



# Acquisition Directorate

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## Research, Development, Test & Evaluation

# FY17 RDT&E Project Portfolio



UNCLAS | FY17 RDT&E Project Portfolio  
RDC | T. Girton | August 2016



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# Acquisition Directorate

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## Research, Development, Test & Evaluation

# FY17 Project Portfolio



# CG RDT&E Funded Projects



# Library of Visual, Night Vision Goggles, RADAR, and Thermal Detection Signatures

**Mission Need:** A library of physics-based detection models for targets of interest are needed as typical search objects for sensor performance.

## Project Objectives:

- Research current state of modeled search objects.
- Determine approach for potentially grouping multiple types of similar search objects.
- Determine level of fidelity needed for physics based models.
- Prioritize objects for inclusion.
- Provide recommendations for generation of models for inclusion into Search and Rescue Optimal Planning System (SAROPS) and RDC sensor performance models.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Interagency Agreement/Military Interdepartmental Purchase Request/Technical Area Task.....	Mar 17
Interim Report -- Recommendations.....	Oct 17
Interim Report—Methods/Samples of Target Generation/Edits....	Feb 18
★ <b>Final Report - Methods to Generate Relevant Physics Based Models .....</b>	<b>Sep 18</b>
Project End.....	Sep 18

**Sponsor:** CG-SAR

**Stakeholder(s):** CG-711, ATC Mobile, LANT, PAC

<b>Project #:</b> 2016-31	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Supports the Coast Guard Western Hemisphere Strategy.
- Potential for collaboration/partnership with Department of Homeland Security Science and Technology Office of University Programs, CG Academy, and U.S. Customs and Border Protection.

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★ Indicates RDC product.

# Maritime Counter Unmanned Aircraft Systems

**Mission Need:** Methods to detect, track, classify, and mitigate illicit usage of Unmanned Aircraft Systems (UAS) in maritime environment.

## Project Objectives:

- Collect sponsor/stakeholders for end-user requirements for Counter Unmanned Aircraft System (cUAS) capabilities.
- Conduct market research for technologies capable for detecting, tracking, classifying, & mitigating UAS.
- Assess capabilities & limitations of available technologies, specifically addressing integration issues/concerns.
- Conduct multiple counter UAS system demonstrations in various maritime environments, including onboard a vessel at sea, a vessel in a port or waterway, and at a port facility.
- Provide project sponsor/stakeholders a plan for future counter UAS integration & implementation.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Collect End-user Requirements.....	Jan 17
cUAS Technology Request for Information.....	Jun 17
★ <b>Market Research &amp; Preliminary cUAS Technology Assessment Report.....</b>	<b>Oct 17</b>
Broad Area Announcement for cUAS Demonstrations.....	Apr 18
Counter UAS Demonstrations.....	Aug 18
★ <b>Maritime cUAS Final Report.....</b>	<b>Nov 18</b>
Project End.....	Dec 18

**Sponsor:** CG-MSR  
**Stakeholder(s):** CG-711, CG-721, CG-751, LANT, PAC, DHS S&T

**Project #:** 2017-16  
**Expected Benefit:** Improve operational performance/efficiency/mission execution/resiliency

**Notes:**

- This effort will leverage partnerships with Department of Homeland Security Science and Technology Directorate and Department of Defense.
- Supports the Coast Guard Western Hemisphere and Cyber Strategies.

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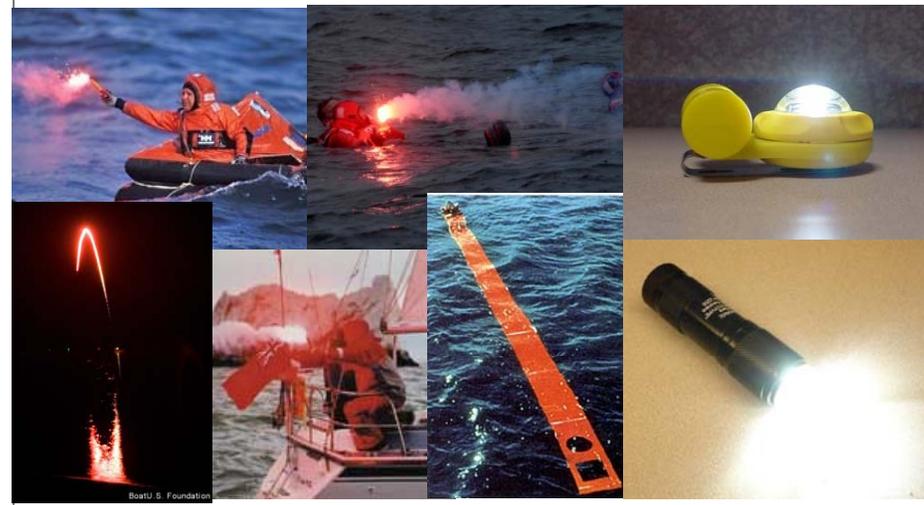


# Alternatives to Pyrotechnic Distress Signals

**Mission Need: Improve distress signal devices.**

## Project Objectives:

- Determine suitability of potential alternatives to pyrotechnic visual distress signals.
- Narrow the optimal distress signal characteristics range by evaluating human-subject response to laboratory generated visual-stimuli.
- Validate laboratory findings through human-subject field test.
- Recommend optimal visual distress signal characteristics.
- Investigate near-Infrared (IR) signal characteristic to allow detection by filtered night vision imaging systems.
- Investigate and develop Safety of Life at Sea (SOLAS) acceptable electronic Visual Distress Signal (eVDSD) characteristic.
- Conduct field testing to ensure actual capability.



## Key Milestone / Deliverable Schedule:

Project Start .....	1 Nov 10 ✓
Visual Comparisons and Use Testing.....	9 Nov 11 ✓
★ <b>Suitability of Potential Alternatives to Pyrotechnic Distress Signals.....</b>	<b>31 Jan 12 ✓</b>
Field Testing.....	19 Sep 14 ✓
★ <b>Alternatives to Pyrotechnic Distress Signals; Laboratory and Field Studies.....</b>	<b>30 Jan 15 ✓</b>
★ <b>Alternatives to Pyrotechnic Distress Signals, Supplemental Report: Near-IR Characteristic.....</b>	<b>31 Aug 15 ✓</b>
★ <b>Interim Report – Development of a SOLAS eVDSD .....</b>	<b>Nov 16</b>
★ <b>Final Report – Test of SOLAS eVDSD.....</b>	<b>Aug 17</b>
Project End .....	Sep 17

★ Indicates RDC product.

**Sponsor:** CG-ENG

**Stakeholder(s):** CG-SAR, CG-BSX, DoD

<b>Project #:</b> 1101	<b>Expected Benefit:</b> Influence international standards
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### Notes:

- Supports the Coast Guard Western Hemisphere Strategy.

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# Airborne Oil Spill Remote Sensing and Reporting

**Mission Need:** Tactics, Techniques, and Procedures (TTP) for optimizing the use of existing CG airborne C4ISR systems to support oil spill response operations.

## Project Objectives:

- Baseline current CG airborne capabilities for Detecting, Mapping and Reporting (DMR) oil spills.
- Join with Bureau of Safety and Environmental Enforcement (BSEE) to explore oil thickness remote detection capability.
- Conduct airborne oil spill DMR testing.
- Document issues in CG oil spill DMR within context of hardware, operator training and environmental conditions; then work with Aviation Training Center (ATC) Mobile to develop TTPs.



## Key Milestone / Deliverable Schedule:

Project Start.....	20 Nov 13 ✓
Key Decision Point to Develop Joint Project w/BSEE.....	29 Jul 14 ✓
Task 1, 2 & 3 White Paper.....	8 Oct 14 ✓
CG Sensor Field Evaluation A.....	24 May 15 ✓
CG Sensor Field Evaluation B.....	29 Jul 16 ✓
★ <b>USCG Airborne Spill Remote Sensing and Reporting.....</b>	<b>Nov 16</b>
Project End.....	Jan 17

**Sponsor:** CG-711  
**Stakeholder(s):** BSEE, CG-MER, ATC Mobile, FORCECOM

<b>Project #:</b> 7609	<b>Expected Benefit:</b> Improved Doctrine/CONOPs/TTPs
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- Notes:**
- CG Sensor Field Evaluation A & B will be joint testing with the Advanced Mission System program to leverage the upgraded capability of the next fixed-wing mission system.
  - BSEE is co-funding this project.
  - Supports the Coast Guard Energy Renaissance Initiative.

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# Research of Tethered Aerial Surveillance and Communication Systems (TASCS) for USCG Operations

Mission Need: Mobile aerial platforms deployable from shore, small boats, and cutters that extend sensor and communication range.

## Project Objectives:

- Research developments in TASCS technology and identify prospective solutions in the market.
- Develop TASCS technology/USCG capability Quality Function Deployments (QFD) and conduct Pugh Concept Scoring.
- Complete deployment/integration studies and develop test cards for cutter, small boat, and land/ice based operations.
- Complete demonstration of representative technologies in cutter, small boat, and land/ice operational scenarios.
- Conduct an RDC technology transition review.
- Provide a comprehensive report on the state of the market, operational utility, and transition readiness of TASCS technology.



## Key Milestone / Deliverable Schedule:

Project Start.....	6 Oct 15
Market Research/Integration Analysis .....	Nov 16
TASCS Demonstration (Cutter).....	Nov 16
TASCS Quality Function Deployments (QFD) .....	Jan 17
TASCS Demonstration (Land/Ice).....	Jan 17
TASCS Demonstration (Small Boat).....	Apr 17
RDC Technology Transition Review.....	Jun 17
★ <b>Operational Utility of TASCS Technology Report .....</b>	<b>Aug 17</b>
Project End.....	Sep 17

★ Indicates RDC product.

**Sponsor:** CG-761

**Stakeholder(s):** CG-711, CG-731, LANT, PAC

<b>Project #:</b> 7610	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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- Notes:**
- Collaboration and technical exchange with DHS Science and Technology Directorate (S&T), Borders and Maritime Division (BMD) – Remote Aircraft for Public Service (RAMPS) Project.
  - Supports the Coast Guard Western Hemisphere Strategy.

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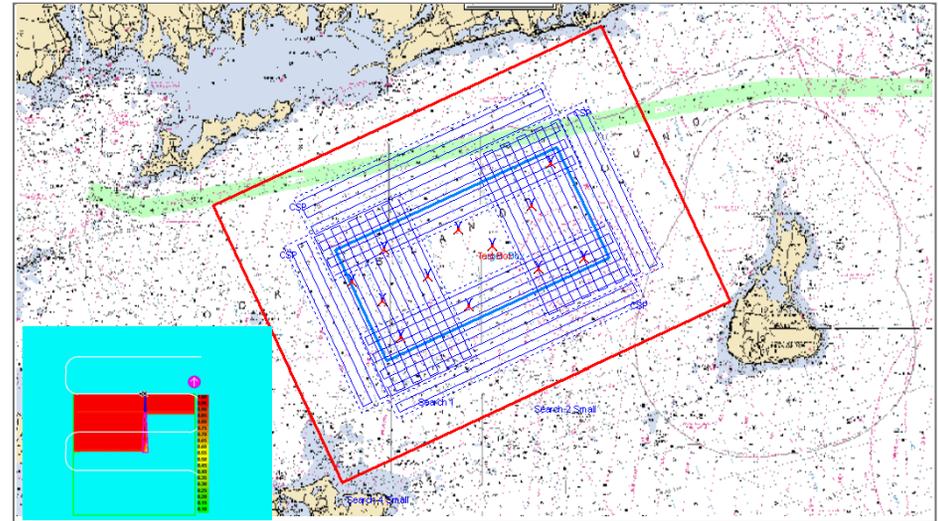


# Evaluation of ESS and NVG LRCs in SAROPS

**Mission Need:** Electro-Optical/Infrared Sensor System (ESS) and Night Vision Goggles (NVG) Lateral Range Curves (LRC) in Search and Rescue Optimal Planning System (SAROPS) require evaluation and refinement.

## Project Objectives:

- Conduct a detailed evaluation of the modified ESS SAR Mode LRCs as recommended by CG-SAR in the “Specifications for Implementing Electro-Optical/Infrared Sensor System (ESS) SAR Mode Lateral Range Curves in SAROPS” document dated Feb. 23, 2016.
- Conduct an evaluation of methods for estimating the algorithms for NVGs to account for improvements in technology.
- Recommend changes to SAROPS that will enable efficient and effective employment of ESS/NVG-equipped assets in SAR missions.



## Key Milestone / Deliverable Schedule:

Project Start.....	20 Oct 15 ✓
Assessment of SAROPS Changes to Refine ESS LRCs .....	Oct 16
Assessment of SAROPS Changes to Refine NVG LRCs.....	Nov 16
★ <b>Recommended SAROPS Improvements to Optimize ESS and NVG.....</b>	<b>Mar 17</b>
Project End.....	Mar 17

**Sponsor:** CG-SAR

**Stakeholder(s):** CG-711

<b>Project #:</b> 7611	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Supports the Coast Guard Western Hemisphere Strategy.

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**Acquisition Directorate**  
**Research & Development Center**

UNCLAS/USCG Research & Development Center  
Internet Release is Authorized

8/17/16  
Version date

# Cockpit Laser Strike Protection

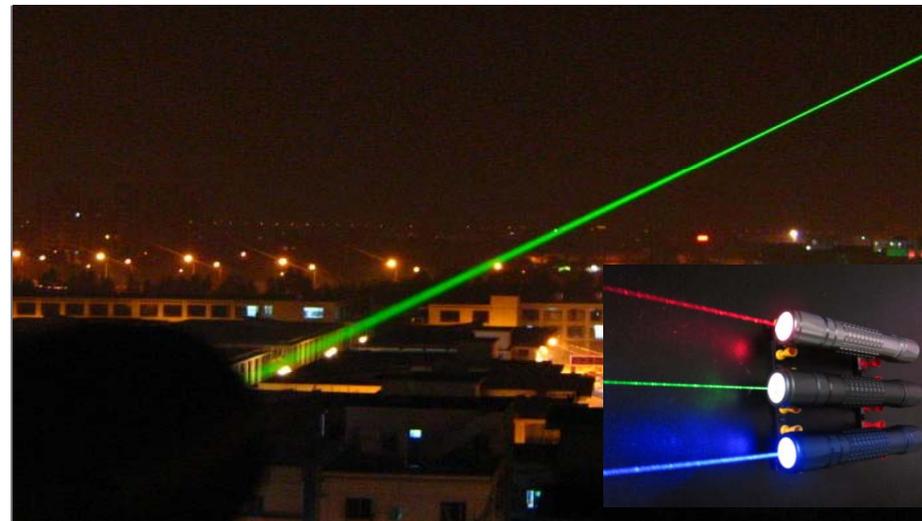
**Mission Need:** A reliable and unburdensome mechanism for protecting CG aviators against laser strike hazards.

## Project Objectives:

- Investigate Government and industry developments in the area of cockpit laser filtering technologies.
- Conduct a USCG airborne asset windshield configuration and coating logistics study.
- Conduct an aviation external indicator wavelength study.
- Develop Cooperative Research and Development Agreement(s) (CRADA) with developers of cockpit laser strike solutions.
- Perform optical performance evaluations in the RDC General Engineering Laboratory Support (GELS) laboratory.
- Perform environmental, adhesion, installation, and logistics related evaluations.
- Analyze results and report on cockpit laser strike protection solutions.

## Key Milestone / Deliverable Schedule:

Project Start.....	1 Oct 14 ✓
CRADA(s) with Technology Developers.....	29 Jul 16 ✓
Optical Performance Evaluation.....	Jul 17
Degradation and Adhesion Evaluations.....	Jul 17
★ <b>Cockpit Laser Strike Filtering Technology.....</b>	<b>Nov 17</b>
Project End.....	Dec 17



**Sponsor:** CG-113

**Stakeholder(s):** CG-711, CG-731, CG-721, CG-41, ALC

<b>Project #:</b> 7755	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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### Notes:

- Supports the Coast Guard Western Hemisphere and Human Capital Strategies.

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# Robotic Aircraft for Maritime Public Safety (RAMPS)

**Mission Need:** Better understanding the risks, benefits and limitations of operating existing Commercial off the Shelf Small Unmanned Aircraft System (sUAS) technology in a maritime environment for cutter forces other than the National Security Cutter.

## Project Objectives:

- Develop requirements, standards and Concept of Operations.
- Leverage Department of Defense and Original Equipment Manufacturer investments in sUAS technology.
- Evaluate realistic maritime security and first responder scenarios.
- Create a knowledge resource database.
- Guide future platform and sensor development to meet maritime first responder requirements.
- Evaluate sUAS technologies in different environmental areas.
- Conduct an assessment for potential demonstration and evaluation facilities with special use air space establishing an Federal Aviation Administration approved Certificate of Waiver or Authorization for Department of Homeland Security (DHS) use.



## Key Milestone / Deliverable Schedule:

Project Start.....	30 Oct 13	✓
RAMPS Request For Information (RFI) Release.....	10 Oct 14	✓
Develop Test Plan and Cards Phase I-A .....	15 Mar 15	✓
RAMPS Course Validation Phase I-A .....	28 Apr 15	✓
RAMPS Phase I-A Demos 01-05 .....	10 Jun 16	✓
★ <b>RAMPS Compilation Report Phase 1A .....</b>	<b>Oct 16</b>	
RAMPS Phase I-B Reissue RFI.....	Oct 16	
★ <b>SUAS Site Evaluation Study Report.....</b>	<b>Nov 16</b>	
RAMPS Phase I-B Demos 01-03 .....	Dec 17	
RAMPS Capabilities Demos 01-03.....	Sep 18	
★ <b>RAMPS Compilation Report Phase 1B .....</b>	<b>Jan 19</b>	
Project End.....	Feb 19	

★ Indicates RDC product.

**Sponsor:** DHS S&T, CG-711  
**Stakeholder(s):** CG-751, CG-761, CG-771, CG-931, JTF-E

<b>Project #:</b> 7807	<b>Expected Benefit:</b> Direct Acquisition Support (MAR, MNS, CONOPS, ORD, AA, LCCE, T&E, etc.)
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- Notes:**
- Partnership with DHS Science and Technology Borders and Maritime Division.
  - Establish Cooperative Research and Development Agreements with industry partners for sUAS demonstrations.
  - Supports the Coast Guard Western Hemisphere Strategy.

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# Advanced sUAS Sensor Investigations

**Mission Need:** Small Unmanned Aircraft System (sUAS) advanced sensors to meet USCG Wide Area Surveillance needs.

## Project Objectives:

- Evaluate current and near term state of the market sensor capabilities using RDC sUAS Final Report Modeling and Simulation supplement as a baseline.
- Obtain and test applicable sensor technologies from shore based test site.
- Conduct analysis of results to determine impact of improved sensor capabilities on USCG mission performance.
- Validate modeled results that NextGen sUAS sensors can significantly increase the target detection capability of National Security Cutter over baseline sUAS sensor configurations tested in 2014.

## Key Milestone / Deliverable Schedule:

Project Start.....	30 Jul 15 ✓
Review NextGen Modeling Results Government Furnished Information.....	12 Oct 15 ✓
Select NextGen Sensors for sUAS Integration.....	9 Nov 15 ✓
Integrate NextGen Sensors on Test Assets.....	10 Aug16 ✓
Evaluate NextGen Sensors on Target Set.....	Sep 16
Analyze Field Test Results.....	Dec 16
★ <b>Advanced sUAS Sensors Investigations Final Report.....</b>	<b>Mar 17</b>
Project End.....	Apr 17



**Sponsor:** CG-711  
**Stakeholder(s):** CG-931, CG-761, FORCECOM, JTF-E, JTF-W, CBP

<b>Project #:</b> 7810	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Supports the Coast Guard Western Hemisphere and Arctic Strategies.

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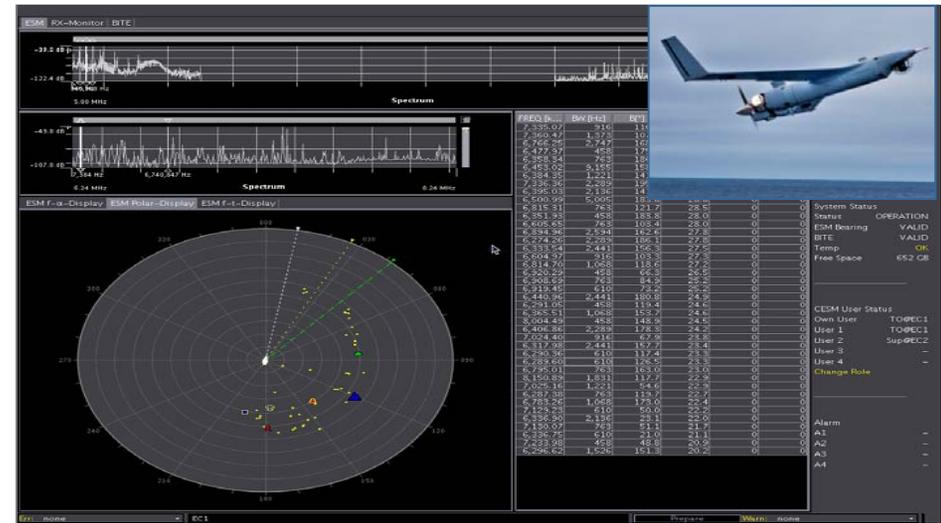


# sUAS Direction Finding (DF) Payloads

**Mission Need:** Small Unmanned Aircraft System (sUAS) advanced sensors to refine USCG Wide Area Surveillance needs and expand Beyond Line-Of-Sight communications/signal exploitation.

## Project Objectives:

- Evaluate the applicability of DF payloads on increasing sUAS capability to self cue to targets of interest.
- Determine market availability of needed capabilities and determine extent that this capability has been employed.
- Obtain capability and conduct field evaluations of technology using USCG mission scenarios.
- Analyze and report results with recommendations for potential employment.



## Key Milestone / Deliverable Schedule:

Project Start.....	6 Oct 15 ✓
Capability Needs for sUAS DF Payloads Kick-off Meeting.....	2 Mar 16 ✓
Navy Warfare Development Command (NWDC) Demonstration and After-action Report.....	Aug 16
NSWC Dahlgren Demonstration and After-action Report.....	Sep 16
NSWC Stiletto Demonstration and After-action Report.....	Sep 16
RDC Cape Cod Demonstration and After-action Report.....	Feb 17
Post-Demonstration Modeling Report.....	Mar 17
★ <b>Final Report: sUAS DF Payloads.....</b>	<b>Apr 17</b>
Project End.....	May 17

**Sponsor:** CG-761

**Stakeholder(s):** CG-711, CG-931, CG-2

<b>Project #:</b> 7811	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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- Notes:**
- The project is to collaborate with Project 7526 VHF Hoax Location and Methods to enhance the effectiveness of the other projects technologies while demonstrating sUAS DF capability.
  - Supports the Coast Guard Western Hemisphere and Arctic Strategies.

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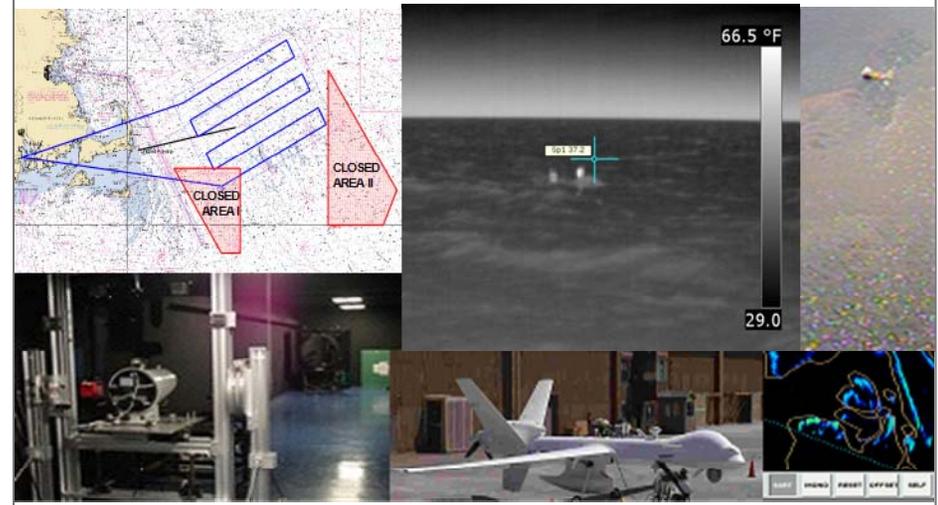
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# Aviation Branch Support

**Mission Need: Maintain RDC Branch competency and knowledge; provide rapid response; and provide external liaison.**

## Project Objectives:

- Maintain/develop Branch technical competencies and infrastructure in CG-relevant aviation/Test and Evaluation technology.
- Support Aviation Strategic Project Portfolio Alignment.
- Report on development & test of Thermal Oscar target.
- Report on analysis of CG airborne spill surveillance.
- Seek opportunities to support CG/Department of Homeland Security aviation programs that close capability gaps and improve mission performance.



## Key Milestone / Deliverable Schedule:

Project Start .....	3 Dec 07 ✓
★ <b>Enhanced Search and Rescue Effectiveness with Unmanned Aerial Vehicle Swarm Search Capabilities.....</b>	<b>27 Apr 15 ✓</b>
FY18-19 Idea Submission Review.....	Nov 16
FY18 Assessment of Prospective Portfolio.....	Feb 17
New Project Execution Plans/Proposals.....	As Required
Conduct Market Research.....	As Required
Technology Conferences.....	As Required
Project End .....	TBD

**Sponsor:** CG-926

**Stakeholder(s):**

<b>Project #:</b> 9992	<b>Expected Benefit:</b> Add to general R&D knowledge base
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Notes:

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★ Indicates RDC product.

# Cell Phone Location for Search and Rescue

**Mission Need: Cell phone technology to support the precise geo-location of distressed mariners in mayday and Search and Rescue (SAR) scenarios.**

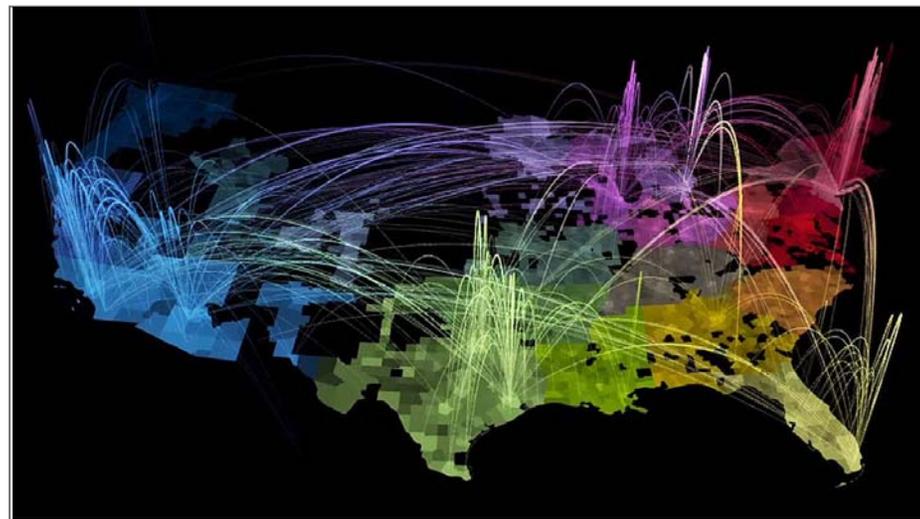
## Project Objectives:

- Conduct market research, identify, and assess state of the market Commercial/Government off the Shelf (COTS/GOTS) geo-locating system(s).
- Inform functional requirements, Tactics, Techniques and Procedures (TTP) and Quick Response Cards (QRC) for cell phone geo-location system and methods.
- Investigate Coast Guard surface, rotary and fixed wing asset ability to locate signals being emitted from distressed mariner cell phones.
- Inform the current SAR TTPs/QRCs of Command Centers and tactically-controlled fixed wing, rotary and surface assets.
- Contribute to current awareness campaign educating mariners to provide cell phone numbers in float plans, place cell phones in waterproof sleeves, and carry onboard solar cell phone chargers to extend mobile battery life.

## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Document Functional Requirements.....	Dec 16
Market Research.....	Mar 17
★ <b>Market Research Briefing.....</b>	<b>May 17</b>
Obtain COTS/GOTS Solutions for Demonstration.....	Aug 17
Demonstration Test Plan.....	Sep 17
Conduct Demonstration.....	Nov 17
★ <b>Cell Phone Tracking for SAR Final Brief and Report.....</b>	<b>Jan 18</b>
Project End.....	Feb 18

★ Indicates RDC product.



**Sponsor:** CG-SAR  
**Stakeholder(s):** LANT, PAC, CG-7, CG-BSX, C4IT SC, FORCECOM

<b>Project #:</b> 2017-8	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/ resiliency
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**Notes:**

- Leverage DHS S&T's Homeland Security Advanced Research Projects Agency (HSARPA) efforts in cell phone tracking technologies.
- Supports the Coast Guard Western Hemisphere and Cyber Strategies.
- Possible use of Cooperative Research and Development Agreements (CRADAs)/Bailment Agreements.

**RDC POC:**  
ENS Gianfranco Palomba

**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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# Cybersecurity Vulnerabilities, Threats, and Risk Mitigation Strategies for Coast Guard Surface and Air Assets

**Mission Need: CG platforms require resistance and resilience to cyber attacks.**

## Project Objectives:

- Conduct cyber security risk research analysis for Global Positioning System (GPS), Automatic Identification System (AIS) and specific mission oriented systems dependent on position navigation and timing.
- Partner with Department of Homeland Security (DHS) Science and Technology (S&T) and Office of Naval Research (ONR) to test specific equipment vulnerabilities and derive the impact and consequence of attacks to identify defense strategies.
- Review USCG platform configurations for computer controlled systems. Using design documentation and ship inspection details, perform cyber assessments of various vessels and aircraft. Partner with ONR Resilient Hull, Mechanical, and Electrical Security (RHIMES), National Labs, and Federally Funded Research and Development Centers (FFRDCs) to develop mitigations.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Inventory and Acquire GPS/AIS Units.....	Dec 16
Conduct GPS/AIS Testing .....	Mar 16
★ <b>GPS/AIS Cyber Assessment Report .....</b>	<b>Oct 17</b>
Inventory Systems for Evaluation.....	Apr 17
Conduct Surface Assessment.....	Jul 17
★ <b>Surface Asset Vulnerability Report.....</b>	<b>Dec 17</b>
Inventory Systems for Evaluation.....	Dec 17
Conduct Aviation Assessment.....	Feb 18
★ <b>Airborne Asset Vulnerability Report.....</b>	<b>May 18</b>
Project End.....	Sep 20

★ Indicates RDC product.

**Sponsor:** CG-761  
**Stakeholder(s):** CYBERCOM, CG-2, CG-65, CG-7, C4IT SC, DHS S&T, LANT, PAC, CG-93

**Project #:** 2017-14  
**Expected Benefit:** Direct Product Line/Core Technology Support (Tech refresh, DMS, etc)

- Notes:**
- Partner with DHS S&T First Responders Group, Cyber Security Division, ONR RHIMES program.
  - Leverage internal R&D efforts at MITRE FFRDC.
  - Collaborate with Oak Ridge/Pacific National Labs, Johns Hopkins Applied Physics Lab and U.S. Merchant Marine Academy.
  - Supports the Coast Guard Cyber Strategy.

**RDC POC:**  
Mr. Jay Spalding

**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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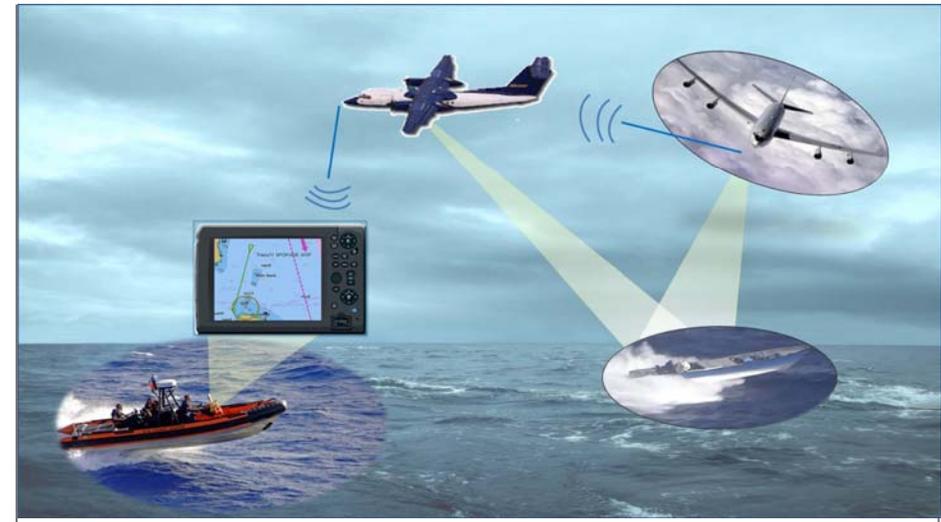


# Vectoring Over the Horizon-Cutter Boat (OTH-CB) for Non Compliant Vessel (NCV) Intercept

**Mission Need:** Ability to vector the Over the Horizon-Cutter Boat (OTH-CB) to intercept Non Compliant Vessels (NVC).

## Project Objectives:

- Evaluate technical solutions to help vector surface assets to targets of interest.
- Identify the OTH-CB system weaknesses in the NCV Intercept chain.
- Develop inputs to Tactics, Techniques, and Procedures (TTP) to standardize vectoring CG vessels and in particular, OTH-CBs.



## Key Milestone / Deliverable Schedule:

Project Start.....	5 Oct 15 ✓
Determine Gaps and Capabilities .....	12 Feb 16 ✓
★ <b>Alternative Recommendations Brief.....</b>	<b>11 Mar 16 ✓</b>
Develop Alternative Solution Prototype.....	Jul 17
Conduct Field Test/Demonstration of Alternative Solution.....	Jul 17
★ <b>Results of OTH-CB Vectoring Alternative Evaluation &amp; TTP Recommendations.....</b>	<b>Sep 17</b>
Project End.....	Oct 17

★ Indicates RDC product.

**Sponsor:** CG-751  
**Stakeholder(s):** CG-711, CG -731, CG-741, CG-761, CG-MLE, LANT, PAC, FORCECOM, D7, CBP

<b>Project #:</b> 5711	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Leverage RDC Projects:
  - Automatic Transport of Search and Rescue Patterns.
  - Tactical Communications to Enhance Coast Guard Operations.
- Supports the Coast Guard Western Hemisphere Strategy and the Department of Homeland Security Southern Border and Approaches Campaign Plan.

**RDC POC:**  
Mr. Sean Lester

**CG-926 Domain Lead:**  
LT Steve Hager

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# Tactical Communications to Enhance Coast Guard Operations

**Mission Need:** Rapidly communicate voice and data among Sector and Cutter Forces; access databases and share data between surface assets, boarding and inspection teams, and command centers.

## Project Objectives:

- Review and assess the current state of commercial and government communications technologies suitable for Sector and Cutter Forces (including surface assets, boarding & facility inspection teams, and command centers) to securely share imagery, text, email, documents, and other operational data.
- Review & assess information sharing technologies to:
  - Upload/complete/submit routine boarding documents; and
  - Access law enforcement databases (vessels & people).
- Design a preliminary concept and scalable network architecture (offshore Cutter boarding team network (TCN-BT), and Sector Forces Protected Tactical Communications Network (SFTacNet)).
- Conduct preliminary demonstration of select technologies; report findings.



## Key Milestone / Deliverable Schedule:

Project Start.....	19 Nov 13	✓
Task Segment 1 Start – TCN-BT Architecture.....	19 Nov 13	✓
★ <b>Integrated TCN–BT Architecture Briefing.....</b>	<b>1 Dec 14</b>	✓
★ <b>TCN-BT Final Report.....</b>	<b>24 Sep 15</b>	✓
Task Segment 2 Start – SFTacNet Architecture.....	20 Oct 15	✓
Explore FirstNet Partnership.....	29 Jan 16	✓
Evaluate/Approve Cooperative Research Development Agreement(s) (CRADA).....	14 Mar 16	✓
SFTacNet Architecture Design.....	29 Apr 16	✓
Interim Authorization to Test/Interim Approval to Connect/Tower Collocation/Time Compliance Technical Orders Approvals.....	Aug 16	
Technical Demonstration Plan .....	Aug 16	
Technical Demonstration .....	Feb 17	
★ <b>SFTacNet Annotated Briefing &amp; Transition Assessment.....</b>	<b>Jun 17</b>	
Project End.....	Jul 17	

★ Indicates RDC product.

**Sponsor:** CG-761  
**Stakeholder(s):** CG-255, CG-642, CG-721, CG-731, CG-741, CG-751, C3CEN, AREA-6

<b>Project #:</b> 5804	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/ resiliency
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**Notes:**

- **Related projects:** Boarding Team Comms Phase I ; Secure Tactical Connectivity; Mobile Technology for Operational Efficiency.
- **Partners:** NAVSEA Dahlgren; JSOC; DTRA; FirstNet Program Office; DHS S&T; DISA; Industry Tech Reps (CRADA(s)); CBP OA&M; FL FWC.
- Supports the Coast Guard Western Hemisphere Strategy.

**RDC POC:**  
Mr. Wayne Buchanan

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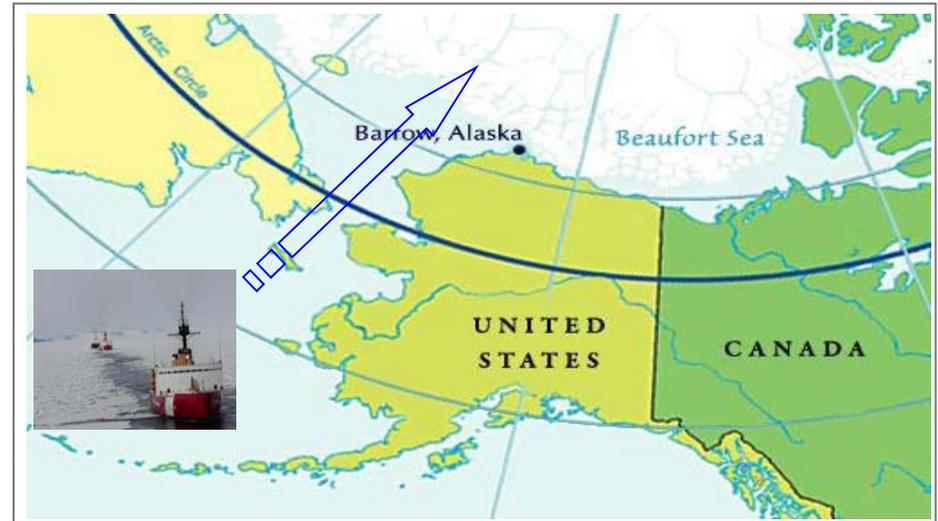


# Arctic Communications Technology Assessments

**Mission Need:** With anticipated increases in shipping traffic through the Arctic Region, increased communications to improve mission performance must be assessed.

## Project Objectives:

- Survey, evaluate, and document the capabilities of existing CG and non-CG maritime Arctic communications technologies.
- Assess emergency communications capabilities in the Arctic for mariners.
- Develop and demonstrate the feasibility of connecting shipboard mobile Automatic Identification System (AIS) transponders on Class A vessels to existing Iridium satellite links, to include an initial system architecture for extended ranges.
- Observe High Frequency (HF) and satellite coverage in the Arctic Region and compare with modeled coverage.
- Assess Mobile User Objective System satellite system for CG high bandwidth data communications.
- Investigate use of National Incident Command System (NICS) in the Arctic.



## Key Milestone / Deliverable Schedule:

Project Start.....	1 Oct 12 ✓
★ Arctic Coverage and Average Expected Coverage.....	16 Aug 13 ✓
★ Modeling of Emergency Frequencies in the Arctic.....	23 Dec 13 ✓
★ As-Is vs. Alternative System Performance.....	7 Mar 14 ✓
★ State of Arctic HF Comms 2014 vs. Modeled Predictions.....	15 Dec 14 ✓
★ Feasibility of an Iridium/Automatic Identification System (AIS) Shipboard System.....	29 Jun 15 ✓
★ Assessment of Technology Deployed to Provide Arctic Communications 2015.....	22 Feb 16 ✓
★ Commercial & National Asset Satellite Survey Report.....	Aug 16
★ Summary Report NICS Use in the Arctic .....	Feb 17
★ Arctic Communications Technology Recommendations and Path Forward.....	Apr 17
Project End.....	May 17

★ Indicates RDC product.

**Sponsor:** CG-761  
**Stakeholder(s):** CG-6, C3CEN, DHS S&T, R21, Alaska Marine Ex, PAC, D17, CG-5PW

<b>Project #:</b> 6208	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Execution in conjunction with RDC Arctic Operations Support.
- Project will collaborate with and utilize funding from Department of Homeland Security Science and Technology Office of University Programs.
- Supports the Coast Guard Arctic Strategy.

<b>RDC POC:</b> LCDR Samuel Nassar	<b>CG-926 Domain Lead:</b> Ms. Holly Wendelin
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# Mobile, Modular, Maritime Domain Awareness (M3DA)

**Mission Need:** A mission-linked catalog of existing and potential Maritime Domain Awareness (MDA) sensors for the future fielding of an optimum mobile modular MDA system to support cross-agency operations.

## Project Objectives:

- Determine applicability of agency/industry/interagency sensors (land based, surface and airborne) and communications systems that meet defined mission needs.
- Categorize the taxonomy and the capabilities and limitations of sensors, communication systems and platforms utilized for multi-mission, multiagency assets to establish full mission capability based on a regional approach.



## Key Milestone / Deliverable Schedule:

Project Start .....	30 Apr 15 ✓
S&T Awards Contract.....	1 Jun 15 ✓
End Series of Discovery Meetings .....	Sep 16
Collective MDA Workshop.....	Oct 16
★ <b>Capabilities and Limitations Taxonomy.....</b>	<b>Mar 17</b>
Interagency Unit Discussion .....	Apr 17
★ <b>Summary Report and Brief.....</b>	<b>May 17</b>
Project End.....	Jul 17

★ Indicates RDC product.

**Sponsor:** DHS S&T  
**Stakeholder(s):** D7, D8, CG-761, CG-65, LANT, C4IT SC, JTF-E, JIATFS

<b>Project #:</b> 7203	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Related RDC Projects:
  - Mobile Technology for Operational Efficiency,
  - Mobile Asset Tracking and Reporting During an IONS,
  - Develop Innovative Counter Drug (CD) Interdiction Patrol Tactics,
  - Tactical Comms Network (TCN) to Enhance Boarding Operations,
  - Robotic Aircraft for Maritime Public Safety (RAMPS).
- Supports the Coast Guard Western Hemisphere Strategy.

**RDC POC:**  
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**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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# Hoax Location Systems and Methods

**Mission Need:** Systems and methods to support precise geo-locating of possible hoax calls as well as providing data to aid investigations, evidence development and follow-on prosecution.

## Project Objectives:

- Conduct market research, identify, and assess state of the market Commercial/Government Off the Shelf (COTS/GOTS) geo-locating system(s).
- Investigate Social Media aspects of hoax calling/investigation to verify and validate behaviors and data collection.
- Inform functional requirements; methods; and Tactics, Techniques, and Procedures (TTP) for hoax location systems and methods.
- Provide input to Coast Guard Investigative Service case investigations.



## Key Milestone / Deliverable Schedule:

Project Start .....	21 Oct 14 ✓
Document Functional Requirements.....	28 Nov 14 ✓
Market Research.....	30 Sep 15 ✓
★ <b>Market Research Briefing.....</b>	<b>6 Nov 15 ✓</b>
Obtain all COTS Equipment for Test Plan.....	25 Apr 16 ✓
Carry out Limited User Evaluation.....	29 Jul 16 ✓
Stiletto Direction-Finding Demonstration.....	Sep 16
★ <b>Hoax Location Systems &amp; Methods Final Brief &amp; Report.....</b>	<b>Mar 17</b>
Project End.....	Apr 17

**Sponsor:** CG- MLE  
**Stakeholder(s):** CGIS, CG-257, CG-SAR, LANT/PAC-6, CG-761, C4IT-SC, CGA-EE, CG-MER

<b>Project #:</b> 7526	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/ resiliency
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**Notes:**

- Supports the Coast Guard Western Hemisphere Strategy.
- Collaborate with Department of Homeland Security Science and Technology Office of University Programs and other universities researching social media and voice forensics.

**RDC POC:**  
ENS Gianfranco Palomba

**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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★ Indicates RDC product.

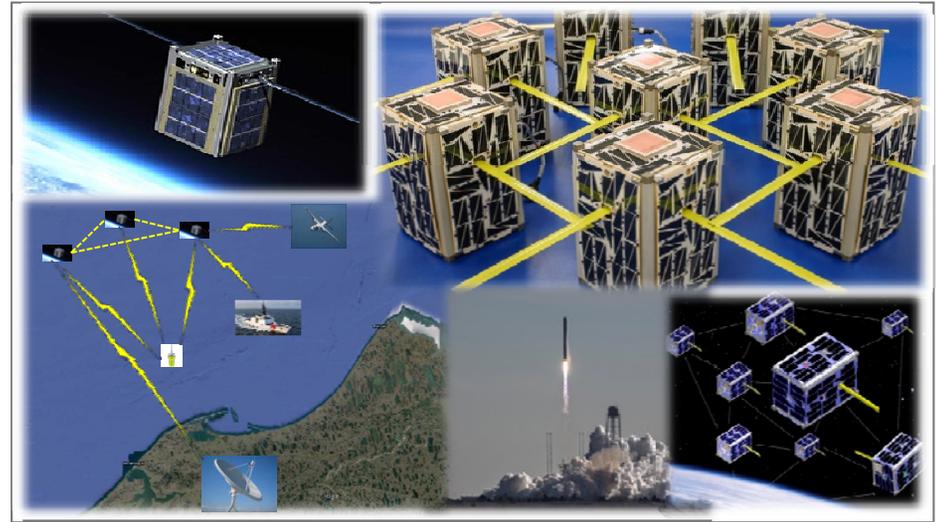


# Evaluation of Potential CG Use of CubeSats

**Mission Need:** Investigation and assessment of the operational utility of CubeSat technology for CG missions.

## Project Objectives:

- Inform CubeSat Concept of Operations (CONOPs) scenarios that would support CG mission needs and influence CubeSat requirements.
- Build and deploy two ground stations for the CubeSat Command and Control (MC3) ground network.
- Participate/partner/develop test plans/metrics for CubeSat technology evaluation(s), test and document the performance of the MC3 ground stations during On-orbit test and evaluation.
- Develop a CubeSat technology roadmap to support the most pressing CG mission needs, including development, deployment and Operations and Maintenance (O&M) planning factors.



## Key Milestone / Deliverable Schedule:

Project Start.....	29 Jun 16 ✓
Partner Collaboration/IPT Establishment.....	Oct 16
Deploy MC3 Ground Station #1 .....	Jun 17
Deploy MC3 Ground Station #2 .....	Oct 17
Technology Evaluation(s) .....	Dec 17
★ <b>Performance Test Results of Two MC3 Ground Stations.....</b>	<b>Feb 18</b>
★ <b>CG CubeSat Technology Roadmap Report and Brief.....</b>	<b>Aug 18</b>
Project End.....	Sep 18

**Sponsor:** CG-257

**Stakeholder(s):** DHS S&T (BMD), CG-2/6/SAR/MLE, C4IT SC, CGA

<b>Project #:</b> 7759	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Partner with DHS S&T Borders and Maritime Div., National Reconnaissance Office Mission Integration Dir. CubeSat, and U.S. Air Force Operationally Responsive Space.
- Collaborate with Program Executive Office Space Systems/DoD J39.
- Leverage In-Q-Tel Cosmiq Works Lab.
- Link to RDC Arctic Communications Project 6208.
- Supports the Coast Guard Western Hemisphere and Arctic Strategies.

**RDC POC:**  
LCDR Sam Nassar

**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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★ Indicates RDC product.

# Mobile Asset Tracking and Reporting During an IONS

**Mission Need:** A flexible ad hoc interoperable communication/information system to enhance the Coast Guard's ability to respond to Incidents of National Significance (IONS).

## Project Objectives:

- Prototype a flexible interoperable communication/information system, processes, and procedures to enhance the CG's ability to transfer information that will assist personnel responding to an IONS (e.g., oil spill). The system, processes, and procedures should make use of the equipment the responders are expected to bring to the incident such as smart phones, tablet computers, and laptops.



## Key Milestone / Deliverable Schedule:

Project Start.....	9 Aug 11 ✓
★ <b>Technical Assessment Brief for Mobile Asset Tracking and Reporting Device.....</b>	<b>9 May 13 ✓</b>
★ <b>Technical Assessment Brief: System Integration with Commercial Off The Shelf (COTS) Incident Action Plan (IAP) Software .....</b>	<b>27 Oct 14 ✓</b>
★ <b>Mobile Asset Tracking and Reporting Device: IONS System Test Results and Recommendations (Report).....</b>	<b>10 Dec 14 ✓</b>
Technology Demonstrations.....	Aug 16
Conversion of National Instant Criminal Background Check System (NICS) 5 to NICS 6.....	Oct 16
Installation of NICS in Homeland Security Information Network ...	Feb 17
★ <b>Brief: Mobile Asset Tracking and Reporting Device: Project Summary Brief and Press Release.....</b>	<b>Mar 17</b>
Project End.....	Mar 17

★ Indicates RDC product.

**Sponsor:** CG-761  
**Stakeholder(s):** CG-CPE, DHS S&T, USCG-IMAT, CG-633, CG-MER

<b>Project #:</b> 8105	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Includes funding from FY11 Oil Spill Research Earmark.
- Project includes use of a Cooperative Research and Development Agreement (CRADA).
- Project includes Interagency Agreement (IAA) with DHS S&T/MIT Lincoln Labs.
- Supports the Coast Guard Western Hemisphere and Arctic Strategies.

**RDC POC:**  
Mr. Jon Turban, P.E.

**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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# Automatic Transport of SAR Patterns

**Mission Need: Near real-time Search and Rescue (SAR) patterns for forward assets to effectively execute mission.**

## Project Objectives:

- Demonstrate and evaluate the near real-time transport of SAR patterns to forward assets.
- Define required capabilities for deployment/transition.
- Provide system architecture(s), system dataflow diagram(s), and Concept of Operation documentation necessary for deployment/transition of the system.
- Inform planned enterprise transmit solution being coordinated by CG-761.



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## Key Milestone / Deliverable Schedule:

Project Start.....	12 Nov 14 ✓
Auxiliary Search and Rescue (AUXSAR) Test.....	10 Sep 15 ✓
★ <b>Sponsor Brief AUXSAR Test .....</b>	<b>26 Oct 15 ✓</b>
Cutter Test.....	1 Apr 16 ✓
★ <b>Sponsor Brief Cutter Test .....</b>	<b>26 May 16 ✓</b>
Test through Enterprise Service Bus using Nationwide Automatic Identification System Transmit Services.....	Nov 16
★ <b>Final Summary Report .....</b>	<b>Jan 17</b>
Project End.....	Feb 17

**Sponsor:** CG-761

**Stakeholder(s):** CG-711, CG-731, CG-751, C3CEN, CG-SAR, CG-5P

<b>Project #:</b> 8113	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Response Boat testing removed from project plan due to SINS II Acquisition – future replacement includes required Secure-but-unclassified Tactical Encrypted Data System (STEDS) protocol requirements.
- Supports the Coast Guard Western Hemisphere and Arctic Strategies.

**RDC POC:**  
Mr. Sean Lester

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Ms. Holly Wendelin

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# Mobile Technology for Operational Efficiency

**Mission Need:** Enhance field operations by using mobile technology to capture and access operational data.

## Project Objectives:

- Prototype a flexible communications/information system with processes, and procedures to enhance the CG's ability to transfer information that will assist personnel during field operations.
- Develop processes/procedures to ensure tie-in and compliance with CG Program of Record/System Architecture/System Development Life Cycle (SDLC).



## Key Milestone / Deliverable Schedule:

Project Start.....	6 Mar 15 ✓
Prototype System.....	Feb 17
Technology Demonstration.....	Nov 17
★ <b>Mobile Technology for Operational Efficiency: System Test Results and Recommendations.....</b>	<b>Mar 18</b>
Project End.....	May 18

**Sponsor:** CG-761  
**Stakeholder(s):** CG-1B3, LANT/PAC-6, CG-6, C4IT-SC, OSC, TISCOM

<b>Project #:</b> 8114	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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- Notes:**
- Leverage current projects:
    - Mobile Asset Tracking and Reporting During an IONS.
    - PROTECT/TRUST and other Deterrence Models.
  - Leverage past PDA efforts.
  - Supports the Coast Guard Western Hemisphere Strategy.

**RDC POC:**  
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Ms. Holly Wendelin

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# C4ISR Branch Support

**Mission Need: Maintenance of RDC Branch competency and knowledge; provide rapid response; and provide external liaison.**

## Project Objectives:

- Maintain RDC competency in understanding present and future CG mission performance gaps relating to Command, Control, Computers, Communications, Intelligence, Surveillance and Reconnaissance (C4ISR).
- Maintain RDC competency in technologies that currently or potentially could be used to eliminate or reduce mission performance gaps across multiple CG offices/missions.



## Key Milestone / Deliverable Schedule:

Project Start.....	3 Dec 07 ✓
FY18-19 Idea Submission Review.....	Nov 16
FY18 Assessment of Prospective Portfolio.....	Feb 17
New Project Execution Plans/Proposals.....	As Required
Conduct Market Research.....	As Required
Technology Interchange.....	As Required
Project End.....	TBD

**Sponsor:** CG-926

**Stakeholder(s):**

<b>Project #:</b> 9991	<b>Expected Benefit:</b> Add to general R&D knowledge base
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**Notes:**

**RDC POC:**  
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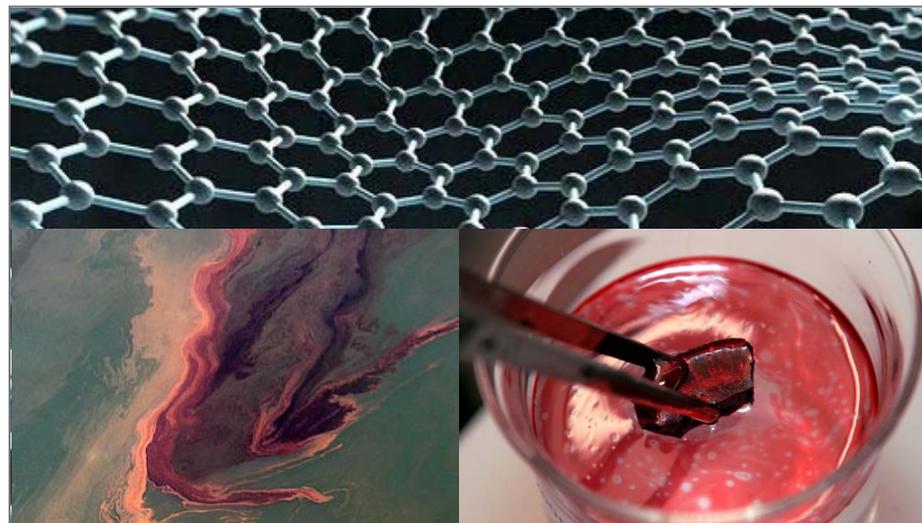
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# Oil Spill Response Emerging Technology Research

**Mission Need:** Guidance for CG Federal On-Scene Coordinators (FOSC) on emerging oil spill response technologies for future spill responses.

## Project Objectives:

- Research to provide the Office of Marine Environmental Response Policy (CG-MER) comprehensive research and evaluation of emerging spill response technologies that may not yet be commercially available.
- Develop a reference guide that will inform the FOSC of emerging technologies with a minimum Technology Readiness Level (TRL) of 7 that may allow quicker and more efficient response through the use of best available technologies in a variety of environments.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Market Research.....	Aug 17
KDP: Evaluate and Select 8–10 Technologies.....	Aug 17
Research Each Selected Technology.....	May 18
KDP: RDC Subject Matter Expert Meeting.....	Jun 18
★ <b>New Technology Reference Guide .....</b>	<b>Dec 18</b>
Project End.....	Jan 19

**Sponsor:** CG-MER

**Stakeholder(s):** ICCOPR

<b>Project #:</b> 2017-12	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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### Notes:

- Supports the Coast Guard Energy Renaissance Initiative.
- Leverage partnerships with University and National Labs regarding state of technology development.

**RDC POC:**  
Mr. Alexander Balsley

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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★ Indicates RDC product.



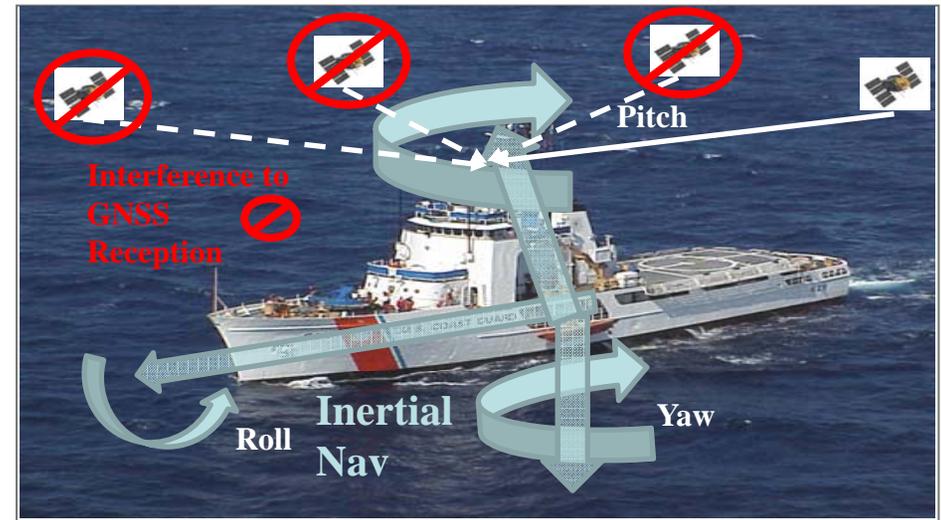
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# Assessment and Technology Demonstration of Inertial Navigation System (INS) Technology

**Mission Need: Reduce reliance on sole means of navigation and harden navigation capabilities to withstand unintentional and intentional outages or hacking of GNSS based navigation.**

## Project Objectives:

- Identify, evaluate, and demonstrate inertial navigation system technologies that can mitigate the impact losses of Global Navigation Satellite System (GNSS) service on the navigational process.
- Determine existing products available through market research.
- Determine state of technology advancements on near-term and long-term future capabilities.
- Test and evaluate selected INS technologies to validate interoperability issues.
- Install and perform demonstrations of selected INS technologies on one more USCG vessels.
- Proactively stimulate further technology development through development of new INS technology standards.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Identify/Determine Coast Guard Capability Gaps.....	Apr 17
Conduct Market Research.....	Aug 17
KDP - Determine Need for Proactive Technology Advancement...Aug 17	
★ <b>Market Research, Capability Gaps, and Integration Issues.....</b>	<b>Sep 17</b>
KDP: Project Continuance for Testing and Demonstration.....	Oct 17
Technology Demonstration.....	Aug 18
★ <b>Technology Demonstration Report.....</b>	<b>Sep 18</b>
★ <b>Status of FY18 Standards Activities for INS Advancement....</b>	<b>Sep 18</b>
Facilitating Industry Adoption of New Technologies.....	Aug 19
★ <b>Status of FY19 Standards Activities for INS Advancement....</b>	<b>Sep 19</b>
★ <b>Inertial Navigation System (INS) Recommendations.....</b>	<b>Sep 19</b>
Project End.....	Oct 19

★ Indicates RDC product.

**Sponsor:**

CG-5PW, CG-NAV

**Stakeholder(s):**

CG-761, CG-751, CG-731, CYBERCOM

**Project #:**

2017-13

**Expected Benefit:**

Improve operational performance/efficiency/mission execution/resiliency & Influence international standards

**Notes:**

- Supports the Coast Guard Cyber Strategy.
- Leverage Office of Naval Research, national labs, academia, and international/national standards communities.

**RDC POC:**  
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# Nearshore and Inland Evaluation of the Estimated Recovery System Potential (ERSP) Calculator

**Mission Need:** An Estimated Recovery System Potential (ERSP) calculator to include response systems for the entire nearshore and inland operating environment.

## Project Objectives:

- Analyze the ERSP calculator and user guide.
- Assess ERSP and determine if it efficiently rectifies the effective daily recovery capacity challenges experienced during Deepwater Horizon (DWH) and determine if the current calculator has had a positive impact in the offshore oil spill response industry.
- Assess if ERSP can be expanded to include the entire near shore and inland operating environment.
- Upon a positive endorsement, expand ERSP to include near shore and inland operating environments.
- Conduct a peer review (National Academy of Sciences and/or Oil Spill response subject matter experts).
- Update the ERSP user guide.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Feasibility Workshop.....	Apr 17
★ <b>ERSP Nearshore and Inland Preliminary Assessment Report</b> .....	May 17
Determine feasibility to enhance current Calculator tool.....	May 17
★ <b>ERSP Nearshore and Inland Assessment Report.....</b>	<b>Apr 18</b>
ERSP Software Enhancement Decision Point.....	May 18
★ <b>Enhanced ERSP Final Report and Calculator.....</b>	<b>Mar 19</b>
National Academy of Sciences & BSEE Review.....	Aug 19
★ <b>Updated ERSP User Guide.....</b>	<b>Aug 19</b>
Project End.....	Sep 19

★ Indicates RDC product.

**Sponsor:** CG-MER

**Stakeholder(s):**

<b>Project #:</b> 2017-26	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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### Notes:

- Partner with Bureau of Safety of Environmental Enforcement (BSEE).

**RDC POC:**  
Mr. Scott Fields

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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



# Develop an Environmentally Friendly Buoy Mooring System

**Mission Need:** A buoy mooring system for environmentally sensitive areas that would avoid directly damaging nearby delicate plants and animals in the benthic zone.

## Project Objectives:

- Conduct a market research to determine alternatives to traditional buoy mooring systems.
- Develop and test prototypes to determine best buoy mooring technology for environmentally sensitive areas.



## Key Milestone / Deliverable Schedule:

Project Start .....	10 Nov 14 ✓
Conduct Market Research.....	25 Feb 15 ✓
Brief Market Research Results to Sponsor.....	31 Mar 15 ✓
KDP: Broad Area Announcement or Prize Competition.....	14 Oct 15 ✓
KDP: Prototype Development.....	2 Jun 16 ✓
KDP: Smart Technology.....	Mar 17
Prototype Testing.....	Apr 17
★ <b>Prototype Development Report.....</b>	<b>Jun 17</b>
★ <b>Environmentally Friendly Buoy Mooring System Prototype Final Report.....</b>	<b>Oct 18</b>
Project End .....	Nov 18

**Sponsor:** CG-NAV

**Stakeholder(s):** LANT, PAC, CG-AtoN/MER

<b>Project #:</b> 2702	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Supports Coral Reef Protection Executive Order 13089.
- Will leverage the academic community.

**RDC POC:**  
Ms. Danielle Elam

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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

★ Indicates RDC product.



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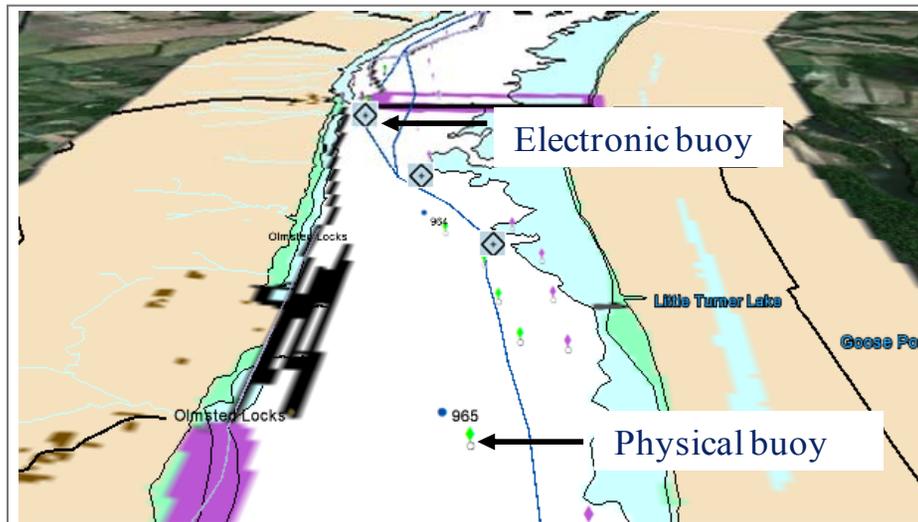
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# Western Rivers e-AtoN Technology Demonstration

**Mission Need:** Demonstrate benefits and demands posed by e-Nav technology to inform maritime security, safety, and mobility requirements in the Western Rivers.

## Project Objectives:

- Provide the Coast Guard and Army Corps of Engineers (USACE) and other partners with experience in distributing navigation information to users via the Automatic Identification System (AIS).
- Inform Coast Guard implementation plan to successfully operate the e-Nav system: agreements, policy changes, necessary infrastructure, the level of effort needed to operate, and the user acceptance challenges.
- Transition the capability for automated message transmission (e.g., NOAA National Weather Service Meteorological Aviation Report, U.S. Geological Survey Water Levels, Ohio River Forecast Center Currents) to USACE for operational deployment throughout Inland Rivers.



## Key Milestone / Deliverable Schedule:

Project Start.....	20 Nov 13 ✓
<u>Phase 1</u>	
Preliminary Protocol Scope.....	28 Apr 14 ✓
Draft Demo Protocols Submitted for FY15 Project Planning....	6 Oct 14 ✓
KDP: Phase II Joint Capability Technology Demonstration	
Execution (funding decision).....	8 Oct 14 ✓
★ <b>Western Rivers Electronic Aids to Navigation (e-AtoN) Technology Demonstration Test Plan .....</b>	<b>7 Jan 15 ✓</b>
<u>Phase 2</u>	
Federal Register Notice for Charting System Manufacturers....	1 Jan 15 ✓
RDC Test Bed Established.....	29 Jun 15 ✓
Transition Automated Message Transmission Capability.....	Apr 17
Western Rivers Demonstration.....	May 17
★ <b>Western Rivers Electronic Aids to Navigation (e-AtoN) Technology Demonstration.....</b>	<b>Jun 17</b>
Project End .....	Jun 17

★ Indicates RDC product.

<b>Sponsor:</b> CG-NAV	
<b>Stakeholder(s):</b> USACE, CG-761, CG-5PW, C4IT, NAVCEN	
<b>Project #:</b> 2722	<b>Expected Benefit:</b> Improved Doctrine/CONOPs/TTPs
<b>Notes:</b>	
<ul style="list-style-type: none"> <li>• Cooperative Research and Development Agreement(s) established with charting system manufacturers to place updated systems on board vessels participating in the test.</li> </ul>	
<b>RDC POC:</b> Mr. Scott Fields	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
<i>For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil</i>	

# Response to Oil In Ice

**Mission Need:** A group of methodologies to minimize the damage to the environment caused by spilled oil in extreme cold regions of the Arctic and Northern U.S.

## Project Objectives:

- Develop equipment and techniques that can be used successfully to detect, track and recover oil in ice filled waters in all conditions.
- Test operational deployments of equipment by conducting a series of demonstrations in the Great Lakes and the Arctic of increasing complexity.
- Evaluate state of the art for response by supporting National Academy of Science (NAS) Arctic Response Assessment.



## Key Milestone / Deliverable Schedule:

Project Start.....	2 Nov 09 ✓
Great Lakes Demonstration 3.....	22 Feb 13 ✓
★ <b>Final Great Lakes Demonstration 3 Report.....</b>	<b>14 Jun 13 ✓</b>
★ <b>Review Recommendations from NAS Report.....</b>	<b>25 Jul 14 ✓</b>
★ <b>Arctic Shield 2014 Demonstration Report.....</b>	<b>16 Mar 15 ✓</b>
Decision Milestone: Follow-on Work and Demonstration 4.....	26 Feb 15 ✓
Oil-in-Ice Demonstration 4 .....	Aug 16
★ <b>Oil in Ice Demonstration 4 Final Report .....</b>	<b>Jan 17</b>
★ <b>Final Report and Input for FOOSC Guide.....</b>	<b>Apr 17</b>
Project End.....	May 17

**Sponsor:** CG-MER

**Stakeholder(s):** D9, D17, BSEE, USEPA, LANT, PAC-7

<b>Project #:</b> 4701	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Partnering with Great Lakes Restoration Initiative (GLRI).
- Supports the Coast Guard Energy Renaissance Initiative.

**RDC POC:**  
Mr. Kurt Hansen

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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# Detection and Mitigation of Oil within the Water Column

**Mission Need:** Accurately detect and mitigate subsurface oil within the water column to 10,000 feet.

## Project Objectives:

- Develop new spill response technologies that detect and mitigate oil within the water column down to 10,000 ft.
  - Operate in all environmental conditions.
  - Locate and mark subsurface oil for possible removal.
  - High resolution for detecting small droplets of oil.
- Technology to be capable of operating off vessels of opportunity.
- Addresses near shore and rivers.



## Key Milestone / Deliverable Schedule:

Project Start.....	3 Aug 11 ✓
Start Design Phase.....	2 Apr 12 ✓
★ <b>Detection of Oil in Water Column, Final Report: Sensor Design.....</b>	<b>5 Mar 13 ✓</b>
★ <b>Detection of Oil in Water Column, Final Report: Detection Prototype Tests .....</b>	<b>29 Jul 14 ✓</b>
Start Mitigation Concept Development .....	23 Jun 15 ✓
★ <b>Mitigation of Oil in Water Column, Final Report: Concept Development.....</b>	<b>2 Jun 16 ✓</b>
Mitigation Prototype testing (Ohmsett).....	Dec 16
★ <b>Mitigation of Oil in Water Column, Final Report: Mitigation Prototype Tests.....</b>	<b>May 17</b>
Project End.....	Jul 17

★ Indicates RDC product.

**Sponsor:** CG-MER, BSEE

**Stakeholder(s):** ICCOPR

<b>Project #:</b> 4702	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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### Notes:

- The project includes funding from a FY11 Oil Spill Research earmark.
- Partnering with Bureau of Safety and Environmental Enforcement (BSEE).

<b>RDC POC:</b> Mr. Alexander Balsley	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
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*For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil*

# Improved In-Situ Burning (ISB) for Offshore Use

**Mission Need:** Better decision-making and operational tools for using ISB as a response option.

## Project Objectives:

- Identify capability gaps that industry is not addressing.
- Determine best practices for operational use of ISB.
- Develop new equipment, such as igniters or fire boom, and procedures to support ISB.
- Perform short-term and long-term enhancements of Little Sand Island (LSI) and the burn pan.
- Annually collect and publish burn results for use by academia, national labs, and international stakeholders.



## Key Milestone / Deliverable Schedule:

Project Start .....	10 Feb 14 ✓
★ <b>ISB Gaps Analysis</b> .....	<b>19 Feb 15 ✓</b>
★ <b>Initial Burn Pan Testing Results</b> .....	<b>4 Mar 16 ✓</b>
KDP on Project Path Forward .....	17 Jun 16 ✓
LSI Short-Term Enhancement.....	Sep 16
Pacific Northwest National Lab (PNNL) Testing at LSI.....	Oct 16
Worcester Polytechnic Institute Testing (WPI) at LSI .....	Mar 17
LSI Long-Term Enhancement.....	Aug 17
BSEE Burn Projects Initialized (6 Potential).....	Oct 16
★ <b>JMTF Summary Burn Report FY17</b> .....	<b>Sep 17</b>
★ <b>JMTF Summary Burn Report FY18</b> .....	<b>Sep 18</b>
★ <b>JMTF Summary Burn Report FY19</b> .....	<b>Sep 19</b>
Project End.....	Sep 19

★ Indicates RDC product.

**Sponsor:** BSEE, CG-MER  
**Stakeholder(s):** NOAA, LANT, PAC

<b>Project #:</b> 4704	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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- Notes:**
- Joint funding with the Bureau of Safety and Environmental Enforcement (BSEE).
  - Partner with academia and national labs to ensure result visibility and access.
  - Supports the Coast Guard Energy Renaissance Initiative.

<b>RDC POC:</b> Mr. Kurt Hansen	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
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*For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil*

# Oil Sands Products Spill Response

**Mission Need:** Research and develop enhanced decision-making tools and recovery/mitigation tools for responding to spilled oil sands products.

## Project Objectives:

- Research and develop decision making tools for Federal On-Scene Coordinator (FOSC) to aid in response planning for spills of oil sand products in fresh and salt water.
- Analyze and assess behavior, response issues and strategies in fresh and salt waters.



## Key Milestone / Deliverable Schedule:

Project Start .....	31 Aug 14 ✓
★ <b>Response to Oil Sands Products Assessment.....</b>	<b>29 Sep 15 ✓</b>
Oil Sands Products Skimmer Evaluation.....	Feb 17
Development of Bottom Mitigation Techniques Part 1.....	Apr 17
Development of Bottom Mitigation Techniques Part 2 Tests.....	Dec 18
★ <b>Mitigation of Oil Moving Along the Bottom.....</b>	<b>Jul 19</b>
★ <b>FOSC Job Aid for Mitigation of Oil Sands Products .....</b>	<b>Nov 19</b>
Project End .....	Feb 20

★ Indicates RDC product.

<b>Sponsor:</b> CG-MER	
<b>Stakeholder(s):</b> EPA, LANT, PAC, NOAA	
<b>Project #:</b> 4705	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
<b>Notes:</b> <ul style="list-style-type: none"> <li>• Partnering with Great Lakes Restoration Initiative under the Clean water Act 33 USC 1251-1387.</li> <li>• Working to develop Cooperative Research and Development Agreement with Enbridge Pipeline.</li> <li>• Supports the Coast Guard Energy Renaissance Initiative.</li> <li>• Potential partnership with Bureau of Safety and Environmental Enforcement.</li> </ul>	
<b>RDC POC:</b> Mr. Kurt Hansen	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
<i>For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil</i>	



# Shale Oil & Gas Preparedness and Response

**Mission Need: Responders need best strategies, tactics, and equipment for preparedness and response to spills of shale oils and Shale Gas Extraction Wastewater (SGEWW).**

## Project Objectives:

- Develop an assessment characterizing the behavior of shale oil and chemical composition of SGEWW.
- Develop a scientifically sound best practices guide for preparedness and response to spills of shale oils and SGEWW for use by Coast Guard field responders and Area Committees.
- Provide decision makers with valuable reference material for use in making response policy decisions regarding the shipment of shale oil and SGEWW products via U.S. Waterways.



Source: NOAA

## Key Milestone / Deliverable Schedule:

Project Start.....	28 Oct 15 ✓
Literature Review Completed.....	1 Apr 16 ✓
Gap Analysis Reports.....	Sep 16
Key Decision Point (KDP): Best Practices Policy Doc vs. FOSC Response Guide.....	Oct 16
★ <b>Recommendations for Shale Oil &amp; Gas Response Practices Guide.....</b>	<b>Jun 17</b>
KDP: Project Continuation.....	Jul 17
Project End.....	Aug 17

## **Sponsor:**

CG-MER, EPA

## **Stakeholder(s):**

LANT, PAC, CG Districts, NSF

**Project #:**  
4707

## **Expected Benefit:**

Improved Doctrine/CONOPS/TTPs

## **Notes:**

- Great Lakes Restoration Initiative (GLRI) to fund direct project costs.
- Supports the Coast Guard Energy Renaissance Initiative.

## **RDC POC:**

Ms. Danielle Elam

## **CG-926 Domain Lead:**

Mr. Shannon Jenkins

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★ Indicates RDC product.



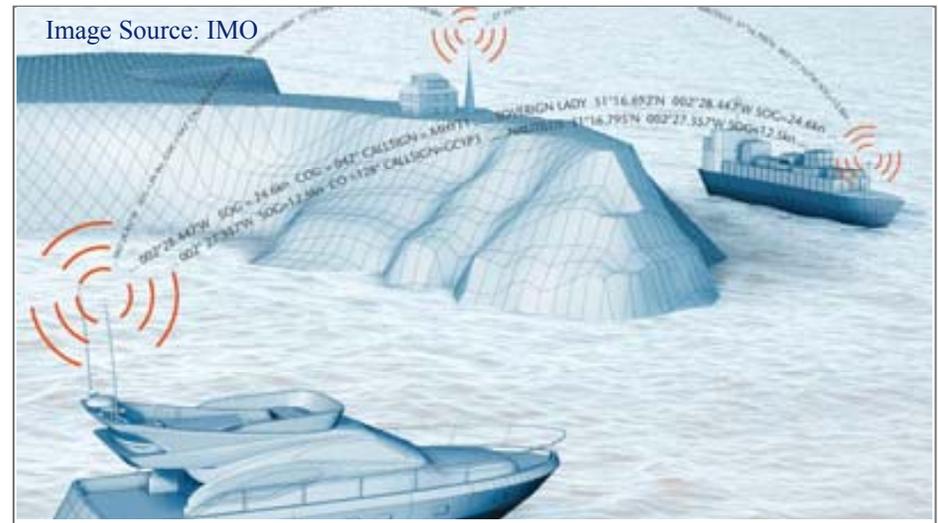
# Next Generation Arctic Navigational Safety Information System

**Mission Need:** Reliable critical navigational safety information to identify, assess, and mitigate navigational risks in the Arctic region.

## Project Objectives:

Partner with Marine Exchange Alaska (MXAK) to:

- Define the prototype system that will be developed under this public/private partnership.
- Develop the Arctic Navigation Safety Information System (ANSIS) prototype system for the technology demonstration.
- Install, test, and utilize ANSIS technology demonstration system.
- Monitor ANSIS technology demonstration system performance and mariner utilization.



## Key Milestone / Deliverable Schedule:

Project Start.....	4 Nov 13 ✓
Design ANSIS for Tech Demonstration.....	20 Jun 14 ✓
★ <b>ANSIS Functional Design Letter Report.....</b>	<b>9 Sep 14 ✓</b>
★ <b>Maritime Geo-Fence Tech Demonstration Letter Report.....</b>	<b>25 Jul 16 ✓</b>
Test & Utilize ANSIS Technology Demonstration System (Automatic Identification System (AIS) Transmit in Arctic Exclusive Economic Zone).....	27 Jul 15 ✓
Build and Develop ANSIS Technology Demonstration System (Digital Radio Mondiale over High Frequency Beta Test).....	Oct 16
★ <b>Enhancement to Improve AIS Radio-Link Performance.....</b>	<b>Aug 17</b>
★ <b>ANSIS Technology Demonstration Letter Report.....</b>	<b>Dec 17</b>
Project End.....	Feb 18

★ Indicates RDC product.

**Sponsor:** CG-NAV

**Stakeholder(s):** CG-761, C3CEN, D17, PAC, CG-5PW

<b>Project #:</b> 6211	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Project includes use of a Cooperative Research and Development Agreement.
- Supports development and implementation of CG Arctic strategy and public/private partnerships.
- Leverage other RDC efforts, including Project 2722, 5711, & 8113.

<b>RDC POC:</b> Ms. Irene Gonin	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
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*For more information, call (860) 271-2600 or  
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# Environment & Waterways (E&W) Branch Support

**Mission Need:** Maintain RDC Branch competency and knowledge, provide rapid response, and provide external liaison.

## Project Objectives:

- Maintain RDC competency/technical knowledge in understanding present and future CG mission performance gaps that are within the Branch's purview.
- Maintain RDC competency in technologies that currently or potentially could be used to eliminate or reduce CG mission performance gaps within the Branch's purview.
- Maintain RDC competency/technical knowledge necessary to maintain leadership within the appropriate Subject Matter Expert community.



## Key Milestone / Deliverable Schedule:

Project Start .....	3 Dec 07 ✓
FY17 Great Lakes Restoration Initiative Funding Plans.....	Nov 16
FY18-19 Idea Submission Review.....	Nov 16
FY18 Assessment of Prospective Portfolio.....	Feb 17
FY18 Project Execution Plan (PEP) Ramp Up.....	Jun 17
New PEPs/Proposals.....	As Required
Conduct Market Research.....	As Required
Technology Conferences.....	As Required
Project End.....	TBD

**Sponsor:** CG-926

**Stakeholder(s):**

<b>Project #:</b> 9993	<b>Expected Benefit:</b> Add to general R&D knowledge base
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**Notes:**

**RDC POC:**  
Mr. James Fletcher

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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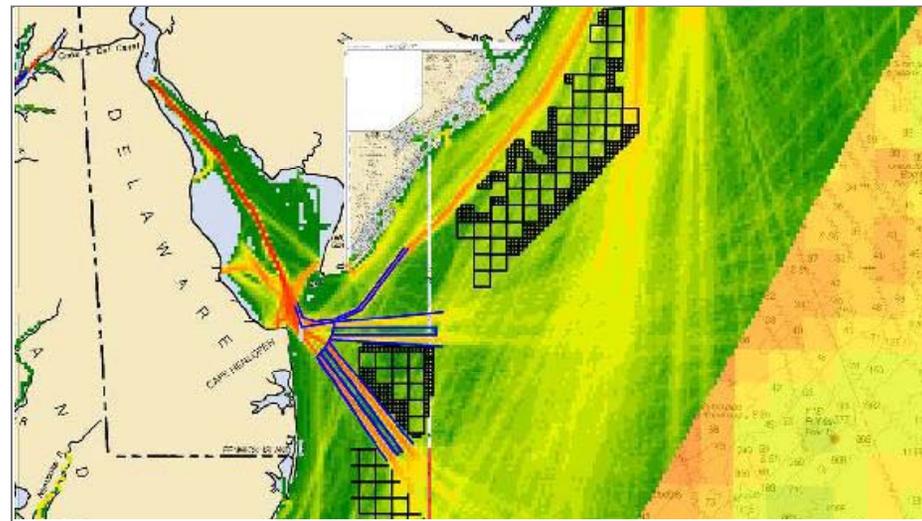
★ Indicates RDC product.

# Navigational Safety Risk Modeling and Analysis Tool

**Mission Need:** Capability to fully characterize the impact of rerouting traffic, funneling traffic, and placement of offshore structures in terms of risk.

## Project Objectives:

- Analytical modeling process and analysis tools to predict changes in traffic patterns and determine the resultant changes in navigational safety risk.
- The ability to assess the proposed wind energy areas to further refine appropriate distances between shipping and structures.
- The ability to assess the need to create routing measures to mitigate risk posed by fixed structures.
- Review Pacific Northwest National Laboratory (PNNL) tool.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Assessment of Risk Modeling Tools.....	Aug 17
Key Decision Point to Continue.....	Aug 17
Creation of a Risk Modeling Package.....	Feb 18
★ <b>Risk Assessment Model.....</b>	<b>Mar 18</b>
Key Decision Point to Continue .....	Apr 18
★ <b>After Action T&amp;E Report.....</b>	<b>Aug 18</b>
Project End.....	Aug 18

**Sponsor:** CG-5PW, CG-NAV

**Stakeholder(s):** LANT

<b>Project #:</b> 2016-29	<b>Expected Benefit:</b> Influence Mission Support efficiencies
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- Notes:**
- Supports the Coast Guard Western Hemisphere Strategy and Energy Renaissance Initiative.
  - Continuation of the Atlantic Coast Port Access Route Study (ACPARS) with requirements as documented in the Interim Report from July 2012 and the Final Report from February 2016.
  - Possible partnership with DHS Center of Excellence (COE) at Purdue and the Bureau of Ocean Energy Management.

**RDC POC:**  
Ms. Christine Hansen

**CG-926 Domain Lead:**  
Mr. Curtis Catanach

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★ Indicates RDC product.



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# Develop Innovative Interdiction Patrol Tactics

**Mission Need:** Improve efficiency and effectiveness of interdiction mission patrols.

## Project Objectives:

- Assess the advantages and disadvantages of using probabilistic-based search and game theory algorithms to improve patrol tactics for each geographic area of interest.
- Evolve the model incorporating the optimal tactics under the assumption that the adversary will adapt to estimate interval between adversary tactical shifts and potential leading indicators.
- Deploy proof-of-concept for field evaluation and initial response.
- Develop an adaptive, multi-stage campaign-modeling approach to analyze alternative adversary tactical strategies as they shift in reaction to Coast Guard tactics, techniques, and procedures.



## Key Milestone / Deliverable Schedule:

Project Start.....	1 Oct 14 ✓
Complete Data and Model Development.....	7 Aug 15 ✓
Tactical Concept Development and Evaluation.....	1 Dec 15 ✓
Proof of Concept Deployment.....	9 Dec 15 ✓
★ <b>Florida Straits Air Campaign Analysis Report.....</b>	<b>27 Jul 16 ✓</b>
Multi-stage Campaign Evaluation.....	Sep 16
★ <b>Interdiction Tactical Patrol Scheduling Evaluation Report....</b>	<b>Sep 16</b>
Project End.....	Oct 16

**Sponsor:** CG-MLE  
**Stakeholder(s):** LANT, PAC, D7, D11, JIATF South, JIATF West, JTF-E

<b>Project #:</b> 5676	<b>Expected Benefit:</b> Improve operational performance/ efficiency/ mission execution/ resiliency
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**Notes:**

- Leverages previous/ current work such as: Game Theoretic Fish Patrol Schedule Model, Panga Research, and Port Resilience Operational/ Tactical Enforcement to Counter Terrorism.
- Supports the Coast Guard Western Hemisphere Strategy and the Department of Homeland Security Southern Border and Approaches Campaign Plan.

<b>RDC POC:</b> Mr. Sam Cheung	<b>CG-926 Domain Lead:</b> Mr. Curtis Catanach
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*For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil*

★ Indicates RDC product.

# Mass Migration Modeling and Analysis

**Mission Need:** Improved planning for a mass migration event.

## Project Objectives:

- Develop a modeling suite that would provide a capability for force-on-force modeling and optimization of force package employment for Migrant Interdiction Operations in the Florida Straits. Create a portfolio of optimized deployment and support options based on the nature and volume of the migrant flow and capability/capacity of the Coast Guard Forces.
- Use the modeling capability to develop a similar mass migration response playbook for Mona Pass Migrant Interdiction Operations.
- Use existing campaign-level modeling to estimate the effect redeployment of additional assets to mass migration response will have on other missions during the event and recovery period.



## Key Milestone / Deliverable Schedule:

Project Start.....	28 Oct 14	✓
Project Placed On Hold.....	30 Jun 15	✓
Project Re-Start.....	Oct 16	
Develop Florida Straits Model .....	Apr 17	
★ <b>Florida Straits Playbook.....</b>	<b>Jun 17</b>	
Develop Mona Pass Model.....	Jul 17	
★ <b>Mona Pass Playbook.....</b>	<b>Sep 17</b>	
Follow-on Campaign Analysis.....	Dec 17	
★ <b>Campaign Analysis Report.....</b>	<b>Jan 18</b>	
Project End.....	Feb 18	



★ Indicates RDC product.

**Sponsor:** CG-MLE  
**Stakeholder(s):** D7, CG-771, Homeland Security Task Force-Southeast

<b>Project #:</b> 9365	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Supports the Coast Guard Western Hemisphere Strategy.

**RDC POC:**  
Mr. Michael Lehocky

**CG-926 Domain Lead:**  
Mr. Curtis Catanach

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# Modeling & Simulation (M&S) Center of Expertise (COE) Branch Support

**Mission Need:** Maintain RDC Branch competency and knowledge; provide rapid response and provide external liaison.

## Project Objectives:

- Maintain and enhance Branch competencies (Fleet Mix Strategic Analysis, Tactical Force Package Analysis, Sensor Performance Analysis, Data Repository, Analysis, and Visualization).
- Provide CG-9 a core competency for analysis, modeling and simulation by investigating/developing modeling approaches that provide more efficacy and efficiency for acquisition decision-making.

## Key Milestone / Deliverable Schedule:

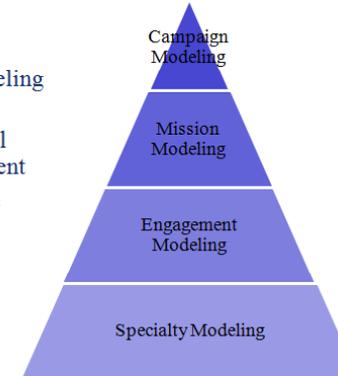
Project Start.....	3 Dec 11 ✓
Annual Maritime Risk Symposium .....	Nov 16
FY18-19 Idea Submission Review.....	Nov 16
FY18 Assessment of Prospective Portfolio.....	Feb 17
New Project Execution Plans/Proposals/Tasks.....	As Required
Accreditation Management.....	As Required
Technology Conferences.....	As Required
Project End .....	TBD

★ Indicates RDC product.

## **Analysis Questions → Skilled Analysts/Tools → Analysis Products**

### Ex. Tools:

- CGMOES
- Arctic Tactical Modeling Environment
- Coast Guard Tactical Modeling Environment
- Human Performance Modeling
- Cost Modeling



### Ex. Analysis Products:

- Fleet Mix Analysis (CG-wide, Western Rivers)
- OPC Alternatives Analysis
- HLS Mission Analysis
- DOMICE Mission Analysis
- VUAV/UAS4NSC
- D7 Airship Analysis
- Manned Covert Surveillance Aircraft CONOPs
- C4ISR Alternatives Analysis
- SIGINT Requirements & Capabilities Analysis

**Sponsor:** CG-926

**Stakeholder(s):**

<b>Project #:</b> 9997	<b>Expected Benefit:</b> Add to general R&D knowledge base
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## Notes:

**RDC POC:**  
CDR Erich Stein

**CG-926 Domain Lead:**  
Mr. Curtis Catanach

*For more information, call (860) 271-2600 or  
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# Short Term Modeling & Simulation Support Efforts (M&S COE Tasks)

## Purpose:

Provide Modeling, Simulation or Analysis to focused operational or business questions. Short term efforts are characterized by limited complexity with the need for standard technical and contracting approaches.

## FY17 Efforts:

Task	Title	Objective	Office Supported	Funding Type	RDC POC	CG-926 Domain Lead	Due/Delivery Date
7400029	sUAS Airspace Analysis	<i>Airspace Density Analysis that will be used for enabling beyond line of sight UAS operations from the NSC. Analysis to inform UAS TTP and operations.</i>	CG-711	AC&I	LT Ben Walsh	Mr. Curtis Catanach	Dec 16

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



# Corrosion Control and Monitoring

**Mission Need: Mitigate corrosion impacts on cutters by increasing mission support efficiencies and reducing costs.**

## Project Objectives:

- Identify and benchmark current USCG corrosion mitigation strategies.
- Research the recent advancements in commercial anti-corrosion coatings with respect to Coast Guard surface fleet applications.
- Coordinate with U.S. Navy and other military services to investigate their corrosion mitigation strategies.
- Stand up a USCG Corrosion Integrated Product Team (IPT) with representatives from Surface Forces Logistics Center (SFLC), RDC, HQ Units, AREAS, Product Lines, and other stakeholders to down-select promising corrosion technologies.
- Document findings and provide recommendations in a Corrosion Roadmap.
- Conduct operational and laboratory testing of selected methods in Phase II, based on selected cutter class.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
Benchmark USCG Corrosion Strategies.....	Apr 17
Conduct Market Research .....	Apr 17
Review Request for Information Results.....	May 17
Stand up Corrosion IPT .....	Jun 17
Review Research Results and IPT Efforts.....	Aug 17
★ <b>Corrosion Control Roadmap .....</b>	<b>Oct 17</b>
Conduct Operational & Laboratory Testing.....	Aug 18
Project End.....	Sep 18

**Sponsor:** CG-45  
**Stakeholder(s):** SFLC, CG-41, CG-43, CG-44, CG-751, LANT, PAC

<b>Project #:</b> 2017-7	<b>Expected Benefit:</b> Influence Mission Support efficiencies
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**Notes:**

- Potential partner with similar Navy and Oak Ridge National Lab efforts.
- Will leverage substantial ongoing research by other government agencies on this topic.
- Supports the Coast Guard Western Hemisphere and Arctic Strategies.

<b>RDC POC:</b> Mr. Mike Coleman	<b>CG-926 Domain Lead:</b> LT Steve Hager
-------------------------------------	--

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

★ Indicates RDC product.

# Diesel Outboard Development

**Mission Need: Single fueled fleet.**

## Project Objectives:

- Document current developmental stage of diesel outboards applicable to Coast Guard usage.
- Conduct cost-benefit analysis of implementing diesel outboard engines in the Coast Guard.
- Investigate partnership options with manufacturers and other government agencies and test promising diesel outboard engine technologies to better understand performance capabilities.
- Provide recommendations for potential future acquisition initiatives, as appropriate.



## Key Milestone / Deliverable Schedule:

Project Start.....	27 Feb 14 ✓
Issue Request for Information.....	3 Apr 14 ✓
★ <b>Market Availability PowerPoint.....</b>	<b>18 Sep 14 ✓</b>
★ <b>Cost Benefit Analysis Report.....</b>	<b>24 Jul 15 ✓</b>
Key Decision Point to Determine Path Forward.....	24 Jul 15 ✓
Conduct Spark-Ignited Diesel Outboard Engine Testing.....	Oct 16
Conduct Compression-Ignited Diesel Outboard Engine Testing.....	Feb 18
★ <b>Diesel Outboard Feasibility Report.....</b>	<b>Jun 18</b>
Project End.....	Jun 18

**Sponsor:** CG-45

**Stakeholder(s):** CG-731, SFLC, CG-DOL

<b>Project #:</b> 4110	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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### Notes:

- Project will include Cooperative Research and Development Agreements.
- RDC will establish partnerships with Joint Task Force-East, Customs and Border Protection, Immigration and Customs Enforcement, and DHS Science & Technology and will continue to leverage partnership with Navy Combatant Craft Division to test diesel outboard engines, where possible.

**RDC POC:**  
LT Keely Higbie

**CG-926 Domain Lead:**  
LT Steve Hager

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

★ Indicates RDC product.



**Acquisition Directorate**  
**Research & Development Center**

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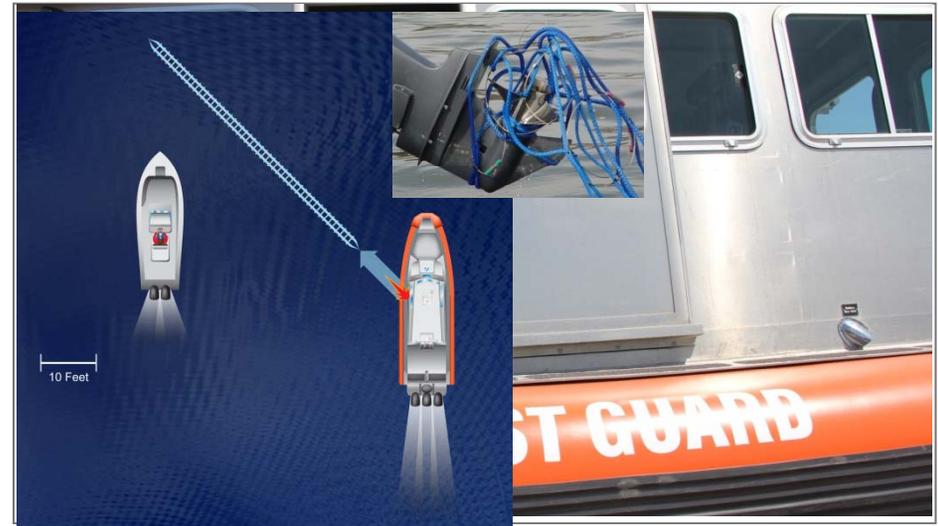
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# Joint Non-Lethal Weapons Directorate Small Vessel Entanglement

**Mission Need:** A capability to non-lethally stop a non-compliant vessel.

## Project Objectives:

- Team with Naval Surface Warfare Center (NSWC) Dahlgren and Carderock to: Conduct tests on outboard and inboard vessels, optimize full-scale net design, and develop and demonstrate launcher capabilities.
- Once the system design is complete, conduct a Limited User Evaluation (LUE) to evaluate system for fleet use.
- Draft and finalize Tactics, Techniques, and Procedures (TTP) for CG fleet use.



## Key Milestone / Deliverable Schedule:

Project Start .....	12 Dec 07 ✓
★ <b>Delivered 8 Prior Year Products .....</b>	✓
Small Vessel Surface Entanglement (SVSE) Prototype System Delivered/DT&E.....	26 Mar 12 ✓
Monitor and Support LUE (D8).....	31 Jan 14 ✓
Observe Other SVS Technologies .....	3 Nov 14 ✓
Support TTP Development.....	31 Aug 15 ✓
Monitor and Support LUE (D7).....	1 Jun 16 ✓
★ <b>Joint Non-Lethal Weapons Directorate (JNLWD) Small Vessel Surface (SVS) SNARE Progress Report.....</b>	<b>Nov 16</b>
Project End .....	Dec 16

**Sponsor:** CG-721  
**Stakeholder(s):** FORCECOM, PAC, LANT, MSRT, MSST, DCO, JTF-E, CG-MSR-1

<b>Project #:</b> 56411	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Partnering with Office of Naval Research (ONR), Joint Non-Lethal Weapons Directorate (JNLWD) and DoD efforts.
- Supports the Coast Guard Western Hemisphere Strategy.

<b>RDC POC:</b> LT Carlon Brietzke	<b>CG-926 Domain Lead:</b> LT Steve Hager
---------------------------------------	--

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

★ Indicates RDC product.

# Non-Lethal Impact Munitions (NLIM)

**Mission Need: Capability to enforce maritime law with non-lethal systems.**

## Project Objectives:

- Participate in the NLIM Working Group:
  - Contribute to the selection of non-lethal weapons for the Coast Guard.
  - Contribute to the selection and prioritization of Key Performance Parameters (KPP) and Key System Attributes (KSA) for non-lethal weapon systems for the Coast Guard fleet.
- Evaluate the selected NLIM rounds and weapons systems, against the KPP's and KSA's selected by the NLIM Working Group.
- Assist the working group in drafting Tactics, Techniques and Procedures (TTP).



## Key Milestone / Deliverable Schedule:

Project Start.....	4 Nov 13 ✓
Developmental Test and Evaluation (DT&E) to Evaluate the NLIM Systems.....	7 Apr 14 ✓
NLIM Working Group Meeting.....	1 Jun 14 ✓
★ <b>NLIM Development, Test and Evaluation (DT&amp;E) Report....</b>	<b>1 Oct 14 ✓</b>
NLIM TTP Integrated Product Team (IPT).....	3 Nov 14 ✓
Train-the-Trainer for NLIM Limited User Evaluation.....	30 May 15 ✓
NLIM Limited User Evaluation.....	1 Jun 16 ✓
Working Group Develops TTP.....	Oct 16
★ <b>NLIM Limited User Evaluation Summary Letter Report.....</b>	<b>Feb 17</b>
Project End.....	Mar 17

★ Indicates RDC product.

**Sponsor:** CG-721  
**Stakeholder(s):** CG-7d, CG-5RE, CG-MLE, FC-T, FC-A, JTF-E

<b>Project #:</b> 5674	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Partnering with Technical Support Working Group (TSWG) and Joint Non-Lethal Weapons Directorate (JNLWD).
- Supports the Coast Guard Western Hemisphere Strategy.

**RDC POC:**  
Mr. Scot Tripp

**CG-926 Domain Lead:**  
LT Steve Hager

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# Non-Compliant Vessel Stopping Using Less-than-Lethal Radio Frequency Technologies

**Mission Need:** Investigate more options for stopping non-compliant vessels.

## Project Objectives:

- Gather different Radio Frequency Vessel Stopping (RFVS) technologies currently available and select most promising technologies for further evaluation.
- Identify mission requirements for possible CG applications.
- Identify weight, size and power issues for selected technologies and missions.
- Continue to monitor technology progression, including other applications of directed energy.
- Attend demonstrations by other government agencies of the various technologies and monitor applications to CG missions.
- Participate in testing the prototype on a CG platform.



## Key Milestone / Deliverable Schedule:

Project Start.....	1 Dec 14 ✓
★ <b>Radio Frequency Vessel Stopping Summary Report FY15...</b>	<b>4 Feb 15 ✓</b>
Identify the Components to Prototype .....	Nov 16
★ <b>Radio Frequency Vessel Stopping Summary Report FY16.....</b>	<b>Feb 17</b>
Research Feasibility of Concept .....	Sep 17
★ <b>Radio Frequency Vessel Stopping Summary Report FY17.....</b>	<b>Feb 18</b>
Build RFVS Prototype .....	Sep 18
★ <b>Radio Frequency Vessel Stopping Summary Report FY18.....</b>	<b>Feb 19</b>
Demonstrate Feasibility .....	Sep 19
Developmental Test & Evaluation of RFVS Prototype.....	Sep 20
Project End.....	Oct 20

★ Indicates RDC product.

**Sponsor:** CG-721

**Stakeholder(s):** FORCECOM, PAC, LANT, MSRT

<b>Project #:</b> 5678	<b>Expected Benefit:</b> Inform follow-on acquisition/enterprise deployment
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### Notes:

- Partnering with Office of Naval Research, Naval Surface Warfare Center Dahlgren Division and Joint Non-lethal Weapons Directorate.
- Supports the Coast Guard Western Hemisphere Strategy.
- Investigate possible application to other missions and units.

**RDC POC:**  
Ms. D.J. Hastings

**CG-926 Domain Lead:**  
LT Steve Hager

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# Evaluation of Helmet Wear for CG Personnel

**Mission Need:** Quantitative efficacy of boat helmet performance.

## Project Objectives:

- Determine appropriate quantitative level(s) of protection for helmets worn by Coast Guard members during boat operations including: surf, heavy weather, pursuit, cutter boat launch and recovery, etc.
- Recommend mitigation strategies to achieve increased level(s) of protection for helmets worn by Coast Guard members if warranted.



## Key Milestone / Deliverable Schedule:

Project Start.....	29 Oct 14 ✓
Stakeholder Risk Based Decision Making Workgroup Established.....	20 Jan 15 ✓
Head Protection Survey Distributed.....	17 Dec 15 ✓
Quantitative Hazards/Dynamic Forces Documented.....	Aug 16
Head Protection Survey Results Briefing.....	Oct 16
Commercial Off the Shelf/Government Off the Shelf Performance Mapping to Requirements.....	Nov 16
★ <b>Helmet Protection Levels for CG Boat Operators.....</b>	<b>Jan 17</b>
Project End.....	Feb 17

**Sponsor:** CG-731

**Stakeholder(s):** CG-741, CG-751, CG-MLE, CG-1

<b>Project #:</b> 5806	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Supports the Coast Guard Human Capital Strategy.

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Mr. Brian Dolph

**CG-926 Domain Lead:**  
LT Steven Hager

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★ Indicates RDC product.

# Define and Communicate Exclusion Zones

**Mission Need:** Capability to physically mark and clearly communicate the boundaries of an area of exclusion, including both fixed and moving security zones.

## Project Objectives:

- Review user needs, consider short-term and longer-term solutions.
- Investigate solutions on the market to determine the best possible solutions to evaluate.
- Select and test prototype solution(s) that will unambiguously mark fixed and moving security zones.



## Key Milestone / Deliverable Schedule:

Project Start.....	4 Feb 14 ✓
Unit Visit/Market Research Request for Information (RFI).....	6 Aug 14 ✓
★ <b>Phase 1 Summary of Current Market Research.....</b>	<b>21 Oct 14 ✓</b>
Sponsor Change to CG-721.....	6 Mar 15 ✓
Manufacturing Delay of Test Articles.....	19 Feb 16 ✓
Demonstration of Capabilities.....	Aug 16
★ <b>Phase 2 Report on Short-Term Field Evaluation.....</b>	<b>Feb 17</b>
Go/No-Go Decision Point .....	Jul 17
Conduct Long-Term Solution Field Evaluation .....	Dec 17
★ <b>Phase 3 Report on Long-Term Solution Field Evaluation.....</b>	<b>Apr 18</b>
Project End.....	Nov 18

★ Indicates RDC product.

**Sponsor:** CG-721

**Stakeholder(s):** CG-MSR, MSRT, LANT, PAC

<b>Project #:</b> 5921	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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### Notes:

- Leverages previous work on Project Unambiguous Warning Devices.
- Supports the Coast Guard Western Hemisphere Strategy.
- Potential partnership with National Urban Security Technology Laboratory (NUSTL).

**RDC POC:**  
Ms. D.J. Hastings

**CG-926 Domain Lead:**  
LT Steve Hager

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# Arctic Operations Support

**Mission Need: Provide support for expanded operational and resource capabilities assessments in the Arctic.**

## Project Objectives:

- Based on previous years' demonstrations and evaluations, continue to support projects that will develop capability improvements in the execution of Coast Guard missions in the Arctic.
- Continue to nurture joint efforts and interagency cooperation between government sectors and civilian entities on the North Slope and abroad.
- Facilitate and provide support to other Arctic projects, including Department of Homeland Security (DHS) Science & Technology (S&T) Office of University Programs (OUP), in accomplishing their testing objectives.
- Continue to monitor technology progression.



## Key Milestone / Deliverable Schedule:

Project Start.....	10 Oct 13	✓
★ <b>Delivered 3 Prior Year Products.....</b>		✓
Identify Available Assets for Testing.....	12 Feb 16	✓
Site Visit.....	10 Jun 16	✓
Test Plans Finalized.....	30 Jun 16	✓
Conduct Technology Evaluations.....	Aug 16	
★ <b>Arctic Technology After Action Report 2016.....</b>	<b>Oct 16</b>	
Test Plan Finalized.....	Jun 17	
Conduct Technology Evaluations.....	Aug 17	
★ <b>Arctic Technology After Action Report 2017.....</b>	<b>Oct 17</b>	
Project End.....	Nov 17	

★ Indicates RDC product.

<b>Sponsor:</b> CG-5PW	
<b>Stakeholder(s):</b> D17, PAC, CG-7, DHS S&T OUP	
<b>Project #:</b> 6210	<b>Expected Benefit:</b> Influence Mission Support efficiencies
<b>Notes:</b>	
<ul style="list-style-type: none"> <li>• Project will leverage other organizations with Arctic interests/efforts to the maximum extent possible.</li> <li>• Follow on to 2012/2013/2014/2015 and 2016 efforts.</li> <li>• Supports the Coast Guard Arctic Strategy.</li> <li>• Partner with CG-DCO-X for engagement with Arctic Evergreen project.</li> <li>• Collaborate with DHS S&amp;T OUP for principle investigator engagement.</li> </ul>	
<b>RDC POC:</b> Mr. Scot Tripp	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
<p><i>For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil</i></p>	

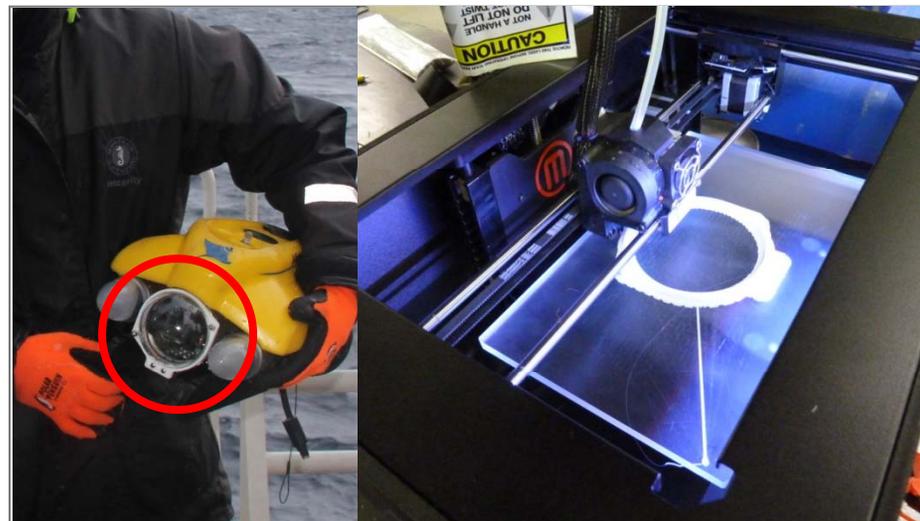


# Evaluation of Three-Dimensional (3D) Printing Technology for Coast Guard Applications

**Mission Need:** Assessment of the potential for 3D printers to improve mission readiness by reducing logistical support lead times.

## Project Objectives:

- Research the advancements made with the spiral development of 3D printing technology with respect to Coast Guard applications.
- Identify CG units that are best suited to implement additive manufacturing, conduct training, and trail 3D printing technologies.
- Research cost, logistical, and performance issues that could be addressed with 3D printing and additive manufacturing.
- Work with Surface Forces Logistics Center and Aviation Logistics Center to develop the required process for approving 3D printed parts for operational use.
- Document findings and provide recommendations for decision makers.



## Key Milestone / Deliverable Schedule:

Project Start.....	11 Jan 16 ✓
Identify Units for 3D Printing Trial.....	23 Feb 16 ✓
Provide 3D Printers to Units.....	25 May 16 ✓
Conduct 3D Printing Trial.....	28 Jun 16 ✓
★ <b>Investigation of 3D Printing Technology for Coast Guard Applications Report.....</b>	<b>Mar 17</b>
Work to Develop Process for New Component Approval .....	Jan 17
Underway Additive Manufacturing Demonstration .....	Jun 17
★ <b>Roadmap for Integration of Additive Manufacturing Report.....</b>	<b>Mar 18</b>
Project End.....	Mar 18

★ Indicates RDC product.

**Sponsor:** CG-44  
**Stakeholder(s):** CG-41, CG-43, CG-45, CG-DOL, DIUx

**Project #:** 7758  
**Expected Benefit:** Influence Mission Support efficiencies

- Notes:**
- Partnering with the Chief of Naval Operation's Rapid Innovation Cell, Naval Warfare Development Command.
  - Will work through CG-STIC for integration into the fleet.
  - Partner with Oak Ridge National Lab.

<b>RDC POC:</b> Mr. Jason Story	<b>CG-926 Domain Lead:</b> LT Steve Hager
------------------------------------	--

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



# Evaluation of WMEC 270' Pitch/RPM Schedules

**Mission Need:** Improved energy efficiency in the operation of cutters to help meet energy conservation goals and Greenhouse Gas (GHG) reduction goals.

## Project Objectives:

- Assess pre-determined pitch/Revolutions per Minute (RPM) combinations through comprehensive underway data collection with an operational cutter.
- Analyze results and compare with prior (1998) fuel savings projections.
- Deliver recommendations for implementation.



## Key Milestone / Deliverable Schedule:

Project Start .....	4 Nov 13 ✓
★ <b>Interim Letter Report - Evaluation of 270' WMEC Pitch/RPM Schedule Changes.....</b>	<b>23 Jul 14 ✓</b>
Baseline Data Collection .....	26 Sep 14 ✓
Conduct Sea Trial(s) .....	16 Jun 16 ✓
Data Analysis.....	Oct 16
Develop Recommendation to Schedule Changes .....	Nov 16
★ <b>Evaluation of 270' WMEC Pitch/RPM Schedule Changes.....</b>	<b>Jan 17</b>
Project End .....	Feb 17

**Sponsor:** CG-46

**Stakeholder(s):** SFLC

<b>Project #:</b> 7805	<b>Expected Benefit:</b> Direct Product Line/Core Technology Support (Tech refresh, DMS, etc)
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## Notes:

- Supports the Coast Guard Energy Renaissance Initiative.

**RDC POC:**  
Mr. Jay Carey

**CG-926 Domain Lead:**  
LT Steve Hager

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★ Indicates RDC product.



**Acquisition Directorate**  
**Research & Development Center**

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# Surface Branch Support

**Mission Need:** Maintain RDC Branch competency and knowledge; provide rapid response; and provide external liaison.

## Project Objectives:

- Maintain RDC competency and technical knowledge in understanding present and future CG Port Security and Law Enforcement mission performance gaps. Partner with Joint Non-Lethal Weapons Directorate and Domestic Nuclear Detection Office to leverage efforts.
- Maintain competency and technical knowledge in Vessel Technology, Alternative Energy, Energy Efficiency, and Acquisition Programs Support.
- Support CG Weapons of Mass Destruction program by providing subject matter expertise and other government agency leveraging.
- Coordinate Arctic projects.



## Key Milestone / Deliverable Schedule:

Project Start.....	3 Dec 07 ✓
FY18-19 Idea Submission Review.....	Nov 16
FY18 Assessment of Prospective Portfolio.....	Feb 17
★ <b>REACT: Stand-off Chemical Threat Detector.....</b>	<b>Mar 17</b>
Conduct Market Research.....	As Required
Technology Conferences.....	As Required
Project End.....	TBD

**Sponsor:** CG-926

**Stakeholder(s):**

<b>Project #:</b> 9994	<b>Expected Benefit:</b> Add to general R&D knowledge base
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**Notes:**

**RDC POC:**  
Mr. Rich Hansen

**CG-926 Domain Lead:**  
LT Steven Hager

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★ Indicates RDC product.

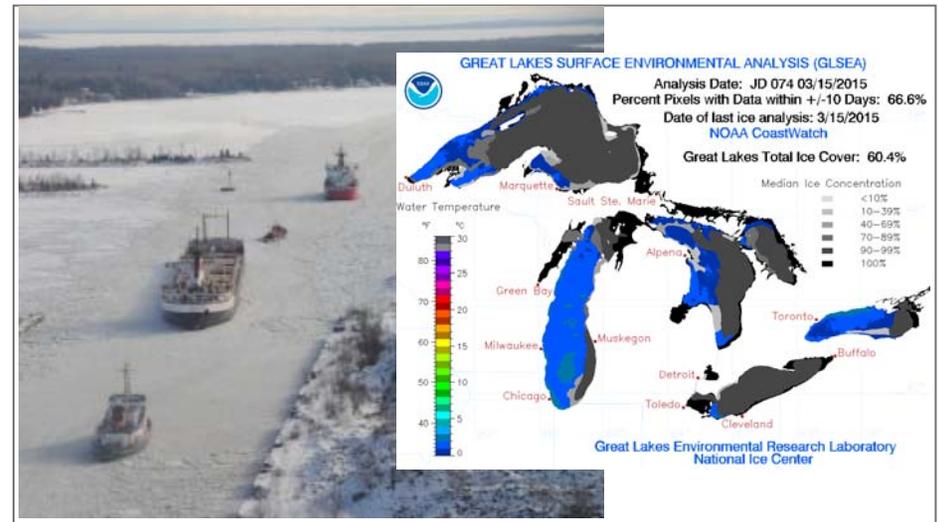


# Ice Condition (ICECON) Risk Assessment Tool(s)

**Mission Need: Method to forecast and share ice conditions.**

## Project Objectives:

- Develop ice condition classification methodology.
- Develop ship classifications for Great Lakes.
- Validate ice and ship classifications with observed conditions.
- Develop ICECON nowcast and forecast methodology.
- Adjust forecast methodology with icebreaker activity.
- Provide ICECON forecast system for decision support.



## Key Milestone / Deliverable Schedule:

Project Start.....	Oct 16
ICECON Workshop.....	Oct 16
★ <b>ICECON and Ship Classification Briefing .....</b>	<b>Jun 17</b>
★ <b>ICECON Forecast Model Briefing .....</b>	<b>Jun 18</b>
ICECON Model Validation.....	Dec 18
★ <b>Final ICECON Forecast Model Briefing .....</b>	<b>Jun 19</b>
Project End.....	Jul 19

**Sponsor:** CG-5PW

**Stakeholder(s):** CGD1, D9, D17, LANT, PAC, DHS S&T OUP

<b>Project #:</b> 2017-19	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Collaboration with Arctic Domain Awareness Center (ADAC).
- Supports the Coast Guard Arctic Strategy.

**RDC POC:**  
Mr. Mark VanHaverbeke

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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★ Indicates RDC product.



**Acquisition Directorate**  
**Research & Development Center**

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# Assessment of Unmanned Maritime Vehicles for CG Missions

**Mission Need: Economical, effective, persistent Maritime Domain Awareness (MDA) to support CG missions.**

## Project Objectives:

- Understand state-of-the-market autonomous sensors and platforms.
- Evaluate effectiveness of sensors and platforms for CG mission support.
- Model and evaluate full-scale application.
- Prepare rough order of magnitude business case.
- Conduct technology demonstration.
- Identify system development needs (sensors, processors, and vehicles) for CG application.



## Key Milestone / Deliverable Schedule:

Project Start.....	4 Nov 13 ✓
Observe Office of Naval Research (ONR) Tech Sea Trials.....	8 May 14 ✓
Market Research Report.....	24 Jul 14 ✓
KDP: Demonstration/ Phase 2 for “FY 15” Determination.....	5 Sep 14 ✓
★ <b>The Applicability of Persistent Marine Sensors and Platforms to Coast Guard Missions.....</b>	<b>30 Oct 14 ✓</b>
Technology Demonstration/ Execution of Plan.....	27 Jun 16 ✓
★ <b>Persistent Unmanned Maritime Vehicle System Capability Requirements for USCG Missions.....</b>	<b>Oct 16</b>
Evaluate UMV Sensors .....	Oct 16
★ <b>Unmanned Maritime Vehicle for Coast Guard Missions Demonstration Test Report.....</b>	<b>Jan 17</b>
Project End.....	Feb 17

★ Indicates RDC product.

<b>Sponsor:</b>	CG-761
<b>Stakeholder(s):</b>	CG-25, CG-731, CG-MLE, DHS S&T OUP, DHS S&T BMD, JIATF-S, JTF-E
<b>Project #:</b>	<b>Expected Benefit:</b>
7808	Improve operational performance/efficiency/mission execution/resiliency
<b>Notes:</b>	
<ul style="list-style-type: none"> <li>• Partner with ONR/Naval Undersea Warfare Center or National Oceanic and Atmospheric Administration.</li> <li>• Project derived from Congressional language.</li> <li>• Anticipate leveraging/partnering with new DHS Science &amp; Technology Office of University Programs Center for Maritime Research.</li> <li>• Supports the Coast Guard Western Hemisphere Strategy.</li> </ul>	
<b>RDC POC:</b>	<b>CG-926 Domain Lead:</b>
Mr. Mark VanHaverbeke	LT Steve Hager
<p><i>For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil</i></p>	

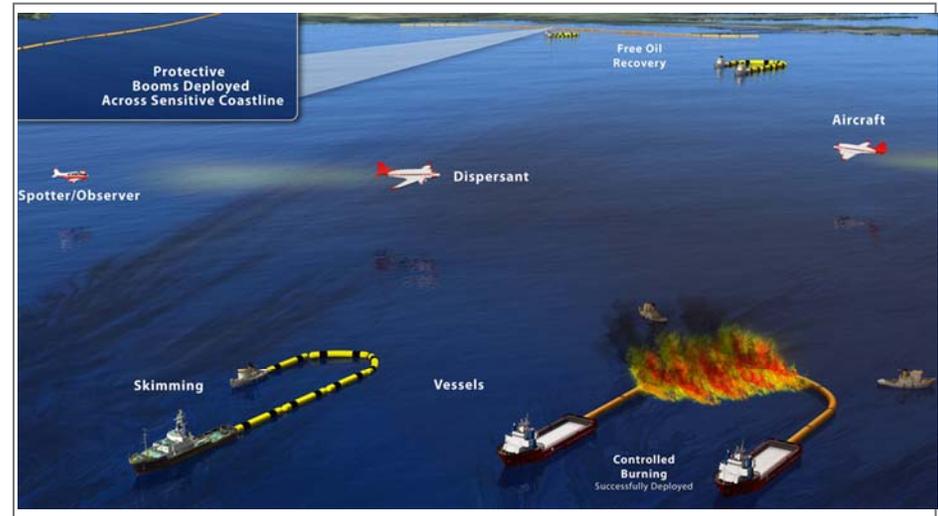


# Equipment Surge Risk Assessment Tool

**Mission Need:** A consistent and repeatable methodology for determining the level of risk associated with moving oil spill response resources from donor areas to a Spill of National Significance (SONS).

## Project Objectives:

- Develop a risk-informed, conceptual model of a decision-support process and tool that can help Area Committees, Regional Response Teams and Federal On-Scene Coordinators understand and assess what types and amounts of their spill response resources can temporarily be sent to SONS without putting their own locales in jeopardy.
- The conceptual model will:
  - Enhance a response planner’s understanding of the representative system.
  - Facilitate efficient conveyance of system details between stakeholders.
  - Provide a point of reference for system designers to extract specifications.
  - Document the system for future reference.



## Key Milestone / Deliverable Schedule:

Project Start.....	1 Oct 15 ✓
Conduct Technical Kick-Off Meeting.....	2 May16 ✓
Conduct Stakeholder Interviews.....	Aug 16
Develop Requirements & Conceptual Model.....	Sep 16
Validate Conceptual Model with Stakeholders.....	Feb 17
Contractor Delivers Draft Report.....	Apr 17
★ <b>Conceptual Model of a SONS Equipment Surge Risk Assessment Tool/Process.....</b>	<b>Jun 17</b>
Project End.....	Jul 17

**Sponsor:** CG-MER  
**Stakeholder(s):** NSFCC, PAC, LANT

<b>Project #:</b> 7935	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Collaborate with National Strike Force Coordination Center to establish requirements.

<b>RDC POC:</b> Mr. Warren Heerlein	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
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*For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil*

★ Indicates RDC product.

# Analysis of Methods and Underway Time to Develop and Maintain Crew Proficiency

**Mission Need:** Improve the development and maintenance of crew proficiency.

## Project Objectives:

- Determine minimum underway time currently required to build and maintain cutter crew proficiency.
- Identify operational knowledge and skills dependent on underway practice, vs. those that could be maintained with other methods ashore (e.g., simulators).
- Leverage U.S. Navy (USN), U.S. Air Force (USAF), and Canadian CG practices to develop and maintain proficiency.



## Key Milestone / Deliverable Schedule:

Project Start .....	23 Dec 15 ✓
Stakeholder Meeting .....	17 Mar 16 ✓
Minimum Underway Hours for 87' Patrol Boat Training/Drills Brief.....	Sep 16
Aviation Minimum Flight Hours for Crew Proficiency Brief.....	Jan 17
★ <b>Minimum Underway Time for Training/Drills to Develop and Maintain Cutter Crew Proficiency.....</b>	<b>Oct 17</b>
★ <b>Development and Maintenance of Cutter Crew Proficiency: Alternatives to Underway Training and Drills.....</b>	<b>Sep 18</b>
Key Decision Point (KDP): Follow-On FY19 Work.....	Sep 18
Project End.....	TBD

**Sponsor:** CG-751  
**Stakeholder(s):** DCO-81, LANT, PAC, FORCECOM, CG-1B

<b>Project #:</b> 8204	<b>Expected Benefit:</b> Improved Doctrine/CONOPs/TTPs
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## Notes:

- Leverage USN, USAF, and Canadian CG practices.
- Supports the Coast Guard Human Capital Strategy.
- Partnership with Coast Guard Academy and Afloat Training Organization.

**RDC POC:**  
Dr. Anita Rothblum

**CG-926 Domain Lead:**  
LT Steve Hager

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★ Indicates RDC product.

# University Research Partnership

**Mission Need: Leverage University research to further CG missions.**

## Project Objectives:

Develop compilation documents for university research. Examples of current research include:

- University of Southern California (USC): Continue developing Economic-Consequence Analysis Tool. Identify threats and vulnerabilities; consider modeling and simulation to understand impacts in the Maritime Transportation System (MTS).
- USC: Threats and Vulnerabilities Using Game Theory.
- American Military University (AMU): Risk assessment for ports, facilities and vessels.
- University of San Diego (USD): Self evaluation of safety and security postures by port operators and vessel owners within the MTS.



## Key Milestone / Deliverable Schedule:

Project Start.....	29 Jun 16 ✓
★ <b>University Research Summary FY16 Q3&amp;4.....</b>	<b>Oct 16</b>
University of North Carolina Maritime Risk Symposium on Cyber Strategy.....	Nov 16
★ <b>University Research Summary FY17 Q1&amp;2.....</b>	<b>Apr 17</b>
★ <b>University Research Summary FY17 Q3&amp;4.....</b>	<b>Nov 17</b>
★ <b>University Research Summary FY18 Q1&amp;2.....</b>	<b>Jun 18</b>
<b>University Research Summary FY18 Q3&amp;4.....</b>	<b>Dec 18</b>
Project End.....	Jan 19

**Sponsor:** CG-926

**Stakeholder(s):** DHS S&T, CG CYBERCOM, LANT/PAC

<b>Project #:</b> 8601	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency.
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### Notes:

- Partner with universities (i.e., AMU, USC, USD).
- Partner with Army Research Office.

**RDC POC:**  
LT Keely Higbie

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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

★ Indicates RDC product.



**Acquisition Directorate**  
**Research & Development Center**

# Transition, Innovation, and Analysis (TIA) Branch Support

**Mission Need:** Maintain RDC Branch competency and knowledge, provide rapid response, and provide external liaison.

## Project Objectives:

- Maintain and enhance Branch competencies
  - Staff roles include: Human Systems Integration, Acquisition Analysis, Cost Modeling, and Risk Analysis subject matter experts.
- Provide CG-9 a core competency for analysis approaches that increase efficacy and efficiency for acquisition decision-making.
- Manage the CG Science and Technology Innovation Center quest for improved transition likelihood.
- Collaborate with the instantiation of the revised CG Innovation program.



## Key Milestone / Deliverable Schedule:

Project Start .....	3 Dec 07 ✓
Strategic Project Portfolio Alignment .....	5 Nov 15 ✓
Science & Technology Innovation Center Full Operational Capability Memo.....	31 Dec 15 ✓
FY18-19 Idea Submission Review.....	Nov 16
Annual Maritime Risk Symposium.....	Nov 16
★ <b>REACT: Literature Review and Analysis of Insurance/Banking Risk Practices and Methodologies Which Could be Applied to the Coast Guard.....</b>	<b>Dec 16</b>
FY18 Assessment of Prospective Portfolio.....	Feb 17
New Project Execution Plans/Proposals.....	As Required
Conduct Market Research.....	As Required
Technology Conferences.....	As Required
Project End .....	TBD

**Sponsor:** CG-926

**Stakeholder(s):**

<b>Project #:</b> 9995	<b>Expected Benefit:</b> Add to general R&D knowledge base
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**Notes:**

**RDC POC:**  
Mr. Tim Hughes

**CG-926 Domain Lead:**  
LT Steve Hager

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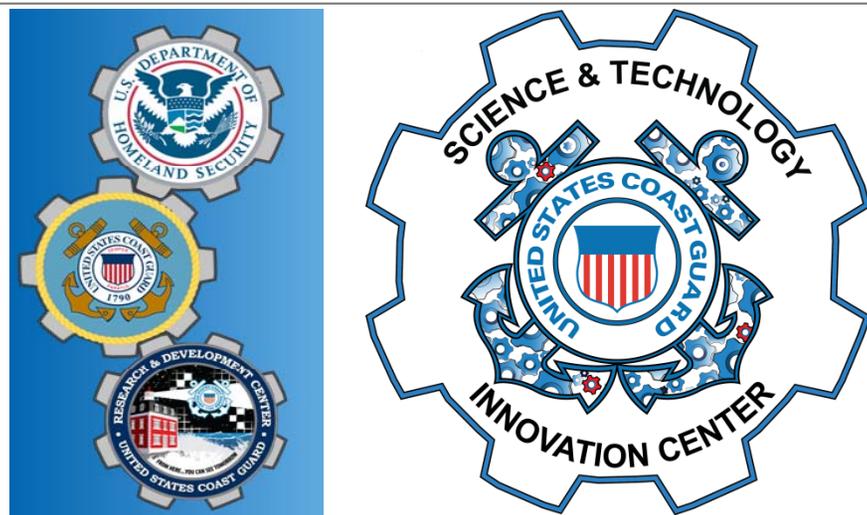
★ Indicates RDC product.

# Coast Guard Science & Technology Innovation Center (CG-STIC)

**Mission Need:** Increase the unity of effort, share knowledge, create a culture of innovation and transition technology to end-users.

## Project Objectives:

- Establish a collaborative relationship between the U.S. Coast Guard's Research and Development Test and Evaluation (RDT&E) Program Office and the Department of Homeland Security (DHS) Science & Technology (S&T) Directorate 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.
- Evaluate/validate Coast Guard requirements for CG-STIC technologies.
- Deploy new technology meeting CG-STIC exit criteria to the field as quickly as possible.



## Key Milestone / Deliverable Schedule:

Project Start.....	21 Jul 15 ✓
Determine Staffing Requirements .....	19 Aug 15 ✓
Draft Plan of Actions and Milestones.....	17 Sep 15 ✓
Initial Operating Capability.....	30 Sep 15 ✓
Draft Standard Operating Procedure.....	6 Oct 15 ✓
Identify Initial Projects .....	14 Oct 15 ✓
Establish Funding Stream .....	4 Jan 16 ✓
Initial Projects Underway .....	4 Jan 16 ✓
Fully Staffed (RDC).....	Aug 16
Full Operational Capability.....	Sep 16
Execute Task 001 and Task 002 Projects.....	Jul 17
Project End.....	TBD

**Sponsor:** CG-926, DHS Research Development Partnerships

**Stakeholder(s):** DHS S&T, Homeland Security Enterprise, CG-7

<b>Project #:</b> 99952	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Supports the Coast Guard Western Hemisphere Strategy.
- Align with DHS S&T Integrated Project Team gaps and prioritize.

**RDC POC:**  
Dr. Andrew Niccolai

**CG-926 Domain Lead:**  
Ms. Wendy Chaves

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★ Indicates RDC product.



**Acquisition Directorate**  
**Research & Development Center**

# Science & Technology Innovation Center (CG-STIC) Tasks

## Purpose:

To establish a collaborative relationship between the U.S. Coast Guard Innovation Center and the Department of Homeland Security Science and Technology Directorate to share and advance technologies that will be mutually beneficial to both parties.

## FY17 Efforts:

Task	Title	Objective	Office Supported	Funding Type	RDC POC	CG-926 Domain Lead	Due/Delivery Date
99952001	<b>Maritime Object Tracking Technology</b>	<i>Maritime Object Tracking Technology enabling CG assets to increase tracking precision while decreasing detection time to re-acquire objects of interest in a maritime environment. MOTT design, prototypes, technical data package and TTPs will be available go into the homeland security enterprise.</i>	CG-5R	DHS S&T	Dr. Andrew Niccolai	Ms. Wendy Chaves	Feb 2017

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



# Short Term Analytical Support Efforts (REACT Reports)

## Purpose:

Provide short term analytical support to CG decision makers with a means to access quick, inexpensive analyses to investigate a wide range of technology issues relating to current or planned CG operations or procurements. Larger analytical support projects will typically require funding to cover the cost of RDC labor & overhead and other direct costs.

## FY17 Efforts:

Branch	Title	Objective	Office Supported	RDC POC	CG-926 Domain Lead	Due/Delivery Date
TIA	<b>Literature Review and Analysis of Insurance/Banking Risk Practices and Methodologies Which Could be Applied to the Coast Guard</b>	<i>Research currently-employed insurance risk techniques that can be applied to USCG risk analysis and decision making, including application to risk decision-making in maritime cyber issues.</i>	CG-5R	Mr. Timothy Hughes	LT Steve Hager	Dec 2016
Surface	<b>Stand-off Chemical Threat Detector</b>	<i>Improved stand-off detection capability when responding to accidental or intentional release of hazardous chemical agents.</i>	CG-721	Mr. Rich Hansen	LT Steve Hager	Mar 2017

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





# Acquisition Directorate

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## Research, Development, Test & Evaluation

# FY17 Project Portfolio



# Non-CG RDT&E Funded Projects



# Non-Compliant Vessel Less-Than-Lethal Technologies Procurement Support

**Mission Need:** Capability to provide security and enforce maritime law with less-than-lethal technology.

## Project Objectives:

- Provide Coast Guard operators additional tools for the Use of Force continuum's Step II (Warn), Step III (Disrupt), and Step IV (Disable) tactics.
- Assist in the development of Non-Major Acquisition paperwork documenting the Less than Lethal Technologies that are all applicable to all Coast Guard missions and the maritime environment.



## Key Milestone / Deliverable Schedule:

Project Start.....	26 Jun 15 ✓
★ Acquisition Document 1: MNS Memo.....	13 Jan 16 ✓
★ Acquisition Document 2: PM Charter .....	Aug 16
GO/NO GO Decision Point to Continue .....	Apr 17
★ Acquisition Document 3: Requirements Document.....	May 17
Additional Documentation to be Determined after Decision Point (+2 years)	
Project End.....	Apr 19

**Sponsor:** CG-721

**Stakeholder(s):** MSST, MSRT, LANT, PAC, JTF-E

<b>Project #:</b> 5677	<b>Expected Benefit:</b> Inform follow-on acquisition/enterprise deployment
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### Notes:

- Leverage past work, Other government Agency's efforts, and other current Non-Compliant Vessel projects.
- Supports the Coast Guard Western Hemisphere Strategy.

**RDC POC:**  
Ms. D.J. Hastings

**CG-926 Domain Lead:**  
LT Steve Hager

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★ Indicates RDC product.

# Polar Icebreaker Acquisition Support

**Mission Need: Acquire a new polar icebreaking capability.**

## Project Objectives:

Prepare acquisition support documents including:

- Preliminary Operational Requirements Document (P-ORD).
- Operational Requirements Document (ORD).
- Alternatives Analysis (AA).



## Key Milestone / Deliverable Schedule:

Project Start.....	13 May 13 ✓
AA Study Plan Review .....	17 Jun 14 ✓
★ <b>AA Study Plan</b> .....	<b>12 Dec 14 ✓</b>
★ <b>P-ORD</b> .....	<b>6 Jan 15 ✓</b>
★ <b>AA</b> .....	<b>20 May 15 ✓</b>
Begin ORD Clearance .....	24 Aug 15 ✓
★ <b>ORD</b> .....	<b>31 Aug 15 ✓</b>
★ <b>Analysis of Operational Requirements</b> .....	<b>13 Jan 16 ✓</b>
★ <b>AA Refresh</b> .....	<b>Nov 16</b>
Project End.....	Dec 16

★ Indicates RDC product.

<b>Sponsor:</b> CG-932	
<b>Stakeholder(s):</b> CG-751, PAC-3	
<b>Project #:</b> 7930	<b>Expected Benefit:</b> Direct Acquisition Support (MAR, MNS, CONOPS, ORD, AA, LCCE, T&E, etc.)
<b>Notes:</b> • ORD completed USCG clearance in December 2015.	
<b>RDC POC:</b> Mr. Mark VanHaverbeke	<b>CG-926 Domain Lead:</b> LT Steve Hager
<i>For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil</i>	

# General Engineering Laboratory Support (GELS)

**Mission Need: Test and Evaluation of Aids to Navigation (AtoN) to improve performance, lower costs and extend maintenance intervals.**

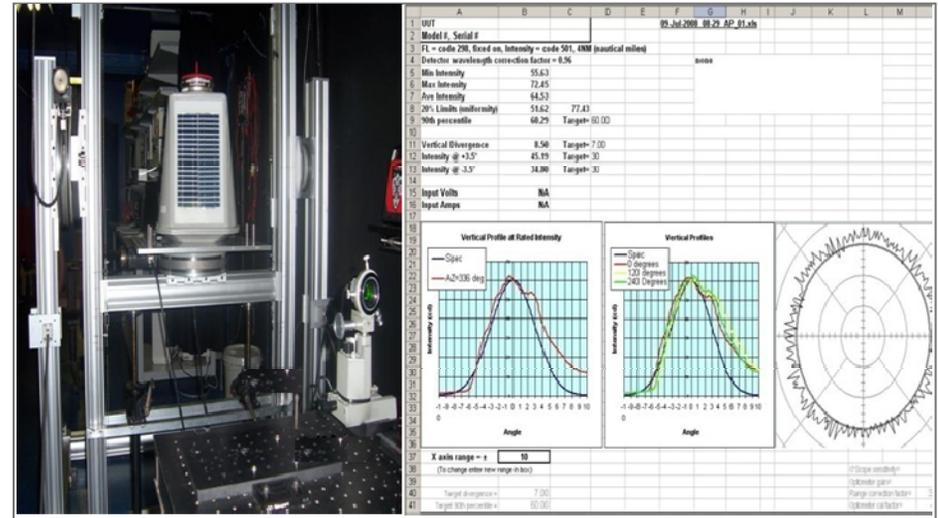
## Project Objectives:

- Provide a laboratory and test and evaluation services in support of the CG AtoN program.
- Conduct test and evaluation of AtoN to ascertain conformance with established regulatory and certification criteria.
- Evaluate the viability of emerging technologies to reduce CG operating/maintenance costs or alleviate (AtoN signal) problem areas.
- Assimilate geographic and environmental modeling capability into GELS for appropriate sizing of lights and support equipment.
- Update and document solar sizing programs.

## Key Milestone / Deliverable Schedule:

Project Start.....	circa 72 ✓
★ <b>Ongoing Project, Historically 2-3 Deliverables/Year</b>	✓
★ <b>GELS FY15 Activity Summary 1st and 2nd Qtr .....</b>	<b>13 Apr 15 ✓</b>
★ <b>GELS FY15 Activity Summary 3rd and 4th Qtr .....</b>	<b>12 Oct 15 ✓</b>
★ <b>GELS FY16 Activity Summary 1st and 2nd Qtr .....</b>	<b>6 Apr 16 ✓</b>
★ <b>GELS FY16 Activity Summary 3rd and 4th Qtr .....</b>	<b>Oct 16</b>
★ <b>GELS FY17 Activity Summary 1st and 2nd Qtr .....</b>	<b>Apr 17</b>
★ <b>GELS FY17 Activity Summary 3rd and 4th Qtr .....</b>	<b>Oct 17</b>
Project End.....	TBD

★ Indicates RDC product.



**Sponsor:** CG-43

**Stakeholder(s):** SILC Miami

<b>Project #:</b> 2784	<b>Expected Benefit:</b> Direct Product Line/Core Technology Support (Tech refresh, DMS, etc)
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## Notes:

- Use of RDC's Light Evaluation Laboratory capable of measuring light intensity and chromaticity.

<b>RDC POC:</b> Mr. Vinnie Reubelt	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
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*For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil*

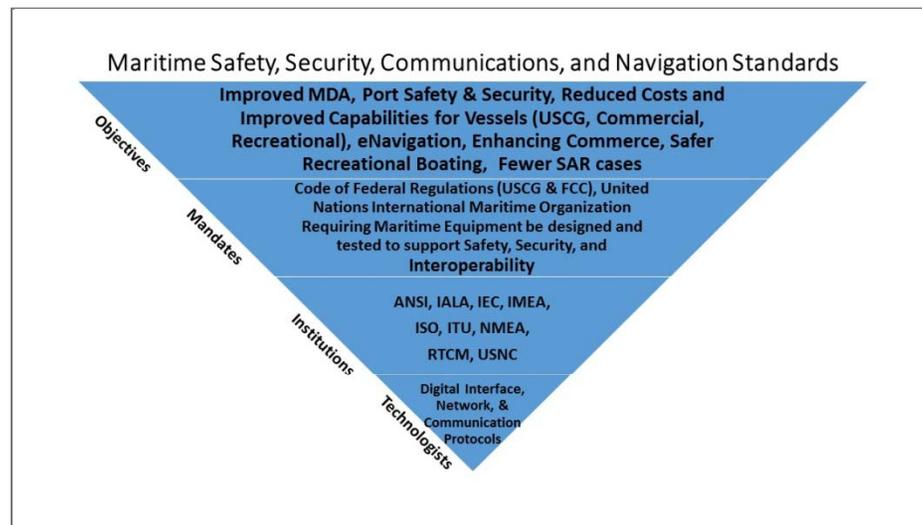


# Maritime Safety, Security, Communication, and Navigation Standards

Mission Need: Development and advancement of national and international standards effecting USCG interests.

## Project Objectives:

- To preserve the integrity of existing, and support the development and advancement of national and international standards effecting USCG interests – through participation in standards committee meetings.



## Key Milestone / Deliverable Schedule:

Project Start.....	1 Oct 2015 ✓
IEC TC80 WG17 CMDS Standards Meetings (3) .....	Sep 17
IEC TC80 WG6 Interface Standards Meetings (3) .....	Sep 17
IEC TC80 WG15 AIS Standards Meetings (5) .....	Sep 17
NMEA 0183 Interface Standard Meetings (3) .....	Sep 17
NMEA 2000 Interface Standard Meetings (5) .....	Sep 17
NMEA OneNet Interface Standard Meetings (8) .....	Sep 17
RTCM Special Committee Standards Meetings (10) .....	Sep 17
GMDSS Task Force Meetings (1) .....	Sep 17
★ <b>Inputs to NMEA 0183/2000/OneNet Standards.....</b>	<b>Sep 17</b>
★ <b>Inputs IEC Interface Standards &amp;, AIS Standards.....</b>	<b>Sep 17</b>
★ <b>U.S. National Committee Support.....</b>	<b>Sep 17</b>
Project End.....	<b>Sep 17</b>

★ Indicates RDC product.

**Sponsor:** C4IT SC

**Stakeholder(s):** CG-65, CG-761, CG-NAV, C3CEN

<b>Project #:</b> 7205	<b>Expected Benefit:</b> Influence international standards
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### Notes:

- Supports the Coast Guard Cyber Strategy.

**RDC POC:**  
Mr. Lee Luft

**CG-926 Domain Lead:**  
Ms. Holly Wendelin

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# Shipboard Compliance of Ballast Water Discharge Standards (BWDS)

**Mission Need:** The tools to quickly and reliably determine vessel compliance with the BWDS.

## Project Objectives:

- Determine the availability and capabilities of existing technologies that could be utilized for compliance verification of the BWDS.



## Key Milestone / Deliverable Schedule:

Project Start .....	12 Jan 11 ✓
★ <b>Proceedings of Ballast Water Discharge Standards Compliance SME Workshop.....</b>	<b>7 Sep 11 ✓</b>
★ <b>Market Research Assessment: Verification Technologies for BWDS Compliance.....</b>	<b>17 Oct 12 ✓</b>
Prototype Development of Compliance Tools.....	15 Jul 16 ✓
★ <b>Independent Field Testing of Prototype Compliance Verification Technologies.....</b>	<b>Feb 17</b>
★ <b>Compliance Technology Transition Plan.....</b>	<b>May 18</b>
Project End.....	Jul 18

<b>Sponsor:</b> CG-OES	
<b>Stakeholder(s):</b> USEPA-GLNPO, CG-CVC	
<b>Project #:</b> 410131	<b>Expected Benefit:</b> Influence international standards
<b>Notes:</b> <ul style="list-style-type: none"> <li>• Funded by Great Lakes Restoration Initiative.</li> </ul>	
<b>RDC POC:</b> Ms. Gail Roderick	<b>CG-926 Domain Lead:</b> Mr. Shannon Jenkins
<i>For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil</i>	

★ Indicates RDC product.

# Analysis Support for the Mandated Periodic & Practicability Reviews of Ballast Water Standards

**Mission Need:** To determine the practicability of implementing Ballast Water Discharge Standards (BWDS) more stringent than the current standards.

## Project Objectives:

- Develop a plan for determining the practicability of implementing more stringent ballast water discharge standards.
- Conduct a practicability review that examines all aspects of the prevailing ballast water management program requirements, standards, and assess the program's effectiveness in preventing invasions.



## Key Milestone / Deliverable Schedule:

Project Start.....	28 Jan 13 ✓
Phase I: BWDS Practicability Planning Meeting.....	22 May 14 ✓
KDP: Conduct BWDS Practicability Review.....	13 Jun 14 ✓
★ <b>Recommendations for Evaluating Multiple Filters in Ballast Water Management Systems for U.S. Type Approval.....</b>	<b>7 May 15 ✓</b>
★ <b>Ballast Water Discharge Standards Practicability Review Plan.....</b>	<b>Sep 16</b>
★ <b>Practicability Review of Ballast Water Discharge Standards.....</b>	<b>Dec 16</b>
Project End.....	Feb 17

**Sponsor:** CG-OES  
**Stakeholder(s):** USEPA - GLNPO

<b>Project #:</b> 410133	<b>Expected Benefit:</b> Influence international standards
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## Notes:

- Funded by Great Lakes Restoration Initiative.

**RDC POC:**  
Ms. Gail Roderick

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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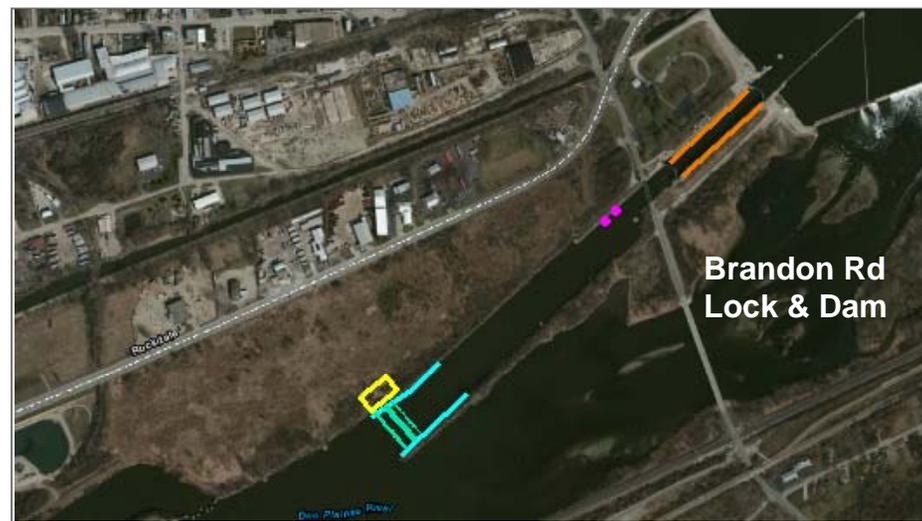
★ Indicates RDC product.

# Illinois Waterway Marine Safety Risk Research

**Mission Need: Provide technical support in determining marine safety risks; recommend mitigation strategies.**

## Project Objectives:

- Assist in developing appropriate safety tests for new Aquatic Nuisance Species control measures at Romeoville (Chicago Sanitary & Ship Canal CSSC) and Rockdale (Brandon Road Lock and Dam (BRLD)) Illinois.
- Participate in United States Army Corps of Engineers (USACE) prototype-related testing as CG technical lead.
- Analyze results and determine marine safety-related risks.
- Develop marine-safety risk assessment model and determine appropriate risk-mitigation measures.
- Make recommendations to CG operational commanders.



## Key Milestone / Deliverable Schedule:

Project Start.....	1 Jun 16 ✓
★ Preliminary Marine Safety Risk Assessment, Brandon Road Lock & Dam Invasive Species Control Measures.....	Dec 16
★ IL Waterway Barge Entrainment Control Measures; Prelim Risk Assessment.....	May 17
Participate in USACE Safety Testing (CSSC).....	Sep 17
★ CSSC Safety Testing Research Results and Analysis- New Barrier I.....	Dec 17
★ Brandon Road Lock and Dam Quantitative Marine Safety Risk Assessment.....	Feb 18
★ Barge Entrainment Quantitative Risk Assessment.....	Mar 18
Project End.....	Apr 18

★ Indicates RDC product.

**Sponsor:** USEPA-GLNPO, CGD9  
**Stakeholder(s):** MSU Chicago, CG SLM, USACE, LANT

<b>Project #:</b> 410136	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Project under Great Lakes Restoration Initiative/Great Lakes Mississippi River Interbasin Study.
- Supports the Coast Guard Energy Renaissance Initiative.

**RDC POC:**  
Mr. M. J. Lewandowski

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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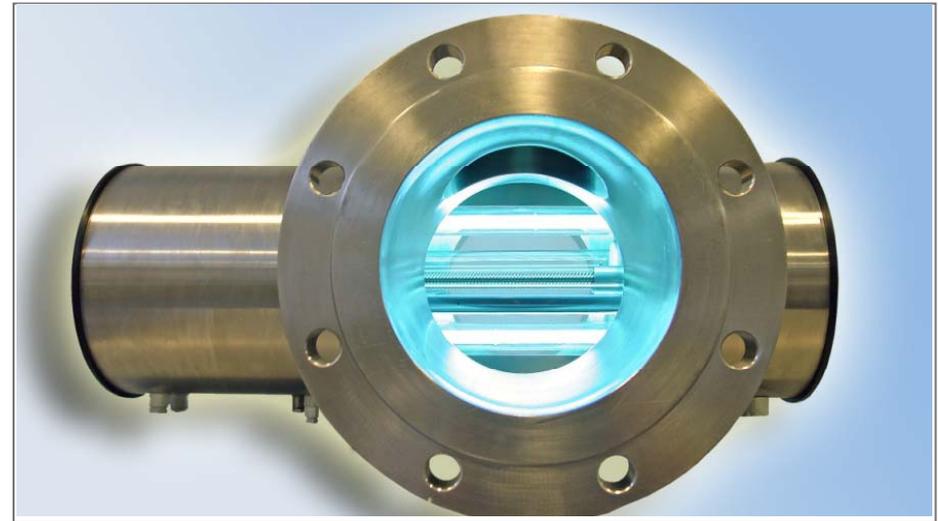


# Scalability of Ultraviolet-based Ballast Water Management Systems (BWMSs)

**Mission Need:** Research and study prevailing mathematical models that can be adequately used to interpolate or extrapolate data for common engineering designs of UV-based BWMSs in order to determine whether or not a USCG Type Approval should be granted.

## Project Objectives:

- Perform a literature research and review on mathematical models that may be used to predict the performance of common architectures of UV-based BWMSs:
  - Based on research, identify prevailing models currently in use that have the potential to predict the performance of a larger scaled UV-based BWMS through interpolation and extrapolation of data test results of a smaller sized UV-based BWMS.
  - Research, evaluate, and compile each model’s strengths/drawbacks and appropriateness for all common UV-based BWMS architectures.
- Develop Guidance Document for modeling UV-based BWMSs that will assist MSC in determining if a model proposed in its USCG Type Approval application is appropriate for the UV-based BWMS used.



## Key Milestone / Deliverable Schedule:

Project Start.....	23 Mar 16 ✓
Begin Literature Review.....	20 Jun 16 ✓
Literature Review Results.....	Dec 16
Begin Scalability Guidance Document Development.....	Dec 16
Interim Scalability Guidance Document.....	Mar 17
★ <b>Final Scalability Guidance Document.....</b>	<b>Jun 17</b>
Project End.....	Jul 17

**Sponsor:** MSC  
**Stakeholder(s):** CG-OES

<b>Project #:</b> 410145	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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**Notes:**

- Partnering with Great Lakes Restoration Initiative (GLRI) under the Clean Water Act 33 USC 1251-1387.

**RDC POC:**  
Mr. Alexander Balsley

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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e-mail RDC-Info@uscg.mil*

★ Indicates RDC product.

# Research and Development of Quality Assurance Protocols for Ballast Water Testing Independent Laboratories (IL)

**Mission Need:** USCG needs to assure that the ILs are meeting established scientific standards for Ballast Water Management Systems (BWMS) Type Approval.

## Project Objectives:

- Research how audit procedures and protocols are used by other Federal Agencies, Industry, and Academia to ensure Quality Assurance/ Quality Control (QA/QC) programs of contracted laboratories maintain a high standard of quality.
- Develop robust, science-based technical QA protocols that can be used as by the sponsor to verify the efficacy of ILs' QA/QC programs supporting BWMS type approval.
- Evaluate the QA protocols by auditing USCG-accepted laboratories and make minor adjustments as necessary.
- Document research activities and test results in a final report.



## Key Milestone / Deliverable Schedule:

Project Start.....	7 Jun 16 ✓
Literature Review .....	Mar 17
Subject Matter Experts Workshop.....	May 17
Initial QA Protocol Development.....	Aug 17
Initial Trial QA Protocol Test at Naval Research Laboratory...	Oct 17
Test at Non-US ILs.....	Apr 18
★ <b>Final Report and QA Protocols.....</b>	<b>Sep 18</b>
Project End.....	Sep 18

**Sponsor:** CG-ENG-3

**Stakeholder(s):** CG-OES-3

<b>Project #:</b> 410146	<b>Expected Benefit:</b> Improve operational performance/efficiency/mission execution/resiliency
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## Notes:

- Partnering with Great Lakes Restoration Initiative under the Clean Water Act 33 USC 1251-1387.
- Supports the Coast Guard Energy Renaissance Initiative.

**RDC POC:**  
Ms. Gail Roderick

**CG-926 Domain Lead:**  
Mr. Shannon Jenkins

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★ Indicates RDC product.