Acquisition Directorate
Research, Development, Test & Evaluation

U.S. Coast Guard
FY24 RDT&E
Project Portfolio

RDC Command Video: https://www.dvidshub.net/video/867068/coast-guard-rdc-overview

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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 CG operations in arctic regions.
- Analyze possible UAS and identify integration considerations tailored for Coast Guard 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.
- Determine UAS operations capabilities in high sea states, high winds, icing, low visibility, and low temperatures.
- Construct notional future scenarios that represent the integration of future design requirements.
- Inform future capabilities and operational documents.

Notes

- Plan to analyze data from the Office of Naval Research 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). Most project 1040 objectives were addressed by ICE PPR and ONR Global in 2023 and 2024 through field experiments.

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

Stakeholder(s): CG-7 UxS, 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 Timeline / Key Milestones

Project Start: 1 Apr 24

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

Project Completion: Dec 24

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 from a CGC.
- Inform due regard parameters for CG BVLOS UAS operations.
- Establish a BVLOS Certificate of Authorization for Coast Guard operations.
- Conduct a land-based Medium Range-UAS Search and Rescue (SAR) demonstration, followed by a Limited User Evaluation (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 U.S. Southern Command (SOUTHCOM), Federal Aviation Administration, National Oceanic and Atmospheric Administration, Office of Naval Research (ONR), Joint Interagency Task Force South (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 Timeline / Key Milestones

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 SAR Demonstration Complete	Oct 24		
Land and Vessel-Based BVLOS Demonstrations (Brief)	**Oct 24**		★
Beyond Visual Line of Sight UAS Operations (Report)	**Jan 25**		★

Project Completion: Jan 25

Maritime Uncrewed System Technology (MUST)

7820

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 Timeline / Key Milestones

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)	**Sep 24** ★
Maritime Uncrewed System Technology (Report)	**May 25** ★

Project Completion: May 25

Aviation Branch Support

9992A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future aviation and test and evaluation technology/systems including: Crewed and Uncrewed Aircraft Systems (UAS), mission analysis, wide area surveillance, search and rescue, and persistent/strategic Maritime Domain Awareness.
- Maintain Branch infrastructure to support CG RDC portfolio objectives.
- Support Aviation Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding aviation technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority serving Institution students internship opportunities.

Notes

- Nexus for research and development uncrewed efforts.
- Participating in Medium Range UAS IPT and Small UAS Work Group.
- Sponsor for Naval Postgraduate School (NPS) Graduate Thesis Research on UAS integration.
- Partnered with U.S. Southern Command research efforts.
- Partnered with U.S. Customs and Border Protection, Federal Aviation Administration, U.S. Naval Research Laboratory, National Oceanic and Atmospheric Administration, and National Aeronautics and Space Administration Beyond Visual Line of Sight technology efforts.

Sponsor's Rep: CG-926 **Ops Rep:** N/A	**Stakeholder(s):** CG-41, CG-711, CG-721, CG-931, CG-SAR, ALC, DHS S&T
RDC Research Lead: Mr. Sean Lester	**CG-926 Portfolio Manager:** LCDR Stephen Thomsen
Anticipated Outcome/ Transition: Various	

Project Timeline / Key Milestones

Project Start: Ongoing

Sponsor NPS Thesis: NPS-23-008: Operationalizing UAS Aboard U.S. Navy and CG Ships	29 Dec 23 ✓
Sector of the Future Support – Field Automatic Identification System Transmit for Search and Rescue in Sector Boston and Sector Long Island Sound	Sep 24
Integrate UAS Tasking of Surface Vessels Through Navigation Systems (STEDS)	Sep 24
Integrate RDC Assets into Team Awareness Kit Environment	Sep 24
Maintain UAS Operator Proficiency	Sep 24
Implement Common Operating Picture Integration of Sensor Data for Uncrewed System Platforms	Jun 25
Joint Capability Technology Demonstration Wide-Area Autonomous Maritime Target Detect and Classification Technology Demonstration Support	Jul 25

Project Completion: Ongoing

Handheld Device Applications to Support Post-Storm Damage Assessments

1007

Mission Need: Accurate and timely field imagery and data from response teams.

Objectives

- Identify an efficient electronic means for field teams to quickly and accurately communicate data such as vessel damage assessments, Shoreline Cleanup Assessment and Technique forms, facility assessment forms for the Marine Transportation System Recovery Unit, Aids To Navigation verification, and other needed data.
- This effort will:
  - Assess existing mobile applications such as DAART, MAGE, TAK, ArcGIS, and Microsoft 365 mobile functionality.
  - Create a Damage Assessment tool for mobile field teams to use and evaluate after a major storm.
  - Determine the feasibility of connecting data and developing custom views in a Common Operating Picture (COP) such as Coast Guard One View, FirstNet dispatch console, and the Naval Research Laboratory's PROTEUS global Maritime Domain Awareness system.

Completed

Notes

- Explore the U.S. Army Space and Missile Defense Command's Domestic Operations Awareness and Assessment Response Tool (DAART), the National Geospatial-Intelligence Agency's (NGA) Mobile Awareness GEOINT Environment (MAGE), and the Team Awareness Kit (TAK) as potential Government Off-The-Shelf (GOTS) solutions.
- Consider partnerships with the National Oceanic and Atmospheric Administration (NOAA), Federal Emergency Management Agency (FEMA), and Natick Soldier Systems Center TAK lab.

Sponsor's Rep: CG-OEM
Ops Rep: MSU Lake Charles

Stakeholder(s): CG-761/741/5R/67/68, CG-FAC, CG-MER, CG-NAV, C5ISC, CGCYBER

RDC Research Lead:
Mr. Rob Coburn

CG-926 Portfolio Manager:
Mr. Joshua Henson

Anticipated Outcome/ Transition: Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Complete Market Research	22 Jul 22 ✓
Complete Assessment of GOTS Mobile Solutions	30 Dec 22 ✓
Assessment of Handheld Device Applications to Support Post-Storm Damage Assessments (Brief)	**28 Feb 23 ✓ ★**
Complete Common Operating Picture Exploration	22 Sep 23 ✓
Complete Field Map Development and Testing	30 Nov 23 ✓
Handheld Device Applications to Support Post-Storm Damage Assessments (Report)	**26 Feb 24 ✓ ★**

Project Completion: 26 Feb 24

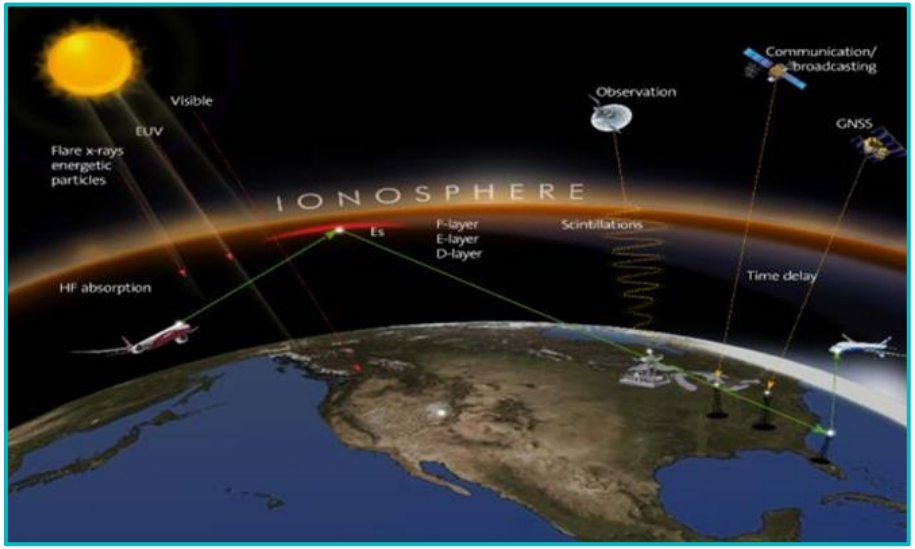
Mission-Specific Long-Range Communication Analysis

8504

Mission Need: Long-range communication options ranked for each mission set and environment.

Objectives

- Determine an optimized list of long-range communications (LRC) options for each U.S. Coast Guard (CG) mission in each area of operation, met with available or near-term available equipment. This will be accomplished by:
  - Developing a Beyond Line of Sight (BLOS) Cutter Survey and conducting focus group and site surveys in all districts for Fast Response Cutters (FRC) and larger assets.
  - Identifying baseline, new, and emerging long-range communications options to include technologies such as:
    - Low, medium, and High Frequency (HF).
    - Satellite communications (SATCOMMS).
    - 3G/4G/5G Automatic Link Establishment (ALE).
  - Developing a comprehensive matrix assessing the results of surveys and site visits by mission and geographic area.



Notes

- Leverage CG-761-developed Capabilities Based Assessment on current state of U.S. Coast Guard long-range communications.
- Share findings with Southern Command (SOUTHCOM) and Joint Interagency Task Force-South (JIATF-S) facilities and long-range communications capabilities and other potential U.S. Department of Defense research laboratories solutions as needed.
- Share findings with Naval Postgraduate School to identify long range communications collaboration opportunities.

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Long Range Communications Requirements Analysis	1 Jun 21 ✓
Cutter BLOS COMMS Survey Requirements	31 Jan 22 ✓
Mission-Specific Long-Range Communications Analysis (Brief)	**15 Mar 22 ✓ ★**
Cutter COMMS Focus Groups Survey	23 Oct 22 ✓
Cutter COMMS Site Visits	31 May 23 ✓
Long-Range Communications Matrix	23 Aug 23 ✓
Coordination with FORCECOM, SFLC, and COMMCOM	31 Oct 23 ✓
Mission-Specific Long-Range Communications Analysis (Report)	**Jul 24 ★**
Project Completion: Jul 24	

Sponsor's Rep: CG-761
Ops Rep: LANT-3, PAC-3

Stakeholder(s): CG-68/751/791, C5ISC, CGCYBER, JIATF-S, SOUTH/FORCE/COMMCOM, LANT, PAC

RDC Research Lead:
Mr. Mark Wiggins

CG-926 Portfolio Manager:
Mr. Joshua Henson

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

Platform Cybersecurity Solutions for CG Cutters

1034

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 Machinery Control System (MCS) or another 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 CGMCS.
- Inform requirements for new acquisition systems to build cyber resiliency into 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) for a proof-of-concept demonstration on Machinery Control and Monitoring System (MCMS).
- NSC CGMCS demonstration integrates with 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. Joshua Henson
Anticipated Outcome/ Transition:	Recommendations for Product Line Tech Insertion Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: 7 Dec 22	
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	Sep 24
OT Network Situational Awareness (Report)	**Mar 25** ★
NSC CGMCS SABER Validation	Sep 25
CG SABER Capability Expansion (Brief)	**Mar 26** ★
CGMCS Boundary Enforcement and Response Exercise	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	

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 mature.
- 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:

Alternate Navigation Positioning Sources

1035

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 restricted water transits.
- 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 Naval Surface Warfare Center - Dahlgren ongoing work, U.S. Marine Corps SkyView effort, and related work completed by the U.S. Navy Four-Star Fleet.
- Coordinate with CG-NAV and CG Navigation Center (NAVCEN) Positioning, Navigation, and Timing Working Group on alternative solutions.
- Effort aligns with Cyber Strategic Outlook 2021 Line of Effort 2: Protect the Marine Transportation System.

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: Mr. Benjamin Berman	**CG-926 Portfolio Manager:** Ms. Holly Wendelin
Anticipated Outcome/ Transition:	Provide Sponsor/Product Line Tested Prototype Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: 1 Apr 23

Perform Initial APNT Market Research	Aug 24	
Existing Alternatives for Navigation Positioning (Brief)	**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

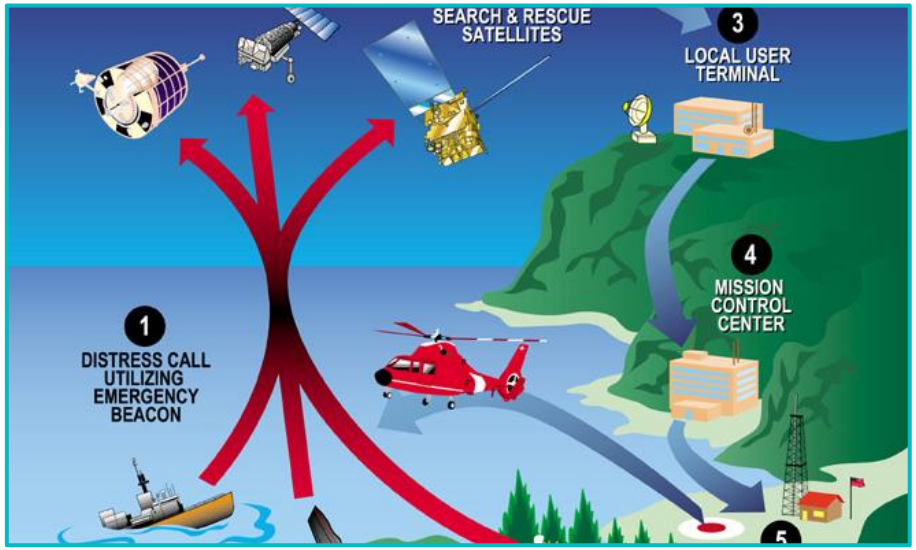
Single Point Electronic Distress Notification

1041

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

Objectives

- Standardize communication pathway for all electronic distress notifications.
- Create table of emergency distress 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 data to the CG or other Search and Rescue (SAR) service providers, including the National Oceanic and Atmospheric Administration (NOAA) Search and Rescue Satellite-Aided Tracking Program (SARSAT).
- Work with industry partners to create a prototype uniform distress signal to be received by CG-SAR.
- 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 the NOAA 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.
- Potential collaboration 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. Joshua Henson
Anticipated Outcome/ Transition:	Recommendations for Standards/Regulations/Policy Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: 1 Apr 24	
Kickoff Meeting with CG-SAR and Stakeholders	Aug 24
Conduct Market Research of Emergency Distress Devices	Jun 25
Market Research of Emergency Distress Device Signals (Brief)	**Jul 25** ★
Establish 2-yr Cooperative Research and Development Agreement's (CRADA) with Industry Partners to Test Suggested Solution	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 2nd Iterative T&E with CRADA Partners	Nov 26
Give Demo to Present Solution to CG-SAR and Other Government Agencies	Feb 27
Single Point Electronic Distress Notifications (Report)	**Sep 27** ★
Project Completion: Sep 27	

Command, Control, Communications, Computers, Cyber, & Intelligence (C5I) Branch Support

9991A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future C5I systems, including: radio frequency communications, electronic navigation systems, software defined radios, cyber security systems, spectrum management, and sensors.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support C5I Strategic Project Portfolio Alignment, CG Cyber Strategic Outlook initiatives, and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding C5I technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense (DOD) labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.

Notes

- Develop a "Sector of the Future" lab setup to assess how technology can transform Sector-level operational decision making and communications.
- Continue to provide Extended Reality subject matter expertise and technical support for HoloLens2 devices in support of RDC ITNET Branch.
- Support Polar Communications testing for RDC and DOD Labs collaborative projects.
- Participate with C5I organizations such as the Radio Technical Commission for Maritime Services (RTCM) and Institute of Navigation.

Sponsor's Rep: CG-926 **Ops Rep:** Various	**Stakeholder(s):** CG-2, CG-6, CG-7, CG-933, C5ISC, CGCYBER, DHS S&T
RDC Research Lead: Ms. Amy Cutting	**CG-926 Portfolio Manager:** Mr. Joshua Henson
Anticipated Outcome/ Transition: Various	

Project Timeline / Key Milestones

Project Start: Ongoing	
RDC Human Subjects Research RDC SOP Team Support	24 Apr 23 ✓
AR/VR/XR Demo for Senior Leadership Conference	4 May 23 ✓
ION Joint Navigation Conference 2023	15 Jun 23 ✓
"Sector RDC" (SRDC) Lab Setup	4 Aug 23 ✓
Migrant Interdiction Operations Requirements (REACT Report)	**8 Aug 23 ✓ ★**
C5I Centralized Annual Training – R&D Panel	20 Sep 23 ✓
Support USCGC HEALY Cruise	6 Oct 23 ✓
IUU Fishing Project Support	14 Mar 24 ✓
Propose SRDC Interoperable Comms Infrastructure	Nov 24
RTCM Working Group Support	Sep 25
Sector of the Future Support	Sep 25
Project Completion: Ongoing	

Next Generation Aids to Navigation Buoys & Alternative Moorings

2703

Mission Need: Modernize U.S. Coast Guard (CG) Aids to Navigation (ATON) buoys and moorings.

Objectives

- Determine the world-wide state of non-ferrous, Next Generation (Next Gen) aids to navigation (ATON) buoys.
- In conjunction with CG managers, field trial the most-promising prospects for replacing steel buoys.
- Provide CG managers technical, cost, and operational benefits (if any) to modernize buoy inventory.
- Conduct follow-up investigation of an alternative buoy-mooring system to determine CG applicability.
- Analyze buoy inventory to identify logistical and operational inefficiencies.
- Develop science-based, analytical tool to aid CG managers with future inventory decisions.
- Field trial and evaluate promising inland river buoy alternatives.
- Evaluate the radar signatures of legacy and Next Gen buoy designs.
- Evaluate mooring analysis software replacement options.

Completed

Notes

- Coordinate with CG-NAV and the Data Center Optimization initiative to involve International Association of Marine Aids to Navigation and Lighthouse Authorities as partners.
- Collaborate with Naval Surface Warfare Center (NSWC) Carderock on buoy radar cross section and detection ranges analysis.
- Coordinate with CG-68 on the transition of MOORSEL replacement.
- NSWC buoy radar reflector study to continue post project completion.

Sponsor's Rep: SILC-WOPL
Ops Rep: N/A

Stakeholder(s): CG-NAV, Districts (dpw), CG-68

RDC Research Lead:
Mr. James Spilsbury

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations for Acquisition Milestone Support
Recommendations for Product Line Tech Insertion

Project Timeline / Key Milestones

Project Start: 1 Oct 19	
Complete World Wide Market Study of Buoys	31 Mar 20 ✓
Next Gen ATON Buoys: Market Study Report (Report)	**17 Sep 20 ✓ ★**
Draft Test Plan for Buoys and Moorings Complete	20 Oct 20 ✓
Next Gen ATON Buoys & Alternative Moorings - Field Test Update (Brief)	**12 Aug 21 ✓ ★**
ATON Buoy Inventory Analysis Tool Development (Brief)	**15 Jun 22 ✓ ★**
Inland River Buoy Field Testing Status (Brief)	**9 Jan 23 ✓ ★**
Mooring Analysis Software & Radar Reflector Update (Brief)	**20 Mar 23 ✓ ★**
Field Test for Buoys and Moorings Complete	10 May 23 ✓
Next Gen ATON Buoys & Alternative Moorings: New Buoy and Moorings Field Trial Summary (Report)	**19 Oct 23 ✓ ★**
Next Gen ATON Buoys & Alternative Moorings: ATON Buoy Cost Comparison Tool & User Guide (Tool & User Guide)	**19 Jan 24 ✓ ★**
Attend & Present at Annual ATON Conference	3 May 24 ✓
Project Closeout Memorandum (Memo)	**6 Jun 24 ✓ ★**
Project Completion: 6 Jun 24	

Emerging Pollution Response Technology Evaluation

1011

Mission Need: Understand the capability of emerging mechanical pollution-response technology.

Objectives

- Conduct market research to identify new and emerging pollution response technologies.
- Conduct independent evaluation of select technologies using the U.S. Coast Guard's (CG) Oil Spill Response Technology Evaluation Process.
- Collaborate with other Federal agencies (Bureau of Safety and Environmental Enforcement (BSEE), Environmental Protection Agency, etc.) to conduct in-water testing of the most promising technologies.
- Provide feedback to equipment providers for consideration in advancing their technologies to enhance the nation's pollution response capability.
- Provide a knowledge product for Federal On-Scene Coordinator (FOSC) awareness of new technologies.

Notes

- Partnership with BSEE.
- Possible use of Cooperative Research and Development Agreements.
- Opportunity to partner with Interagency Coordinating Committee for Oil Pollution Research (ICCOPR) members, Federal Laboratory Consortium members, and academic institutions involved in this area of research.
- Possible collaboration with Blue Technology Center of Expertise (BTCOE) for technology market research.

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

Stakeholder(s): ICCOPR, CG-721, District Response Advisory Teams, FOSCs, National Strike Force, D9 Drat

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

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: 1 Oct 21	
Request for Information (RFI) Issued for Sorbents	5 Jan 22 ✓
In-house Technology Evaluation Conducted	17 May 22 ✓
Emerging Pollution Response Technology (Sorbents), Preliminary Evaluation Results/Way Forward (Brief)	**13 Jul 22 ✓ ★**
Ohmsett Testing of Sorbents Complete	28 Oct 22 ✓
Emerging Pollution Response Technology: Adsorbents (Report)	**28 Jun 23 ✓ ★**
Ohmsett Testing of Mechanical Recovery Complete	31 Oct 23 ✓
Emerging Pollution Response Technology Evaluation: Mechanical Recovery, Dielectric Fluids (Report)	**Sep 24 ★**
Project Completion: Sep 24	

Nearshore and Inland Evaluation of the Estimated Recovery System Potential (ERSP) Calculator

4710

Mission Need: ERSP calculator to include response systems for nearshore/inland operating environment.

Objectives

- Determine if an enhanced version of the existing offshore ERSP calculator provides improved efficiency for planning and response to oil spills.
- Develop an inland ERSP calculator prototype tool.
- Validate ERSP calculator functionality and usefulness through an independent evaluation by a group of National Academies of Sciences, Engineering, and Medicine reviewers.

Notes

- Partnership with Bureau of Safety and Environmental Enforcement (BSEE).
- Transition partnership with Great Lakes National Center of Expertise.

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

Stakeholder(s): BSEE, AREAs

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

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 16	
Feasibility Workshop Completed	21 Jun 17 ✓
Feasibility of Extending the ERSP Calculator for Nearshore and Inland Waterways (Report)	**20 Sep 17 ✓ ★**
Inland ERSP Preliminary Factors, Requirements and Conceptual Model (Report)	**14 Nov 19 ✓ ★**
Inland ERSP Operational Environment Calculator (Design Document)	**29 Jun 20 ✓ ★**
Initial Development of Inland ERSP Calculator Complete	4 Jun 21 ✓
National Academy of Sciences (NAS) Review Complete	9 Sep 22 ✓
NAS Recommended ERSP Calculator Updates Complete	Jul 24
Inland Estimated Recovery System Potential Calculator (Prototype and User Guide)	**Sep 24 ★**
Project Completion: Sep 24	

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	Jul 24
Tool to Develop Hazardous Substance Locations GIS in Captain of the Port Zones (Report)	**Sep 24 ★**

Project Completion: Sep 24

Mass Rescue Lifesaving Appliance (MRLSA)

1205

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.
- 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.

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)	**Jul 24 ★**
Phase 2 Testing	Jan 25
Mass Rescue Lifesaving Appliance (Report)	**Apr 25 ★**
Project Completion: Apr 25	

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

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

1032

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 MSA DL to leverage in-house expertise, 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 U.S. Department of Defense, North Atlantic Treaty Organization, 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** ✓ ★
Field Trial Test Plan	14 Jun 24 ✓
KDP – Sponsor Concurrence on Color Characteristics	Jul 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	

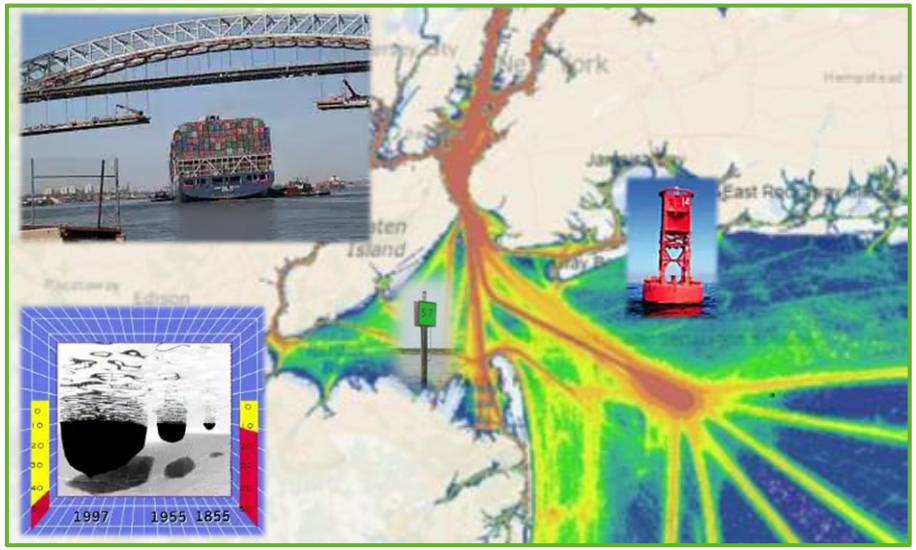
Improve Efficiency and Resiliency in Aids to Navigation (ATON) System Design

1044

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	Aug 24	
Complete Literature Review	Oct 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		

Investigate Effects of Wind Farms on Search Planning

1029

Mission Need: Research the impacts of wind farms on CG SAR.

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:
LCDR Stephen Thomsen

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

Project Timeline / Key Milestones

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

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

1046

Mission Need: Address vessel-safety knowledge gaps concerning lithium batteries and alternative fuels.

Objectives

- Inform fire mitigation strategies, suppression technologies, shipboard battery storage space classifications, and emergency response actions through lithium-ion fire-testing at appropriate facilities.
- Identify knowledge, policy, and regulatory gaps in safety, fire protection, and vessel survivability. Use working groups to identify and prioritize alternative fuel sources (by risk) to inform experimental plans & timelines.
- Develop experimental test plans for each alternative fuel addressing fire risks, personnel hazards, optimal fire suppression procedures, and fuel spill response guidelines.
- Conduct experimental testing for alternative fuels to determine combustion characteristics, biproducts, and human health hazards.
- Inform future policy, procurement, and regulatory considerations among CG-ENG, CG-5RI, and CG platform managers through 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		
Host Alternative Energy Working Groups	Aug 24	
Maritime Lithium-ion Battery Fire and Safety Working Group Summary (Report)	**Nov 24**	★
Maritime Alternative Fuels Fire and Safety Working Group Summary (Report)	**Nov 24**	★
Maritime Alternative Fuels – FY25 Status Update (Brief)	**Nov 25**	★
Complete Lithium-ion Fire Testing	Feb 26	
Maritime Lithium-ion Battery Fire and Safety Test Report (Report)	**Sep 26**	★
Complete Alternative Fuels Fire Testing (Phase 1)	Sep 26	
Maritime Alternative Fuels – FY26 Status Update (Brief)	**Nov 26**	★
Complete Alternative Fuels Fire Testing (Phase 2)	Sep 27	
Maritime Alternative Fuels Fire and Safety Test Report (Report)	**May 28**	★
Project Completion: May 28		

Environment & Waterways (E&W) Branch Support

9993A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future E&W technology, systems, and regulatory directives/policies, including: environmental protection, pollution detection/response, ballast water standards, marine and navigation safety Improvements, and search and rescue improvements.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support E&W Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding E&W technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College & University, and Minority Serving institution students internship opportunities.

Notes

- Radio Technical Commission for Maritime Services meetings and special committees.
- Interagency Coordinating Committee on Oil Pollution Research (ICCOPR).
- Great Lakes Oil Spill Center of Expertise liaison.
- CG-SAR/CGA leeway drift collaboration.
- National Oceanic & Atmospheric Administration Response Oil Assay Work Group.
- Multi-spectral imaging and air quality monitoring sensor evaluation.

Project Timeline / Key Milestones

Project Start: Ongoing	
California Office of Spill Prevention and Response Technical Workshop	29 Mar 23 ✓
BSEE/NOAA Oil Spill Shoreline Response Research Gaps Workshop	11 May 23 ✓
Interagency Coordinating Committee on Oil Pollution Research Q3 Meeting	23 May 23 ✓
Survival Statistics Follow-on Effort	5 Mar 24 ✓
Puma sUAS Training	3 May 24 ✓
International Oil Spill Conference	16 May 24 ✓
Sector of the Future Support	Sep 24
Project Completion: Ongoing	

Sponsor's Rep: CG-926
Ops Rep: N/A

Stakeholder(s): CG-5, CG-SAR, CG-MER, CG-ENG, CG-OES, D9, D11, DHS S&T

RDC Research Lead:
Mr. M. J. Lewandowski

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Various

Extended Reality (XR) Capabilities for Coast Guard Mission Support

8107

Mission Need: Improve efficiency and effectiveness of maintenance and training across the CG.

Objectives

- Enhance the U.S. Coast Guard's (CG) ability to train personnel and perform maintenance on CG assets by identifying maintenance, training, tools, processes, and procedures used by military and industry that will:
  - Reduce the labor burden of technicians by providing current maintenance information via XR technologies.
  - Increase the availability of assets by improving the efficiency of maintenance and reducing costly errors.
  - Improve the effectiveness of training and reduce the time to train personnel.
- Create a roadmap that will enable the sponsor to generate requirements and successfully implement extended reality capabilities throughout the CG to improve the performance of mission support services.

Notes

- Includes partnerships with Naval Sea Systems Command Portsmouth Naval Shipyard, Microsoft Technology Center Boston, and other U.S. Department of Defense components that have successfully adopted XR technologies in their mission support programs.
- Uses agile scrum development and rapid contracting through Defense Logistics Agency's Tailored Logistic Support Program.

Sponsor's Rep: FORCECOM **Ops Rep:** FC-Teps	**Stakeholder(s):** ALC, ATTC, CGA, SFLC, MSC, CG-1B3/ 41/45/5PC/67/751/761/933, TRACEN Yorktown, MSC
RDC Research Lead: Mr. Jack Cline	**CG-926 Portfolio Manager:** Mr. Joshua Henson
Anticipated Outcome/ Transition:	Recommendations on Tech Availability & Applicability Recommendations for Tactics, Techniques & Procedures

Project Timeline / Key Milestones

Project Start: 30 Nov 17	
Market Research/Technology Assessment (Brief)	**19 Dec 18** ✓ ★
HoloLens 2 Upgrade Completed	3 Sep 20 ✓
87' WPB Augmented Reality Maintenance Prototype	18 Sep 19 ✓
Aviation Augmented Reality Maintenance Prototype	2 Feb 21 ✓
Limited User Evaluation - Surface Community (Brief)	**20 Apr 21** ✓ ★
Marine Inspection XR Training Prototype Delivered	31 Jan 22 ✓
Limited User Evaluation - Aviation Community (Brief)	**18 Aug 22** ✓ ★
Limited User Evaluation - Training Community (Brief)	**16 Sep 22** ✓ ★
Mission Support XR Roadmap Complete	17 Nov 23 ✓
Extended Reality Capabilities for Coast Guard Mission Support: Transition Opportunities (Brief)	**21 Dec 23** ✓ ★
XR Capabilities for CG Mission Support (Report & Brief)	**Aug 24** ★
Project Completion: Aug 24	

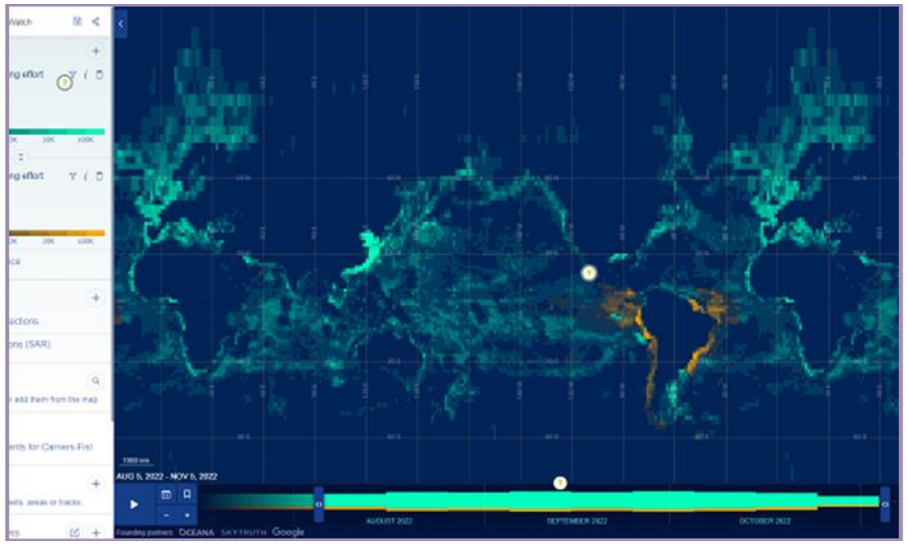
ArcGIS Enterprise Integration of IUU Fishing Detection Information

1006

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.

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. Joshua Henson

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)	**Sep 24 ★**
Project Completion: Sep 24	

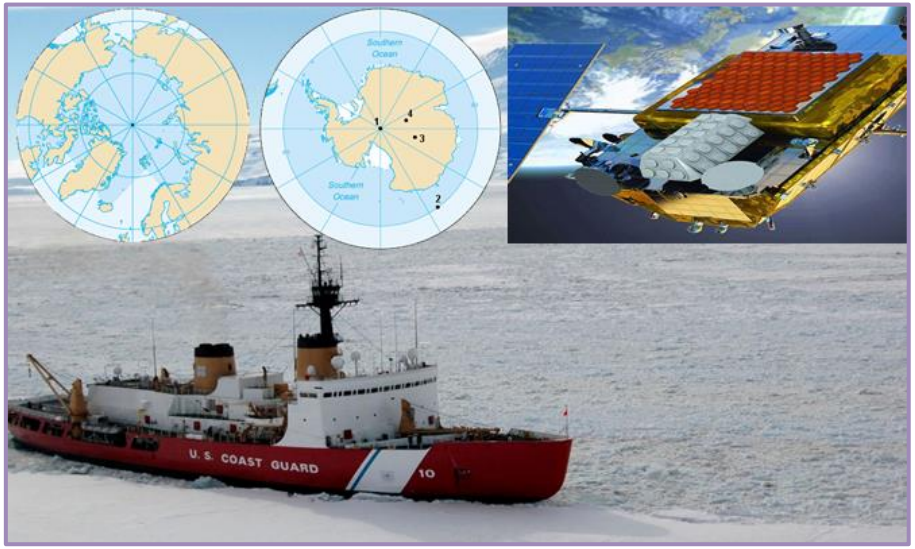
High Latitude Underway Connectivity

8705

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.
- Align with C5ISC SATCOM procurement.
- Link with DoD Lab Sync Arctic Comms effort and International Cooperative Engagement Program for Polar Research.

Sponsor's Rep: CG-761 **Ops Rep:** LANT/PAC-6	**Stakeholder(s):** CG-67, CG-68, CG-751, C5ISC, ALC, CGCYBER
RDC Research Lead: Mr. Jon Turban, P.E.	**CG-926 Portfolio Manager:** Mr. Joshua Henson
Anticipated Outcome/ Transition:	Provide Sponsor/Product Line Tested Prototype

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 ✓ ★**
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.

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** ✓ ★
Phase 3 Field Trials – VDES Evaluation of R-Mode	Sep 24
VDES R-Mode Field Trial Update (Brief)	**Jan 25** ★
Phase 4 Field Trials – Evaluation of VDES-Satellite	Dec 25
VDES R-Mode and Satellite Field Trial Summary (Report)	**May 26** ★
Project Completion: May 26	

Sponsor's Rep: CG-761 **Ops Rep:** CG-NAV	**Stakeholder(s):** CG-67, CG-68, CG-933, CG-NAV, NAVCEN, C5ISC, CGCYBER
RDC Research Lead: LCDR Ryan Cassidy	**CG-926 Portfolio Manager:** Mr. Joshua Henson
Anticipated Outcome/ Transition:	Recommendations for Standards/Regulations/Policy Recommendations for Product Line Tech Insertion

Computer Aided Dispatch

1038

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 feasibly 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. Joshua Henson
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	Oct 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	

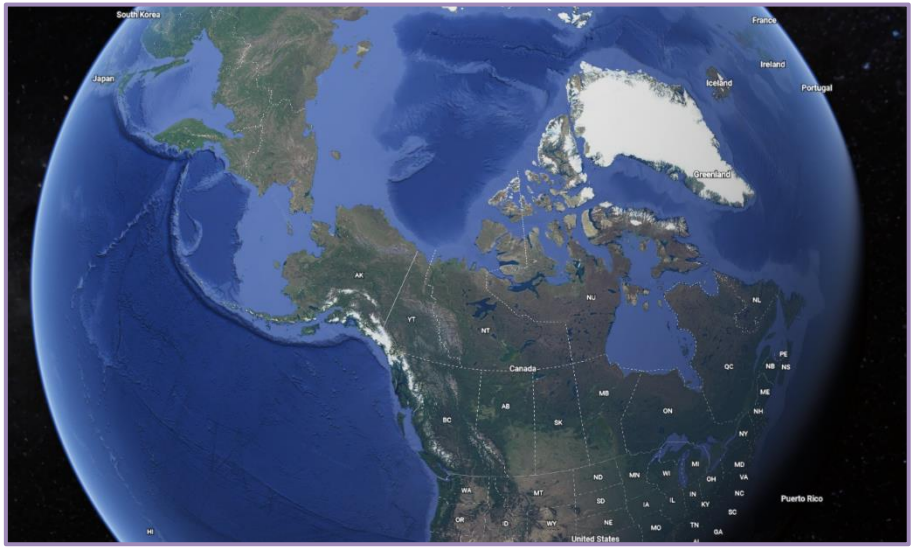
Next Generation Distress Communication Capability for Alaska and the Arctic

1027

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 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 U.S. Department of Homeland Security 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. Joshua Henson
Anticipated Outcome/ Transition:	Recommendations in Tech Availability & Applicability

Project Timeline / Key Milestones

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 Contract Award with L3 Harris	29 Mar 24 ✓
Accommodation Study of Test and Evaluation Plan for DHS S&T's DSC from Space Prototype	Oct 24
DHS S&T Accommodation Study Findings (Report)	**Nov 24 ★**
Software and Algorithm Development, Integration, and Test of RASP prototype	Aug 25
Operational Test and Evaluation of RASP Prototype	Feb 27
Develop DSC Independent RF Geolocation Capability	Aug 27
Next Generation Distress Communication Capability for Alaska and the Arctic (Report)	**Sep 27 ★**
Project Completion: Sep 27	

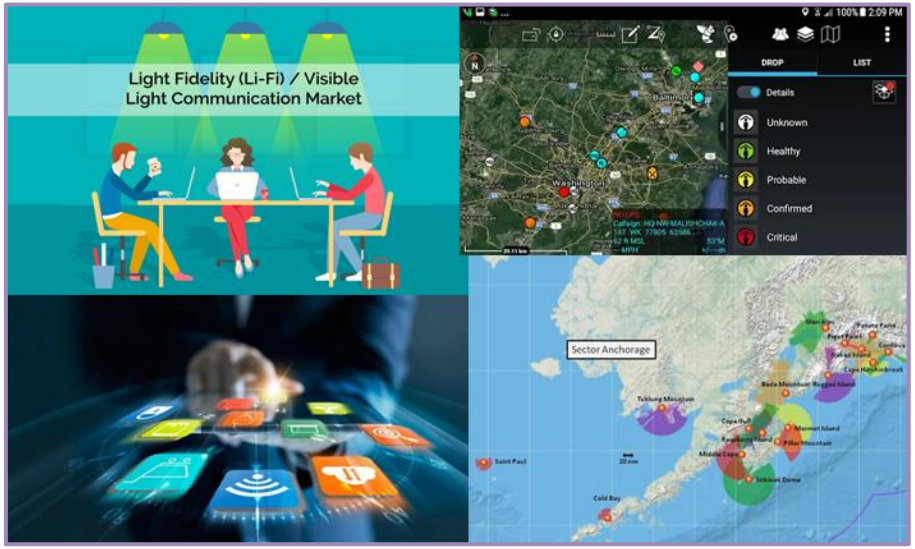
IT & Networks (ITNET) Branch Support

9998A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Build U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge/understanding of innovative Information Technology, Networked Systems & Cyber Tools, including: CG mobility, software prototyping, cloud computing, software defined networks, mixed reality, next generation networking, space-based systems, and cyber security systems.
- Support ITNET Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities; Maintain Branch infrastructure to support RDC Portfolio objectives.
- Establish robust relationships with CG sponsors/stakeholders and external U.S. DoD labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Partner with CGCYBER & C5ISC – learn about Cyber Protection/Mission Team business and toolkits to position future research support.



Notes

- Support development of a "Sector of the Future" (SoF) lab to assess how technology can transform Sector-level operation decision-making and communications.
- Test & evaluate proof of concept for unit level implementation of software defined radios over an Internet connection.
- Develop Team Awareness Kit capability.
- Evaluate light fidelity (LiFi) network as next generation networking capability.
- Support DHS S&T to evaluate PTT tech for integration w/ local & state OGAs.
- Engage with FEMA to support congressional mandate for cellular distress alerting.

Sponsor's Rep: CG-926 **Ops Rep:** N/A	**Stakeholder(s):** CG-2, CG-6, CG-7, C5ISC, CGCYBER, DHS S&T
RDC Research Lead: LCDR Ryan Cassidy	**CG-926 Portfolio Manager:** Mr. Joshua Henson
Anticipated Outcome/ Transition: Various	

Project Timeline / Key Milestones

Project Start: Ongoing

Functional ISR Buoy Prototype	31 May 24 ✓
Alaska & Arctic HF Comms Modeling Report	Jun 24
CGMOES Transition to CG-771	Jun 24
LiFi Technical Note	Jul 24
Software-Defined Radio Technical Note	Sep 24
Sector of the Future Support	Sep 24
SMS Distress Alerting REACT Report	Feb 25

Project Completion: Ongoing

Cognitive Training for High-Risk Operators

8206

Mission Need: Enhance cognitive skills and decision-making in high-risk operations.

Objectives

- Research objective measurements that demonstrate the influence of selected cognitive training program(s) on training environment evaluations.
- Develop a research framework for collecting empirical evidence of performance enhancement in the training environment.
- Develop understanding of impact cognitive training programs have on trainees' performance.
- Develop recommendations for one or more cognitive training programs for evaluation in an operational setting.

Completed

Notes

- Potential collaboration with CG Auxiliary, Naval Health Research Center in San Diego, Naval Medical Research Unit Dayton, and Naval Special Warfare Command.

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

Stakeholder(s): FORCECOM, MLEA, SMTC, CG-1, MSRT/MSSTs, DoD Spe. Ops, NUSTL, LE/DSF Cmty's

RDC Research Lead:
Dr. Jared Peterson

CG-926 Portfolio Manager:
Dr. David Wiesenhahn

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

Project Timeline / Key Milestones

Project Start: 30 Nov 20

Researched Objective Measures	31 Mar 21 ✓
Experimental Design and Cognitive Training Market Research Selection (Brief)	**25 Jan 22 ✓ ★**
Cognitive Training Influence on Cognitive Skills and Decision-Making (Report & Brief)	**9 Jan 24 ✓ ★**

Project Completion: 9 Jan 24

Artificial Intelligence/Machine Learning (AI/ML) for Computer Imagery and Sensor Data

1003

Mission Need: Develop, deploy, and sustain artificial intelligence in support of CG missions.

Objectives

To maintain efficiency and improve mission performance, the CG must capitalize on new sensor data sources and technologies such as artificial intelligence and machine learning. To realize the benefits, the CG must:

- Understand the algorithms, software, platform, and service infrastructures available from Department of Homeland Security (DHS), Department of Defense (DoD), National Geospatial-Intelligence Agency (NGA), and other Federal partners for Artificial Intelligence development, deployment, and sustainment.
- Understand the hardware, network, edge, and cloud computing infrastructures in the CG and from Federal partners for AI deployment and operations to support the "edge to watchstander pipeline."
- Examine how imagery and other sensor data can be used in real time to support operators and in post-analysis to support analysts.

Notes

- Track and report on federal partner and commercial AI models and methods in sensor fusion, maritime domain awareness, and pattern of life.
- Track and report on what other DoD, DHS, NGA partners are using and building for their physical and networking AI infrastructure.
- Follow Small Business Innovation Research-Other Agency Technology Solutions, Naval Postgraduate School, U.S. Navy, Joint Artificial Intelligence Center, Air Force Institute of Technology, CT National Guard, National Security Innovation Network, and Intelligence Coordination Center.

Sponsor's Rep: CG-2
Ops Rep: D11(dre)

Stakeholder(s): CG-741, CG-62, CG-MLE, AREAs, Districts, CGCYBER, CG-MER

RDC Research Lead:
LT Ardy Effendi

CG-926 Portfolio Manager:
Dr. David Wiesenhahn

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: 1 Oct 21	
Understand the Current State of CG Edge Sensors	30 Mar 22 ✓
Explore Development Platforms	29 Jul 22 ✓
AI/ML for Computer Imagery and Sensor Data – Progress Update 1 (Brief)	**21 Nov 22 ✓ ★**
Understand State of Edge Sensor Networking	30 Dec 22 ✓
Explore Deployment Platforms	29 Sep 23 ✓
AI/ML for Computer Imagery and Sensor Data – Progress Update 2 (Brief)	**6 Nov 23 ✓ ★**
Capture and Understand Asset Sensor Vignette	28 Feb 24 ✓
Investigate and Compare Development Platforms	11 May 24 ✓
AI/ML for Computer Imagery and Sensor Data (Report)	**Aug 24 ★**
Project Completion: Aug 24	

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 Wiesenhahn

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	Sep 24
USNA NSC Sensor Data Analysis	Sep 24
CBM for CG Asset Product Lines Summary Report (Report)	**Sep 24 ★**

Project Completion: Sep 24

Persistent Simulation for the CG Workforce

1031

Mission Need: Simulation tool to forecast strategic workforce needs and inform HR policy decisions.

Objectives

- Provide an efficient approach to make quantitative analysis-based recommendations about Human Resource (HR) policy decisions at a strategic level.
- Explore and/or build a modeling framework and predictive simulation tool that will help analysts examine HR data in a more efficient manner to forecast workforce demands at various points in the future (e.g., 2, 5, 10, or etc. years).
- Develop a framework for a Verification, Validation, and Accreditation approach to address policy/strategy workforce questions for decision-makers and programs.

Notes

- Conduct research to support the Ready Workforce 2030 strategy and Commandant's Intent.
- Agent based simulation modeling is a well-known approach in literature, and it's promising for this instance.
- Explore collaboration with other partner and military agencies who have addressed this problem space.
- Explore collaboration with the U.S. Department of Homeland Security Science and Technology Directorate Office of University Programs.
- Collaborate with CG Academy faculty on model development.

Sponsor's Rep: DPR **Ops Rep:** N/A	**Stakeholder(s):** CG-5, CG-7, CG-12, CG-13, CG Recruiting Command, CG-PSC, CGA, CG-PAE
RDC Research Lead: Mr. Sam Cheung	**CG-926 Portfolio Manager:** Dr. David Wiesenhahn
Anticipated Outcome/ Transition:	Provide Sponsor/Product Line Tested Prototype Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: 3 Oct 22	
Investigate Current Research Efforts and Explore Current Commercial/ Government Off The Shelf (COTS/GOTS) Products that Supports this Effort's Decision Framework and Simulation Modeling Concept	16 Dec 22 ✓
Decide On Whether to Purchase COTS/GOTS, Acquire Contractor Services, and What Resources Are Required	30 Dec 22 ✓
Persistent Simulation for the CG Workforce – Key Decision Point (KDP) (Brief)	**26 Apr 23** ✓ ★
Develop the Framework and Simulation Model In-line with KDP Outcome	31 Oct 23 ✓
Test/ Evaluate the Framework and Model in RDC Test Evaluation cloud environment	28 Jun 24 ✓
Persistent Simulation for the CG Workforce (Report)	**Sep 24** ★
Project Completion: Sep 24	

SAR Risk Matrix to Reexamine the 2-Hour Response Standard

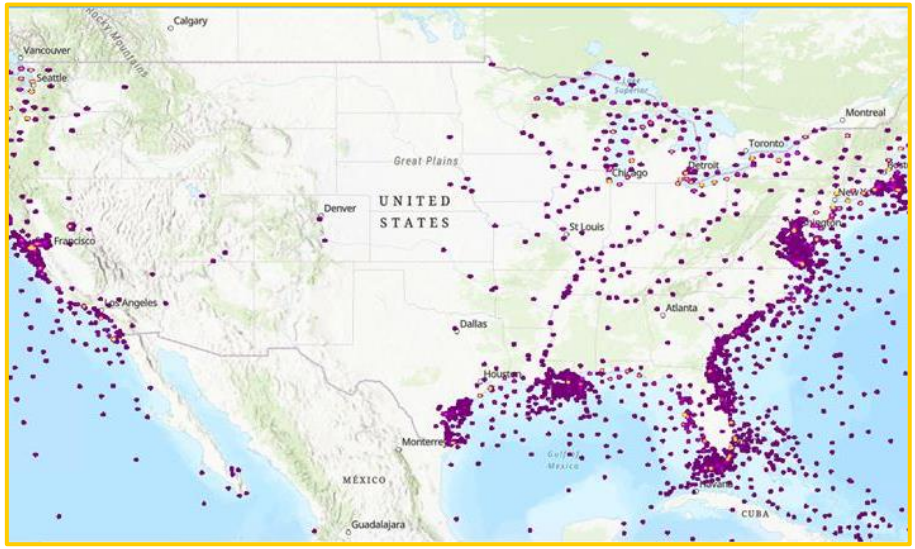
1039

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

Objectives

Current 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.



Notes

- Research can build on existing analytic 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:** N/A	**Stakeholder(s):** CG-MLE, CG-MSR, CG-MER, CG-771, CG-731, CG-741, LANT/PAC
RDC Research Lead: Ms. Christine Mahoney	**CG-926 Portfolio Manager:** Dr. David Wiesenhahn
Anticipated Outcome/ Transition:	Recommendations for Standards/Regulations/Policy Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: 1 Apr 24

Literature Review of SAR Response Standard and Emergency Response Siting Methodologies Complete	Aug 24
Definition of Constraints for New Siting Methodology Complete	Oct 24
Prototype Risk and Response Tool Complete	Apr 25
Develop Analytical Approach to Model SAR Risk and Response Complete	May 25
SAR Risk and Response Methodology (Brief)	**Jun 25** ★
SAR Risk and Response Tool (Report)	**Jun 26** ★

Project Completion: Jun 26

Generative Artificial Intelligence Across Disparate Data Sources Tailored for CG Applications

1042

Mission Need: Actionable mission support insights from large data sets.

Objectives

- Digest resources and return an efficient, immediate route to solutions to queries with advanced Artificial Intelligence (AI) tools using a repeatable, exportable process.
- Develop a process that includes:
  - Data preparation,
  - Model development, and
  - Model deployment.
- Use the developed process to inform CG use of tools such as natural language processing, large language models, and generative AI.

On Hold

Notes

- This work will advance a future-focused, integrated approach to design, deploy, and sustain workforce/assets/infrastructure/logistics support.
- Use cases may include case narrative analysis, maintenance assistance, law enforcement procedure verification, and more.
- Partnership opportunity with the Department of Defense (DoD) research labs who have begun exploring generative AI models inside DoD information network firewalls.
- Partnership opportunity with CG-ODA and CG Academy.

Sponsor's Rep: CG-DCO-51 **Ops Rep:** N/A	**Stakeholder(s):** CG-2, CG-4, CG-6, CG-PAE, CG-SAR, CGA, CG-MER
RDC Research Lead: LT Ardy Effendi	**CG-926 Portfolio Manager:** Dr. David Wiesenhahn
Anticipated Outcome/ Transition:	Recommendations on Tech Availability & Applicability Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: TBD	
Define a Data Preparation Process	Oct 25
Explore Modeling Environments	Oct 25
Generative AI Across Disparate Data Sources Tailored for CG Applications – Update Brief 1 (Brief)	**Oct 25** ★
Evaluate Modeling Approaches	Nov 25
Train Model	Apr 26
Generative AI Across Disparate Data Sources Tailored for CG Applications – Update Brief 2 (Brief)	**Oct 26** ★
Develop Deployment Use Case	Oct 26
Derive Mission Performance Insights	Jan 27
Generative AI Across Disparate Data Sources Tailored for CG Applications (Report)	**Sep 27** ★
Project Completion: Sep 27	

Improved Sensor Performance Models for Search and Rescue

1048

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.

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 Wiesenhahn

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

Project Timeline / Key Milestones

Project Start: 4 Apr 24		
Definition of Combinations of Sensor, Search Asset, and Search Object for Validation Complete	Oct 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		

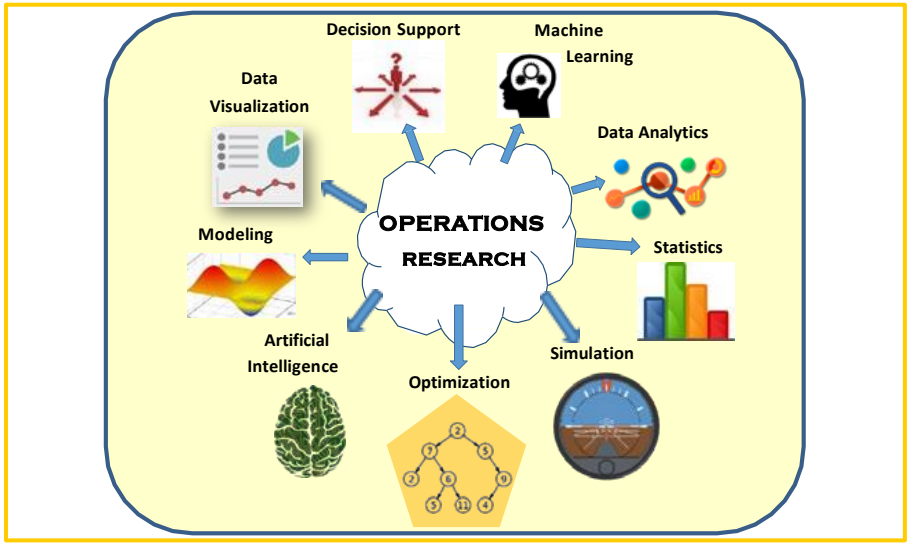
Modeling, Simulation, & Analysis (MSA) Branch Support

9997A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain competency and technical knowledge in understanding present and future Operations Research (OR)/Data Analytics (DA) tools and techniques including: modeling & simulation, data analytics, Artificial Intelligence (AI) & Machine Learning (ML), process automation, risk analysis, and human factors.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support MSA Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding use and application of AI/ML and OR/DA technologies and techniques.
- Foster continued relationships with CG sponsors/stakeholders and external Department of Defense labs, Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black Colleges and Universities, and Minority Serving Institutions students internship opportunities.



Notes

- Represent CG on Chief Digital and Artificial Intelligence Office (CDAO) Service Lab AI Research and Development Subcommittee; CDAO Predictive Maintenance Subcommittee; and Tri-Service Lab Commander's Sync Data Analytics Working Group.
- Member of CG-7 Unmanned Systems Integrated Product Team (AI Subcommittee); CG OR/DA Working Group, CG Data Readiness Task Force Advisory Group, CG Modeling & Simulation Advisory Council, and RDC Institutional Review Board.

Sponsor's Rep: CG-926 **Ops Rep:** N/A	**Stakeholder(s):** CG-1/2/6/7/9, CG-5R, CG-5P, DRTF/OD&A, CG-PAE, DCO-X, DHS S&T
RDC Research Lead: CDR Julie Harder	**CG-926 Portfolio Manager:** Dr. David Wiesenhahn
Anticipated Outcome/ Transition: Various	

Project Timeline / Key Milestones

Project Start: Ongoing

Natural Language Processing Analysis of Unstructured Search and Rescue Narratives (CGA Partnership)	18 May 23 ✓
Great Lakes Ice Breaker Analysis Alternatives	9 Jun 23 ✓
MORS 2024 (Naval Post-graduate School)	28 Jun 24 ✓
Sector of the Future Support	Sep 24
Joint Capability Technology Demonstration: Wide-Area Autonomous Maritime Target Detect and Classifications Technology Demonstration Support	Jul 25

Project Completion: Ongoing

Bromine-Free Water Purification System

5507

Mission Need: Evaluate newer, less hazardous water purification systems.

Objectives

- Deliver decision support information regarding effective utilization of bromine-free water purification systems for National Security Cutters (NSC), Fast Response Cutters (FRC), and Operational Patrol Cutters (OPC).

Completed

Notes

- Legislative requirement.
- Collaborating with the U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory; Naval Surface Warfare Center – Carderock Division, Corona Division, Crane Division, Philadelphia Division; and U.S. Naval Research Laboratory.

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

Stakeholder(s): CG-45, SFLC-LRE

RDC Research Lead:
Ms. D. J. Hastings

CG-926 Portfolio Manager:
LCDR Stephen Thomsen

Anticipated Outcome/ Transition: Recommendations for Acquisition Milestone Support

Project Timeline / Key Milestones

Project Start: 27 Jul 19	
Bromine-Free Water Purification Partners Identified and Pilot Study Started (Phase 1)	19 Jun 20 ✓
Bromine-Free Water Purification System Pilot Study (Brief) (Phase 1)	**9 Jul 20** ✓ ★
Begin CG Compatibility Review of Bromine-Free Systems on FRC and OPC with NSWC Carderock (Phase 2)	8 Sep 21 ✓
Bromine-Free Water Purification System Summary: Phase I (Report)	**8 Dec 22** ✓ ★
Bromine-Free Systems Integration Feasibility Study (Phase 2)	27 Oct 23 ✓
Phase II Bromine-Free Disinfection Final Report (Report)	**20 Dec 23** ✓ ★
Project Completion: 20 Dec 23	

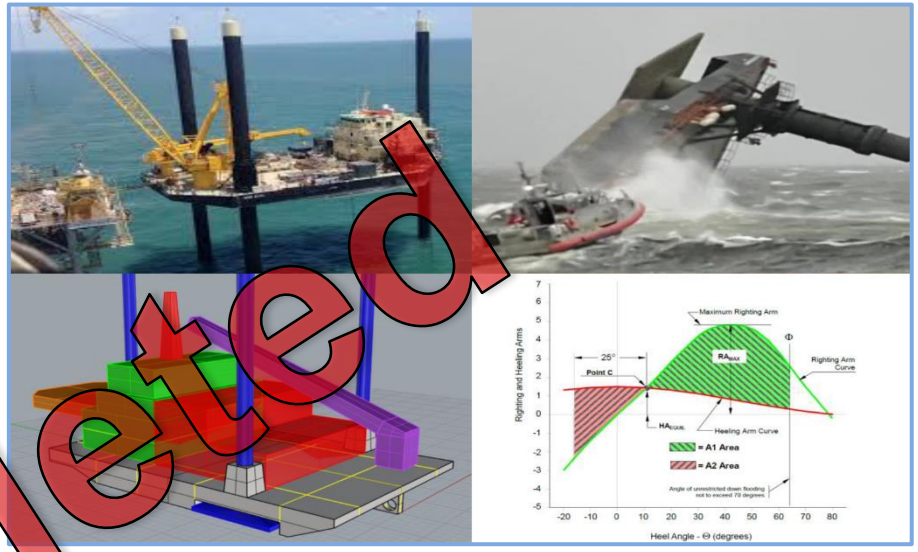
Improve Liftboat Stability Standards

1024

Mission Need: Mitigate stability-related hazards to Liftboats/operators.

Objectives

- Conduct "Non-Ship Shape Vessel Stability Requirements" study.
  - Investigate current CFR, ABS, and CG Liftboat Stability Standards and Regulations.
  - Analyze critical axes of hull design and construction variations through different stability calculation methods.
  - Incorporate Time Domain Simulations to investigate effects of wind and waves on Non-Traditional Hull Forms.
  - Develop mitigation strategies tailored to Liftboat classifications.
- Support classification and regulation revision process as appropriate.



Completed

Notes

- Leverage Sponsor activities to conduct "Non-Ship Shape Vessel Stability Requirements" study.
- Leverage current American Bureau of Shipping guidance for building and classing Liftboats.
- Leverage the National Academies of Sciences, Engineering, and Medicine resources.
- Leverage State Maritime Academies.

Sponsor's Rep: CG-ENG
Ops Rep: D8 (do)

Stakeholder(s): CG-5P/INV, D8, CG Outer Continental Shelf National COE, CG Marine Safety Center, LANT

RDC Research Lead:
LT Dean Gilbert

CG-926 Portfolio Manager:
LCDR Stephen Thomsen

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

Project Timeline / Key Milestones

Project Start: 1 Oct 21	
Liftboat Observation at D8	11 Mar 22 ✓
Liftboat Stability Standards Recommendations (Brief)	**31 Jul 23 ✓ ★**
Stability Analysis and Testing Complete	15 Sep 23 ✓
Developed/Revised Liftboat Regulation Changes	27 Oct 23 ✓
Non-Traditionally Shaped Vessel Stability Standards (Report)	**12 Feb 24 ✓ ★**
Project Completion: 12 Feb 24	

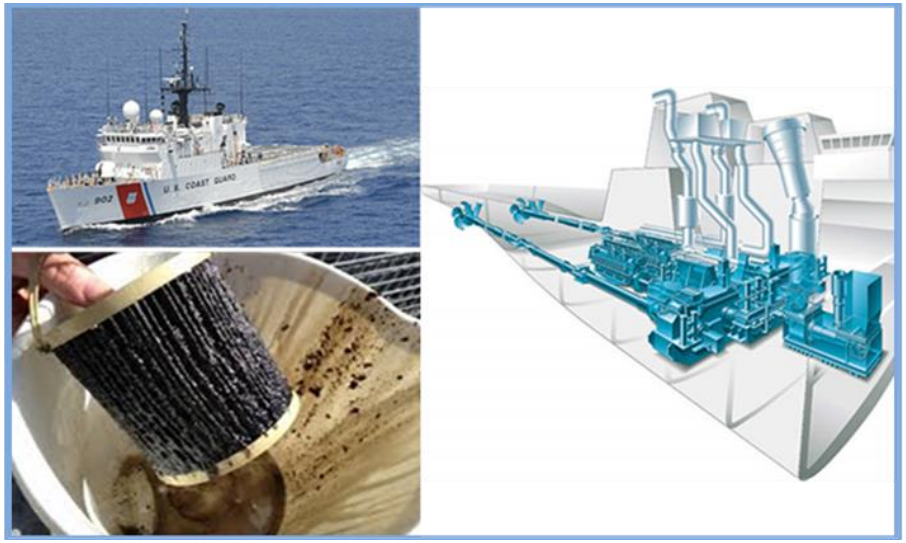
Engine Combustion Enhancement Technology

1002

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 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 Timeline / Key Milestones

Project Start: 1 Oct 21

Engine Combustion Enhancement Technology: Down Selection (Brief)	**9 Feb 23** ✓ ★
Biocide Laboratory Testing Complete	29 Sep 23 ✓
Engine Prototype Testing Complete	May 24 ✓
Fuel Additive Analysis for Ultra Low Sulfur Marine Gas Oil, JP-5, and F-76 (Application Note)	**Jul 24** ★
Engine Combustion Enhancement Technology (Report)	**Aug 24** ★

Project Completion: Aug 24

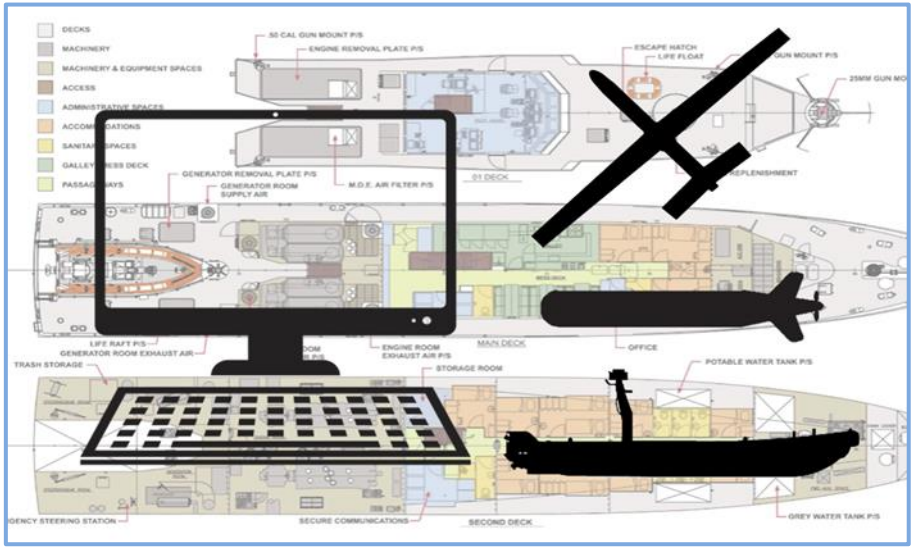
Cutter-Based Uncrewed Systems (UxS) Integration Analysis

1028

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 USCG 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 Post Graduate 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, CG-1B3
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 CONOP Exercises	23 Apr 24 ✓
Cutter-based UxS Integration (Brief)	**Jul 24** ★
D7 OP DEMO	Sep 24
Mission Integration Workshop Program (Brief)	**Nov 24** ★
Mission Integration Workshop	Dec 24
Cutter-based UxS Integration (Report)	**Apr 25** ★

Project Completion: Apr 25

UxS Integration in Coast Guard SAR Operations

1043

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

Objectives

- Identify critical gaps in current 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 National Academies of Science study 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, CG-1B3

RDC Research Lead:
Ms. Marie Whalen

CG-926 Portfolio Manager:
LCDR Stephen Thomsen

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability

Project Timeline / Key Milestones

Project Start: 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

1030

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

Objectives

- Assess Supervisory Control and Data Acquisition (SCADA) implementation across CG cutter classes.
- Investigate Military/Other Government Agency (OGA)/Commercial vessel SCADA data transfer technology maturity & 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

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

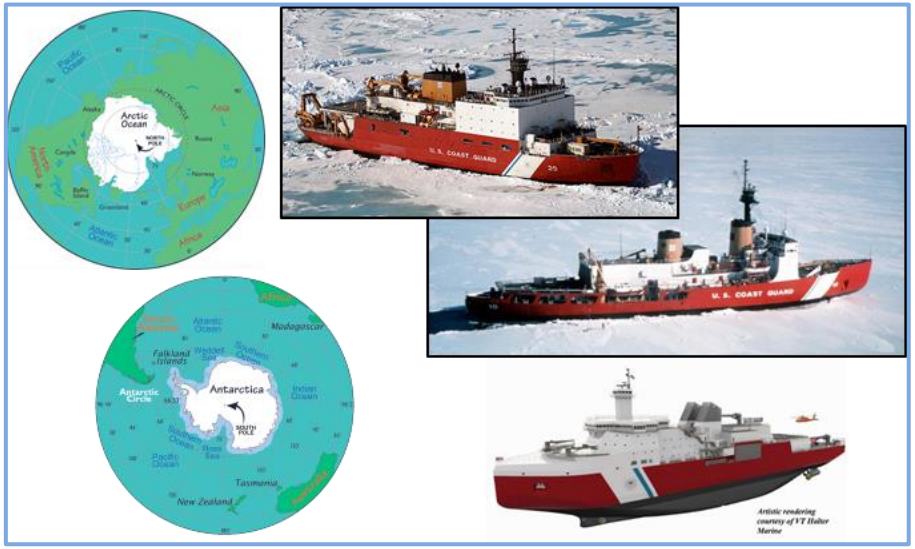
Polar Regions Technology Evaluation 2023-2025

1026

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 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.



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 Timeline / Key Milestones

Project Start: 3 Oct 22	
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)	**Jul 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
FY24 PRTE (Application Note)	**Jun 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	

Surface Branch Support

9994A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future surface asset technology and systems including: uncrewed surface & sub-surface systems; boarding team tools; compel compliance; law enforcement; Chemical, Biological, Radiological, Nuclear, and Explosives countermeasures; alternative energy; and polar region capabilities.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support Surface Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding surface technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense labs, U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T) and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.

Notes

- Explore uncrewed surface vessel infrastructure and mission integration.
- RDC Arctic/Polar Coordinator and Representative to U.S. Arctic Research Commission.

Project Timeline / Key Milestones

Project Start: Ongoing

Uncrewed Aerial System/USV Collaborative Tasking	17 Jul 23 ✓
Cutter-based USV Concept of Operations Development	6 Sep 23 ✓
Drug and Explosive Detection Tech Capstone Support	Jul 24
Counter-Uncrewed Underwater Vehicle Benchmarking	Aug 24
Sector of the Future Support	Sep 24
Joint Capability Technology Demonstration Wide-Area Autonomous Maritime Target Detect and Classification Technology Demonstration Support	Jul 25

Project Completion: Ongoing

Sponsor's Rep: CG-926
Ops Rep: Various

Stakeholder(s): CG-43, CG-45, CG-5PW, CG-721, CG-731, CG-751, CG-7 UxS, CG-932, SFLC, DHS S&T

RDC Research Lead:
Mr. Evan Gross

CG-926 Portfolio Manager:
LCDR Stephen Thomsen

Anticipated Outcome/ Transition: Various

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
Smart Buoy 2.0	*Develop deployable ISR Buoy prototype that incorporates enhancements identified in ISR buoy 1.0 deployed in Long Island Sound.* *Result: The Smart Buoy is RDC asset to test sensors and data packet transmission. Individual summaries of different sensor, data, power, system evaluations will be identified and released throughout lifecycle of the asset.*	N/A	N/A
FlightWave Edge 130 Uncrewed Aircraft System (UAS)	*Evaluate FlightWave Edge 130 UAV as an enhanced GUPPI Program UAV.* *Result: RDC evaluated the sUAS Flightwave Edge 130 as a possible commercial sUAS solution. It was determined that at this time the sUAS is not a viable solution and is not ready to be used in field operations. Additional engineering is needed to ensure marine operations and ease of use.*	N/A	N/A
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	Jul 2024
Sharrow Propeller Performance Testing	*Conduct field test and evaluate Sharrow Propellor on 29ft RBS to determine power and efficiency*	CG-731/SBPL	Sep 2024

Rapid Reaction Technology (RRT) Branch Support

9995A

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future technology to support CG mission execution.
- Maintain a collaborative relationship between the CG's Research, Development, Test and Evaluation Program Office and the U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T) along with Department of Defense, Department of Energy, and the Federal Laboratory Consortium to share and advance technologies that will be mutually beneficial to both parties.
- Provide Tactics, Techniques and Procedures for use in development of requirements for new technology evaluations and transitions.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support Strategic Project Portfolio and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding advanced technologies.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.

Notes

- Align with DHS S&T Integrated Project Team gaps and CG Idea Submission Review input.
- Support RDC tasks as requested.

Sponsor's Rep: CG-926
Ops Rep: N/A

Stakeholder(s): DHS S&T, Various

RDC Research Lead:
Mr. Scott Fields

CG-926 Portfolio Manager:
Ms. Minh-Thu Phan

Anticipated Outcome/ Transition: Various
Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: Ongoing

Waterways Commerce Cutter Sonar Evaluation (RRT Note)	**28 Apr 23** ✓ ★
ISR Buoy for MDA	Sep 24
Sector of the Future Support	Sep 24
FY24 Support	Sep 24
Joint Capability Technology Demonstration Wide-Area Autonomous Maritime Target Detect and Classification Technology Demonstration Support	Jul 25

Project Completion: Ongoing

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

OTA1

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.

Sponsor's Rep: CG-9313
Ops Rep:

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

Project Timeline / Key Milestones

Project Start: 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

RDC Evergreen Pinecone in Collaboration with DCO-X

Evergreen1

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 Coast Guard. 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 R&D initiatives for the coming decades.
- RDC supports Pinecone events as Science Advisors to the Service.

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.

Sponsor's Rep: DCO-X
Ops Rep: N/A

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

Project Timeline / Key Milestones

Project Start: Ongoing		
Space Evergreen Pinecone	23 Sep 21 ✓	
Space Evergreen Quick Look	8 Oct 21 ✓	
Space Evergreen (Report)	**28 Oct 21** ✓	★
Climate Evergreen Pinecone	31 Aug 22 ✓	
Climate Evergreen Quick Look	7 Oct 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** ✓	★
Integrated Deterrence Evergreen Pinecone	Sep 24	
Integrated Deterrence Evergreen Quick Look	Oct 24	
Integrated Deterrence Evergreen (Report)	**Jan 25**	★
Project Completion: Ongoing		

Sector of the Future

Sector1

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 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, 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 CONOPS and TTPs through cooperative research and partnerships.

Notes

- Build on past and future technology and MDA sprints, e.g., D14 Low-Cost MDA project (2020), D8 MBL Autonomy (2023), and D7 BVLOS (2023).
- Aligns with 2022 VCG SAR & 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 these two locations. RDC may also conduct in-situ sprints at other locations where appropriate.

Sponsor's Rep: CG-741
Ops Rep: CGD1

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

RDC Research Lead:
CDR Julia Harder

CG-926 Portfolio Manager:
N/A

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

Project Timeline / Key Milestones

Project Start: Ongoing

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)	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