustion to improve fuel efficiency, reducing pollution, and reduce maintenance costs.
 - Assess cost and benefits for technology based on test results.
 - Report results on product performance and provide recommendations.
 - Evaluate technologies on engines representative of U.S. Coast Guard (CG) assets.



- Notes**
- Partner with Naval Surface Warfare Center Philadelphia Division on ongoing combustion efficiency research.
 - Leverage CG Academy (CGA) research on biocide additives.
 - Technologies could also be applicable to gasoline and aviation fuel.
 - This project ties into Project Evergreen climate change event.

| | |
|--|--|
| Sponsor's Rep: CG-46 Ops Rep: N/A | Stakeholder(s): CG-45, Surface Forces Logistics Center, CGA, CG-47D |
| RDC Research Lead: Mr. Derek Meier | CG-926 Portfolio Manager: LCDR Stephen Thomsen |
| Anticipated Outcome/Transition: Provide Sponsor/Product Line Tested Prototype Recommendations for Product Line Tech Insertion | |

Project Start: 1 Oct 21

| | | |
|--|--|--------------|
| Project Timeline / Key Milestones | Engine Combustion Enhancement Technology: Down Selection (Brief) | 9 Feb 23 ✓ ★ |
| | Biocide Laboratory Testing Complete | 29 Sep 23 ✓ |
| | Engine Prototype Testing Complete | 10 May 24 ✓ |
| | Fuel Additive Analysis for Ultra Low Sulfur Marine Gas Oil, JP-5, and F-76 (Application Note) | Nov 24 ★ |
| | Engine Combustion Enhancement Technology (Report) | Dec 24 ★ |
| | Project Completion: Dec 24 | |

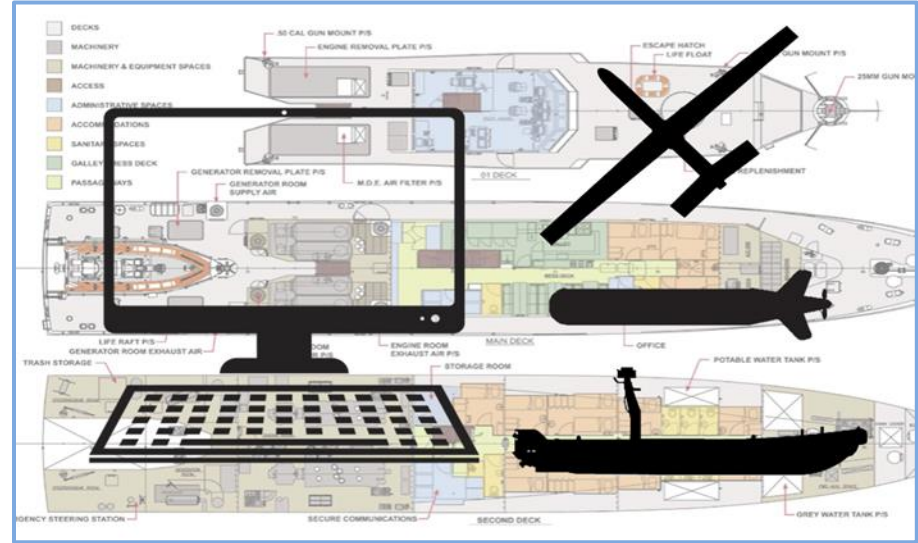
Mission Need: Integrated UxS across cutter fleet to augment operational capabilities.

Objectives

- Determine the capacity for FRC/WLM/WLB cutter classes to integrate, deploy, and support UxS.
- Identify applicable UxS classes, based on space, weight, power, capability, and personnel requirements for specified afloat platforms.
- Strategize and assess possible cutter/UxS combinations and integration considerations through facilitated stakeholder workshops.
- Identify design efficiencies related to human, mission, system and infrastructure integration.
- Deliver decision support information regarding UxS integration by performing and documenting results of Operational Demonstration (OP DEMO).
- Inform future capability and operational documents.
- Help inform the operationalization of the U.S. Coast Guard (CG) UxS Strategic Plan while leveraging the results of the Autonomy Evergreen event.

Notes

- UxS integration considers maritime air, surface, and subsurface systems of all scales that can be based onboard a cutter.
- Leverages RDC Project 7820, "Maritime Uncrewed System Technology," to highlight capabilities.
- Addresses imperatives highlighted by National Academies of Science UxS study.
- Leverage research by the Naval Postgraduate School, Navy Surface Warfare Centers, Naval War College, and Naval Research Laboratory.



Sponsor's Rep: CG-751
Ops Rep: D7 (dre)

Stakeholder(s): CG-7 UxS, CG-731, CG-711, CG-721, CG-771, CG-4, CG-2, CG-93, DCMS DPR-23

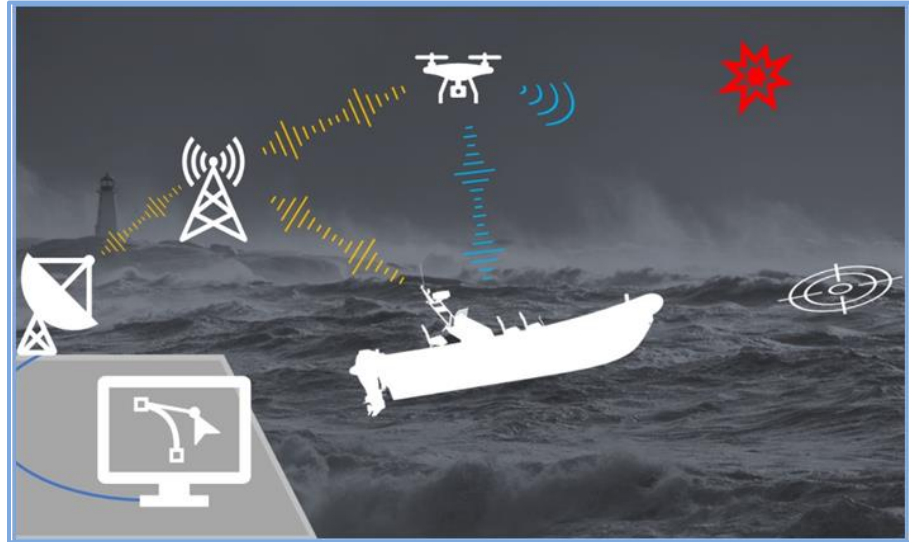
RDC Research Lead: LTJG Jorge Wismar
CG-926 Portfolio Manager: LCDR Stephen Thomsen

Anticipated Outcome/Transition: Recommendations for Product Line Tech Insertion
 Recommendations on Tech Availability & Applicability

| | | |
|--|--|-----------------|
| Project Timeline / Key Milestones | Project Start: 3 Oct 22 | |
| | Cutter Capacities and UxS Characterization Crosswalk | 28 Sep 23 ✓ |
| | Cutter / UxS Teaming Concept of Operations Exercises | 23 Apr 24 ✓ |
| | D7 OP DEMO | 27 Sep 24 ✓ |
| | Cutter-based UxS Integration (Brief) | Dec 24 ★ |
| | Mission Integration Workshop | Dec 24 |
| | Cutter-based UxS Integration (Report) | Apr 25 ★ |
| | Project Completion: Apr 25 | |

Mission Need: Improved response outcomes through UxS integration into CG SAR operations.

- Objectives**
- Identify critical gaps in current U.S. Coast Guard (CG) Search and Rescue (SAR) operations where integration of UxS technologies could significantly enhance operational effectiveness.
 - Characterize current capabilities within the UxS market, focusing on technological maturity and potential adaptability to SAR operations.
 - Investigate how other SAR organizations, both domestic and international, currently utilize UxS.
 - Conduct targeted trials to evaluate the feasibility and integration potential of selected UxS technologies within simulated SAR scenarios.
 - Deliver SAR-specific UxS integration recommendations to facilitate the implementation and operationalization of the CG UxS Strategic Plan.



- Notes**
- Leverages RDC Project 1028 “Cutter-Based Uncrewed Systems (UxS) Integration Analysis.”
 - Benchmark U.S. Department of Defense, Other Government Agencies, and allied nations’ UxS programs.
 - Addresses imperatives highlighted by Unmanned Systems Strategic Plan to integrate UxS in CG operations.

Sponsor’s Rep: CG-SAR
Ops Rep: LANT-3

Stakeholder(s): CG-7 UxS, CG-711, CG-731, CG-741, CG-751, CG-5RI, DCMS-DPR-23

RDC Research Lead:
 Ms. Marie Whalen

CG-926 Portfolio Manager:
 LCDR Stephen Thomsen

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability

Project Start: 3 Jun 24

| | |
|--|-----------------|
| UxS SAR Capabilities Baseline | Oct 24 |
| UxS Test Assets Acquired | Feb 25 |
| UxS for SAR Technology Deployment Plan (Brief) | May 25 ★ |
| UxS for SAR Technology Deployment Complete | Sep 25 |
| Uncrewed Systems Integration in Coast Guard Search and Rescue Operations (Report) | Jan 26 ★ |

Project Completion: Jan 26

Remote Diagnostic and Monitoring Systems for Technical Support Engineering

Mission Need: Improve shore-side access to cutter engineering data.

Objectives

- Assess Supervisory Control and Data Acquisition (SCADA) implementation across U.S. Coast Guard (CG) cutter classes.
- Investigate Military/Other Government Agency (OGA)/Commercial vessel SCADA data transfer technology maturity and implementation framework.
- Creation of SCADA Working Group to develop use cases and roadmap SCADA solutions.
- Develop a demonstration plan for a data transfer system on a selected CG asset.
- Perform demonstration of selected SCADA technologies.
- Deliver decision support information and technology transition report and use case roadmaps.



Notes

- Leverage Naval Sea Systems Command and Military Sealift Command for technology framework application.
- Partner with Surface Forces Logistics Center (SFLC) and RDC Project 9204, "Condition Based Maintenance for Coast Guard Asset Product Lines," Project Manager for solution integration with CG systems (e.g., CG-LIMS, ALMIS, etc.).
- Collaboration with Naval Surface Warfare Center Philadelphia for SCADA prototype and demonstration.
- Potential collaboration with the Naval Postgraduate School and Johns Hopkins Applied Physics Laboratory.

Sponsor's Rep: SFLC
Ops Rep: N/A

Stakeholder(s): CG-761, CG-751, CG-45, CGCYBER, CG-ODA

RDC Research Lead:
Mr. Matthew Lees

CG-926 Portfolio Manager:
LCDR Stephen Thomsen

Anticipated Outcome/Transition: Recommendations for Product Line Tech Insertion
Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

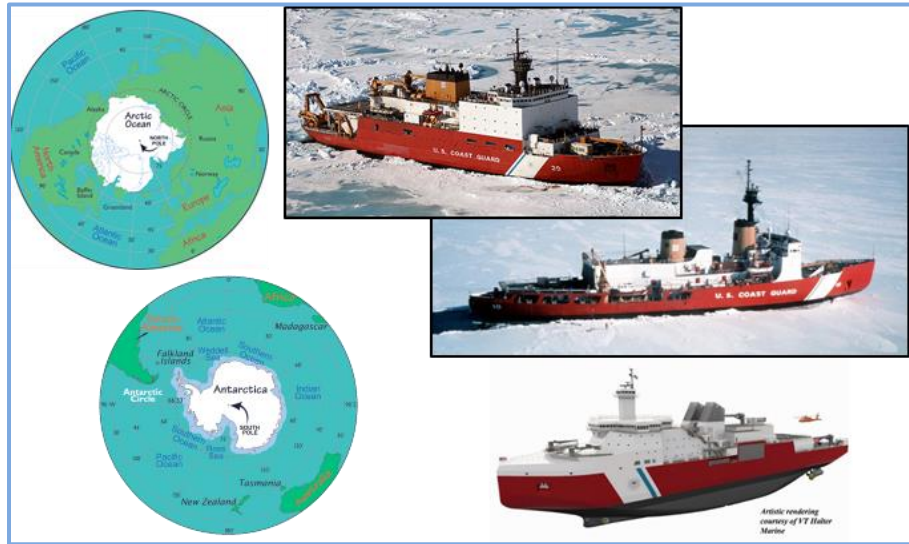
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| Project Start: 3 Oct 22 | |
| Cutter Surveys and SCADA Assessment | 31 May 23 ✓ |
| Military/OGA/Commercial SCADA Data Transfer Technology Benchmarking | 30 Jun 23 ✓ |
| Supervisory Control and Data Acquisition Data Transfer Technology Investigation (Brief) | 6 Sep 23 ✓ ★ |
| SCADA Prototype Demonstration | Jun 25 |
| SCADA Demonstration Evaluation Complete | Sep 25 |
| Remote Diagnostics and Monitoring Systems for Technical Support Engineering (Report) | Feb 26 ★ |
| Project Completion: Feb 26 | |



Mission Need: Innovative capability solutions for enhanced operations in the Polar Regions.

Objectives

- Provide support to projects which develop capability improvements in the execution of U.S. Coast Guard (CG) missions in Polar Regions.
- Cultivate joint efforts and interagency cooperation between government sectors and civilian entities.
- Evaluate emerging technologies to enhance CG operations in Polar Regions including UxS.
- Develop improved ice and near-ice navigation tools and procedures for surface vessels conducting operations in the Polar Regions.



Notes

- Anticipate partnerships with the U.S. Department of Defense Labs, U.S. Northern Command, National Labs, Office of Naval Research Science, International Cooperative Engagement Program for Polar Research, and the National Science Foundation U.S. Antarctic Program (McMurdo Station).

| | |
|--|---|
| Sponsor's Rep: CG-5PW Ops Rep: PAC-3, LANT-5, D17 | Stakeholder(s): CG-751, CG-761 |
| RDC Research Lead: Ms. Shalane Regan | CG-926 Portfolio Manager: Ms. Karin Messenger |

Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability

Project Start: 3 Oct 22

| | | |
|--|---|----------------------|
| Project Timeline / Key Milestones | Polar Regions Technology Evaluation (PRTE) – FY23 Planning Summary (Brief) | 31 Jan 23 ✓ ★ |
| | HEALY 2023 Tests/Demos Complete | 12 Oct 23 ✓ |
| | Scientific Roundtable – Tromsø, Norway (Quick-look Report) | 18 Dec 23 ✓ ★ |
| | PRTE – FY24 Planning Summary (Brief) | 13 May 24 ✓ ★ |
| | FY23 PRTE (Application Note) | Nov 24 ★ |
| | HEALY 2024 Tests/Demos Complete | Nov 24 |
| | PRTE – FY25 Planning Summary (Brief) | Jan 25 ★ |
| | NextGen Ice Nav RFI Decision | Jan 25 |
| | ODF 25 Tests/Demos Complete | Apr 25 |
| | Polar Regions Technology Evaluation Exercise | Sep 25 |
| | HEALY 2025 Tests/Demos Complete | Nov 25 |
| | FY25 PRTE (Application Note) | Jun 26 ★ |

Project Completion: Jun 26

Counter Uncrewed Underwater Vehicle (C-UUV) Defeat Capabilities & Technologies

Mission Need: Modular response asset capabilities to deter and defeat adversarial UUVs.

Objectives

- Deliver decision support information regarding improved C-UUV capabilities for deterring and defeating UUVs.
- Refine U.S. Coast Guard Concepts of Operation (CONOPs) for response to adversarial UUVs.
- Establish procedures for control/custody of defeated UUVs with domestic security partners.



Notes

- Leverages results from RDC Project 5922, "Counter Uncrewed Underwater Vehicle (C-UUV) Technology."
- Coordinated with C-UUV Community of Interest (COI) prior and ongoing work.
- Research informed by the interagency C-UUV National Action Plan.
- Aligned with goals of CG Unmanned Systems Strategic Plan.
- Possible partnership opportunities with Office of Naval Research (ONR) Global, North American Treaty Organization (NATO) allies, U.S. Navy Fleet Forces Command, and U.S. Navy's numbered fleet Science Advisors.

Project Timeline / Key Milestones

Project Start:

Please e-mail RDC-Info@uscg.mil for information concerning the milestones and deliverable schedule.

Project Completion:

Sponsor's Rep: CG-721
Ops Rep: N/A

Stakeholder(s): CG-45, CG-731, CG-5R, CG-ODO, CG-761

RDC Research Lead:
C-UUV Research Team

CG-926 Portfolio Manager:
C-UUV Research Team

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability



Directed Energy Technologies Against Non-Compliant Vessels and Uncrewed Systems

Mission Need: Non-lethal capabilities to deter and defeat crewed and uncrewed systems.

- Objectives**
- Analyze the application of Directed Energy (DE) technology to Non-Compliant Vessel (NCV) stopping and Counter-Uncrewed System (C-UxS) operations.
 - Assess the technical readiness of existing and emerging DE technologies.
 - Characterize the threats and targets for which DE represents an improved non-lethal solution.
 - Integrate DE deployment into the Use of Force continuum.
 - Identify the Size, Weight and Power constraints of CG response assets.
 - Leverage the Department of Defense, Department of Homeland Security Science and Technology Directorate, and Other Government Agency (OGA) investments in DE.
 - Participate in technology demonstrations sponsored by OGA's.
 - Map DE technology maturity for non-lethal maritime use.
 - Develop plans for integration and testing of DE prototypes on afloat platforms.
 - Identify U.S Coast Guard policy gaps and influence the development of future authorization(s).



- Notes**
- Leverages results from RDC Project 5678, "Non-Compliant Vessel Stopping Using Less-Than-Lethal Radio Frequency Technologies," Project 7815, "Advanced Maritime Counter-Uncrewed Aircraft System (C-UAS) Technologies," and Project 7812, "Counter Unmanned Aerial System (cUAS)."
 - Focus on both air and surface targets.
 - Joint DHS S&T/RDC project.

Sponsor's Rep: CG-721
Ops Rep: D7, D11

Stakeholder(s): CG-MLE, CG-MSR, CG-932, SFLC, CG-68, CG-761, LANTAREA, PACAREA

RDC Research Lead: DE Research Team
CG-926 Portfolio Manager: DE Research Team

Anticipated Outcome/Transition: Recommendations on Tech Availability & Applicability
 Recommendations for Tactics, Techniques & Procedures

Project Start:

Project Timeline / Key Milestones

Please e-mail RDC-Info@uscg.mil for information concerning the milestones and deliverable schedule.

Project Completion:

Optionally-crewed Surface Vessels for Coast Guard Missions

1050

Mission Need: Increase cutter capability through remote and autonomous controlled surface vessels.

Objectives

- Determine operational perception sensor requirements for USCG uncrewed vessels.
- Determine communication requirements between cutter and cutter boat to include redundant communications and fail-safe's.
- Determine integration requirements for uncrewed surface vessel (USV) on both cutter and cutter boat.
- Determine safety requirements for USV operation.
- Determine launch and recovery requirements for USV operation.
- Determine concept of operations for use of uncrewed cutter boat.
- Determine crew impact on operating an uncrewed vessel.
- Collect crew feedback on use of uncrewed cutter boat.
- Evaluate human-machine teaming requirements for operation.
- Provide project sponsors and stakeholders a road map on how to incorporate the technology on other cutters.



Notes

- Leverage research completed by the Naval Surface Warfare Centers, Naval Research Laboratory, and Naval Postgraduate School.
- Potential partners include the Office of Naval Research, Naval Research Laboratory, Naval Postgraduate School, and Naval Surface Warfare Center's Corona, Crane, and Carderock divisions.

Sponsor's Rep: CG-7 UxS
Ops Rep: N/A

Stakeholder(s): CG-45, CG-721, CG-731, CG-751, CG-761, CG-791, SFLC, DCMS DPR-23, AREAs

RDC Research Lead:
Mr. Derek Meier

CG-926 Portfolio Manager:
LCDR Stephen Thomsen

Anticipated Outcome/Transition: Provide Sponsor/Product Line Tested Prototype Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: May 25

Identify Candidate Cutter/Boat Test Bed for Limited User Evaluation Dec 25

Optionally-crewed Surface Vessels for CG Missions: Summary of Prototype Deployment Plan (Brief) **Mar 26** ★

Prototype Contract Award Jul 26

Initiate Limited User Evaluation Jan 27

Optionally-crewed Surface Vessels for CG Missions: Limited User Evaluation Quick Look (Report) **Nov 27** ★

Optionally-crewed Surface Vessels for Coast Guard Missions (Report) **Mar 28** ★

Project Completion: Mar 28



Acquisition Directorate
Research & Development Center



CG Research & Development Center
UNCLAS//Internet Release is Authorized

Indicates RDC Product ★

October 2024 41

Rapid Reaction Technology (RRT) Tasks

Purpose: Evaluate high Technology Readiness Level Commercial Off-the-Shelf and Government Off-the-Shelf technologies through field tests and limited user evaluations.

| RRT Funding Type: R&D & OSLTF | | RDC Research Lead: Mr. Scott Fields | CG-926 Portfolio Manager: Various | |
|------------------------------------|--|-------------------------------------|-----------------------------------|---|
| RRT Note Title | Objective | Office Supported | Due/ Delivery Date | |
| 29ft Response Boat Recovery Ladder | Evaluate prototype 29' RBS II rescue ladder. Conduct Limited User Evaluation. | CG-731 | 24 Jan 2024 | ✓ |
| Electric P-6 Pump | Conduct market research and evaluate potential replacement gasoline operated P-6 Pump with other non-gas operated pumps. | CG-731 | 2 Jul 2024 | ✓ |
| Milo Action Communicator | Conduct field test and obtain feedback on Milo Walkie Talkies. | CG-761 | 31 Jul 2024 | ✓ |

Open Tasks Migrated to New Program Plans for FY25 Execution:

| | | | |
|---|--|-------------------|----------|
| XplorIR | Test capabilities of direct-read FTIR gas and vapor detector and obtain feedback from Strike Teams. | CG-7214/NSF | Jan 2025 |
| Garmin Montana 700i Multi-Function GPS Device | Provide 2-way satellite messaging and SOS capabilities to RBMs operating outside of VHF range. | Sector Charleston | Jan 2025 |
| GLOROPE | Conduct fields tests and obtain feedback from operation units on glow-in-the-dark rope, buoys, life rings, and post bumpers. | CG-731 | Jan 2025 |
| Element E100 Fire Extinguisher Stick | Evaluate new fire extinguishing technology for A, B, C and K fire classes. | CG-4 | Jan 2025 |
| Sharrow Propeller Performance Testing | Conduct field test and evaluate Sharrow Propellor on 29ft RBS to determine power and efficiency. | CG-731/SBPL | May 2025 |
| Darley e-P6 Pump Evaluation | Building upon CGA capstone from 2024, conduct test and evaluation of electric P-6 Pump prototype from Darley. | CG-731 | Jul 2025 |
| GoTenna | Evaluate mesh UHF network communications. | C5ISC | Jul 2025 |

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil.



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Operational Test Agent (OTA) for the sUAS for NSC Program Re-compete

OTA

Mission Need: Independent and objective evaluation of sUAS operational suitability/effectiveness.

Objectives

- Generate test plan for Small Unmanned Aerial Systems (sUAS) for the National Security Cutter (NSC).
- Perform Operational Testing & Evaluation (OT&E) of sUAS.
- Provide OT&E report to the sponsor program office.



Notes

- Work with Sponsor and CG-926 to develop test plan for sUAS.

Project Timeline / Key Milestones

| | |
|---|-----------------|
| Project Start: 5 Feb 24 | |
| Develop Test Plan | Oct 24 |
| Conduct OT&E | Mar 25 |
| Summary Report of OT&E | May 25 |
| NSC Program sUAS OT&E Report | Aug 25 ★ |
| Project Completion: Aug 25 | |

Sponsor's Rep: CG-9313
Ops Rep: N/A

Stakeholder(s): CG-711, CG-926

RDC Research Lead:
Ms. Shelly Wyman, P.E.

CG-926 Portfolio Manager:
Mr. Scott Craig

Anticipated Outcome/ Transition: Recommendations for Acquisition Milestone Support



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RDC Evergreen Pinecone in Collaboration with DCO-X

Mission Need: Understand strategic research and development science-based issues.

Objectives

- Evergreen was meant not only to develop long-range plans or strategies, but also to instill strategic intent throughout the U.S. Coast Guard (CG). Strategic intent is a shared organizational understanding of where the Service as a whole is going and why.
- Each Evergreen Pinecone frames future CG strategies, operational approaches, and research areas to address impact concerns specific to the topic over the next 10-50 years. The event output will help the Service formulate adaptation, mitigation, resilience strategies and focus research and development initiatives for the coming decades.
- RDC supports Pinecone events as Science Advisors to the Service.
- This joint RDC/DCO-X collaboration provides another opportunity for strategic foresight which will serve the organization for years to come.

Notes

- DCO-X & RDC will collaborate and conduct at least one strategic foresight exercise each year. Each event will involve:
 - Identifying a mutual area of strategic research or emerging technology.
 - Convene leadings Subject Matter Experts to discuss focused questions.
 - Produce a Quick Look and Final Report for Senior service decision makers.



Project Timeline / Key Milestones

| | |
|---|----------------------|
| Project Start: Ongoing | |
| Space Evergreen Pinecone | 23 Sep 21 ✓ |
| Space Evergreen (Report) | 28 Oct 21 ✓ ★ |
| Climate Evergreen Pinecone | 31 Aug 22 ✓ |
| Climate Evergreen (Report) | 20 Dec 22 ✓ ★ |
| Autonomous Systems Evergreen Pinecone | 14 Sep 23 ✓ |
| Autonomous Systems Evergreen Quick Look | 1 Oct 23 ✓ |
| Autonomous Systems Evergreen (Report) | 6 Dec 23 ✓ ★ |
| Deterrence Evergreen Pinecone | 28 Aug 24 ✓ |
| Deterrence Evergreen Quick Look | 25 Sep 24 ✓ |
| U.S. Coast Guard Deterrence Evergreen (Report) | Nov 24 ★ |
| Sustainment/Contested Logistics Evergreen Pinecone | Aug 25 |
| Sustainment/Contested Logistics Evergreen (Quick Look) | Oct 25 ★ |
| Sustainment/Contested Logistics Evergreen (Report) | Jan 26 ★ |
| Project Completion: Ongoing | |

Sponsor's Rep: DCO-X
Ops Rep: LANT-2

Stakeholder(s): LANTAREA/PACAREA

RDC Research Lead:
 Dr. Joe DiRenzo

CG-926 Portfolio Manager:
 N/A

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability
 Recommendations for Tactics, Techniques & Procedures

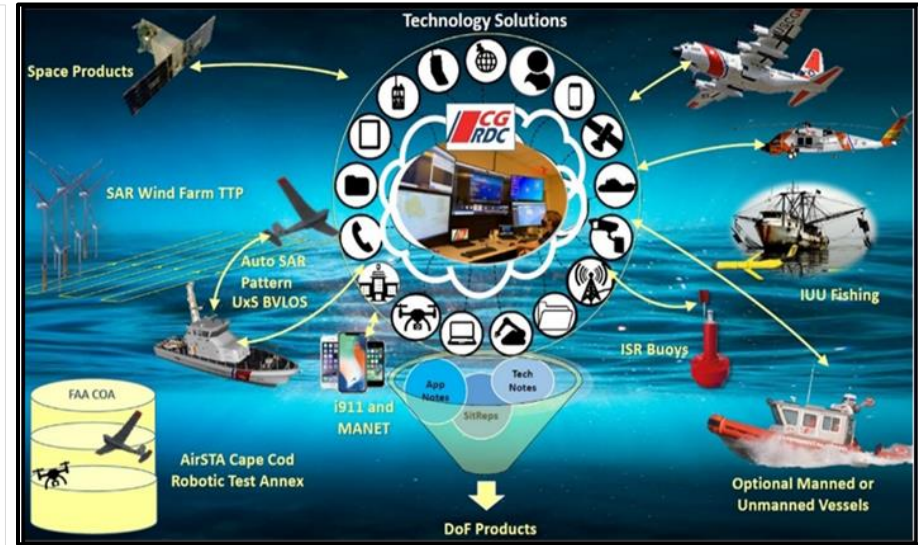
Mission Need: Rapid tech evaluation to inform operational, requirement, and acquisition decisions.

Objectives

- Provide an R&D testbed for exploration/integration of advanced solutions, to help the U.S. Coast Guard (CG) understand, prepare, acquire, operationalize tomorrow's technologies to achieve more rapid and agile tech transition.
- Serve as an operational test environment for Technology Readiness Level (TRL) 7-8 technology.
- Inform operational use cases, Tactics, Techniques and Procedure (TTP), requirements, acquisitions, asset siting, and workforce optimization.
- Provide a recognized research forum that adheres to enterprise authorities required to integrate/evaluate new IT systems, cybersecurity, privacy, environmental, and human subject research.
- Provide opportunities to advance emergent technology in CG Concept f Operations (CONOPS) and TTPs through cooperative research and partnerships.

Notes

- Build on past and future technology and Maritime Domain Awareness (MDA) sprints, e.g., D14 Low-Cost MDA project (2020), D8 MBL Autonomy (2023), and D7 BVLOS (2023).
- Aligns with 2022 VCG Search and Rescue and Coastal Strategic Study.
- Agreement with CG-741 focuses initial efforts on Sectors Boston and Long Island Sound. Proximity to RDC researchers, new comms lab, and use of Fisher's Island STA reduce initial logistics costs.
- Efforts will primarily focus on higher TRL efforts within the RDC's research portfolio but will allow for efforts of particular importance to the Sectors.
- Transition to a continual, standing effort initially targeted to two locations. RDC may also conduct in-situ sprints at other locations where appropriate.



Sponsor's Rep: CG-741

Ops Rep: D1

RDC Research Lead:

LCDR Paul Larouche

Stakeholder(s): CG-PAE, CG-2/ 5R/5P/6/711/721/ 731/751/761/771, AREAs, Districts, C5ISC

CG-926 Portfolio Manager:

N/A

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability
Recommendations for Tactics, Techniques & Procedures

Project Start: Ongoing

Project Timeline / Key Milestones

| | |
|--|-------------|
| Initial/Introduction Meeting with Sector Boston and Sector LIS | 5 Jun 23 ✓ |
| Unit Visits | 31 Aug 23 ✓ |
| SAR Pattern Transmit Over AIS (Sector LIS) | 12 Mar 24 ✓ |
| Sector Technology Roll-out(s) | 30 Sep 24 ✓ |
| Aqua Alert (D1, D11) | Feb 25 |
| RDC Technology Demonstration(s)/Project Updates Invitations to SoF-related Demos/Tech Sprints | As Needed |

Project Completion: Ongoing

