Domestic Nuclear Detection Office (DNDO)

AAPA
Port Security Seminar

West Coast Maritime Pilot & Dolphin Test

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DNDO Mission and Objectives

DNDO was founded on April 15, 2005 with the signing of NSPD 43 / HSPD 14. It is a jointly-staffed, national office established to improve the Nation's capability to detect and report unauthorized attempts to import, possess, store, develop, or transport nuclear or radiological material for use against the Nation, and to further enhance this capability over time.

- Develop the global nuclear detection and reporting architecture
- Develop, acquire, and support the domestic nuclear detection and reporting system
- Characterize detector system performance before deployment
- Establish situational awareness through information sharing and analysis
- Establish operational protocols to ensure detection leads to effective response
- Conduct a transformational research and development program
- Provide centralized planning, integration, and advancement of USG nuclear forensics programs

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DNDO: An Interagency Office

- DNDO is an interagency office comprised of detailees and liaisons from:
  - Department of Energy
  - Department of Defense
  - Department of Justice/Federal Bureau of Investigation
  - Department of State
  - Nuclear Regulatory Commission

- DNDO also works with and has detailees from other DHS components such as the U.S. Coast Guard, Customs and Border Protection, and Transportation Security Administration.
- The National Labs, academia, and private industry conduct research that directly supports the DNDO mission.
- DNDO maintains strong relationships with Federal, State, and local entities to help develop and deploy the domestic nuclear architecture.

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West Coast Maritime Pilot

Puget Sound Operating Area

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West Coast Maritime Pilot

- 3-year program (starting in FY08) to design, field & evaluate a layered preventive radiological / nuclear detection (PRND) capability for participating public safety agencies to counter the small vessel risk.
- Coordinated through Area Maritime Security Committees (AMSCs) in Puget Sound, Washington and San Diego, California.
- Pilot lessons learned will be applied to other U.S. ports.
- Goals:
  - Provide radiation detection equipment and training to partner agencies; jointly develop cohesive, regional CONOPS and SOPs
  - Evaluate the operational utility and costs associated with an enhanced maritime PRND capability
  - Identify and interdict rad/nuc weapons or materials as far away as possible from critical infrastructure and populated areas, while having minimal impact on the law abiding boating community and small vessel operators.

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Stakeholder Agencies in WCMP

- West Coast Maritime Pilot is a cooperative effort between a wide variety of Federal, State, and Local agencies.

  (Note: these numbers are approximates)

  - 5 Federal Agencies
  - 2 National Laboratories
  - 9 State agencies
  - 22 Local and Tribal agencies
- This creates an excellent cross section of agencies at the Federal, State, local, and tribal levels.

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Common detection equipment

- DNDO procured & has provided Personal Radiation Detectors (PRDs) and Radioisotope IdentiFinder (RIIDs) as part of the pilot program for partner agencies
  - DOE / DHS teams will provide training on the use of this equipment
  - USCG / CBP personnel will retain existing equipment
- Data communications equipment will be provided to agencies, as required
- DNDO goal is to evaluate a vessel-mounted detector system in mid-2010
  - Working in coordination with an ongoing DNDO / SPAWAR systems testbed program
  - Plan is to provide 1 or 2 best in class mobile systems for evaluation in WCMP

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WCMP Personnel Training

- Participating agencies receive training provided by the DOE Counter Terrorism Operations Support (CTOS) program
- Course of instruction includes radiation concepts, safety principles, equipment usage and maintenance
- DNDO provides maritime-specific rad screening training
- National Lab. pilot team provides training on CONOPS and SOPs
- National Lab. RAP team provides HPGe detector training to HIRT
- Multiple drill sessions are scheduled to validate training

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Critical Operational Issues and Deliverables

- Significant Critical Operational Issues (COIs)
  - Can the selected PRND systems be integrated into existing ops w/o impacting an agency's primary missions?
  - Can rad/nuc alerts be adjudicated within a reasonable period of time?
  - Can equipment provided by the pilot be sustained by partner agencies?
- Operational Utility Assessment (OUA)
  - Documents results of technical and operational assessments
  - Identifies any operational deficiencies, need for technology improvements
  - Draws conclusions about system utility, feasibility of/considerations for applying PRND approach to other ports
- Business Case Analysis (BCA)
  - Identifies costs associated with fielding the PRND capability
  - Provides insight into the costs of fielding similar capabilities at other ports

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Typical WCMP Process

- Formation of a Stakeholder (Federal, State, and Local) Ad Hoc working group under the Area Maritime Security Committee
- Concept of Operations (CONOPS) Workshop
- Detection Equipment Rodeo
- Public outreach tri-fold brochure
- Equipment Training
- SOPs approval
- Drills
- Functional Exercise
- Full Scale Exercise
- Boat-mounted system selection
- Training/Drills
- Boat-mounted system Op Demo
- Final Report

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WCMP Initial Lessons Learned

- The regional AMSC is critical for interagency participation and success of the WCMP project.
- Standardizing detection equipment across partner agencies simplifies training, SOPs, response protocols, etc.
- Reliable, cost effective data communications systems are needed to efficiently engage onshore SMEs for alarm resolution.
- Regional maritime CONOPS and SOPs are critical due to complex issues of jurisdiction and authority, as well as the limited response assets available.
- The WCMP project has facilitated growth in maritime public safety community cooperation and interaction.

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Dolphin Test Campaign

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Dolphin Background

Increase the probability of detecting illicit radiological and nuclear material aboard small maritime vessels

- In 2007 there were approximately 13 million state-registered recreational small maritime vessels (<300 GT) in the United States (Source: *2007 USCG recreational boating statistics*).
- Approximately 12 million of those recreational vessels (92%) were 40 ft in length or less.
- Using the above statistics, it is assumed that, following the curve established by registered vessels, approximately 92% or more of the **unregistered** recreational small vessels will also measure < 40 ft.
- Baseline Maritime PRND CONOPS & TTPs require LE officers to conduct a boarding in order to detect radiological and nuclear threats on ALL small vessels regardless of size.
- By developing a **Standoff PRND capability** focused on screening recreational vessels of approximately 40 ft and less **without boarding**, users would buy down the RAD/NUC small vessel risk by greatly increasing the number of vessels screened in everyday operations.
- Boardings would still be required for small commercial vessels (*approximately 182,000 according to the DHS SVSS*) and recreational small vessels >40ft (*8% of all recreational vessels*).

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Test Purpose & Objectives

- To determine whether current variants of radiation detection systems mounted on law enforcement vessels are effective in the detection and identification of potentially illicit radiological or nuclear materials transported in small vessels when used in:
  - *an overtaking maritime law enforcement tactic/protocol.*
  - *a vessel stop/interview maritime law enforcement tactic/protocol.*

- To provide point estimates for the probability of detection, probability of identification, and probability of providing a false alarm for each radiation detection system tested in both the overtaking and vessel stop/interview tactics/protocols.

**all systems tested would require modification to support extended operations in the maritime environment.

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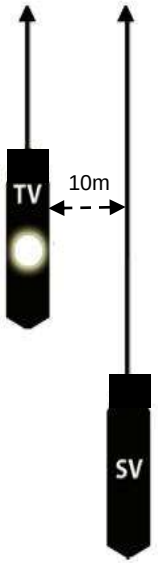
Overtaking Tactic

- **Scenario** - Standoff PRND system used during everyday operations in a lower MARSEC condition resulting in random encounters with recreational small vessels.

– **Tactic -** Approach vessel to a range of 10 meters at closest point of approach at a speed above that of the target vessel, but with a slower relative speed to optimize detection.

– **Advantage -** Provides for increased scanning of vessels during routine operations which maximizes the encounter rate. Speed provides better station keeping in a higher sea state, and distance of 10m allows for safe operations.

– **Disadvantage -** Increased distance and decreased integration time lowers probability of detection.



DOLPHIN TESTING CONDITIONS
Speed of Target: 5 kts
Speed of Scanning vessel :10 kts
Closest Point of Approach: 10 m

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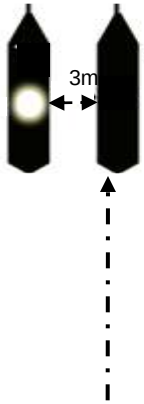
Vessel Stop/Interview Tactic

- **Scenario** - Standoff PRND system can be used in all MARSEC conditions to perform random scans or further investigate rad/nuc alarms.

– **Tactic -** Bring target vessel to slow speed or dead in the water, approach vessel to a range of 3 meters and stop. Interview vessel operator and initiate ID. When ID is completed, clear vessel.

– **Advantage -** Allows users to thoroughly screen vessels during focused operations and increased MARSEC levels. Longer dwell time provides better probability of detection and a increased ability to ID.

– **Disadvantage -** Stopping vessels to dwell takes more time and will lower the number of encounters.



DOLPHIN TESTING CONDITIONS
Relative Speed: 0 kts
Closest Point of Approach: 3 m
Dwell Time: 90 s

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Radiation Detection Systems

System Name	Class	Manufacturer	Vendor/Provider
Government-Off-the Shelf			
Multi Platform System (MPS) - Boat	Vessel-Integrated	SPAWAR	Transportation Security Administration (TSA)
MPS - Backpack	Mobile/Portable	SPAWAR	TSA
Smart Threads Integrated Radiation Sensors (STIRS) Manned Point Detection System (MPDS) – Backpack	Mobile/Portable	Nucsafe	DTRA
PackEye	Mobile/Portable	Thermo Fisher Scientific	New York state
RadPack	Mobile/Portable	Sensor Technology Engineering	USCG
U. K. Multi-Role System (MRS)	Mobile/Portable	Radiation Solutions	CWP-UK
Commercial Off-the-Shelf			
Modular Maritime Detector (MMD) System	Vessel-Integrated	Nucsafe	Nucsafe, Inc.
STRIDE™ Mobile Maritime Radiation Detection Systems	Mobile/Portable	ICx	ICx Radiation, Inc.
Matrix Maritime Radiation Identification and Detection System (MRIDS)	Mobile/Portable	Thermo Fisher Scientific	Thermo Eberline, Limited Liability Company (LCC)
Adaptable Radiation Area Monitor - Maritime (ARAM-M) (RadBoat)	Vessel-Integrated	Textron	Textron Defense Systems

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Alamar Boat Detection Systems

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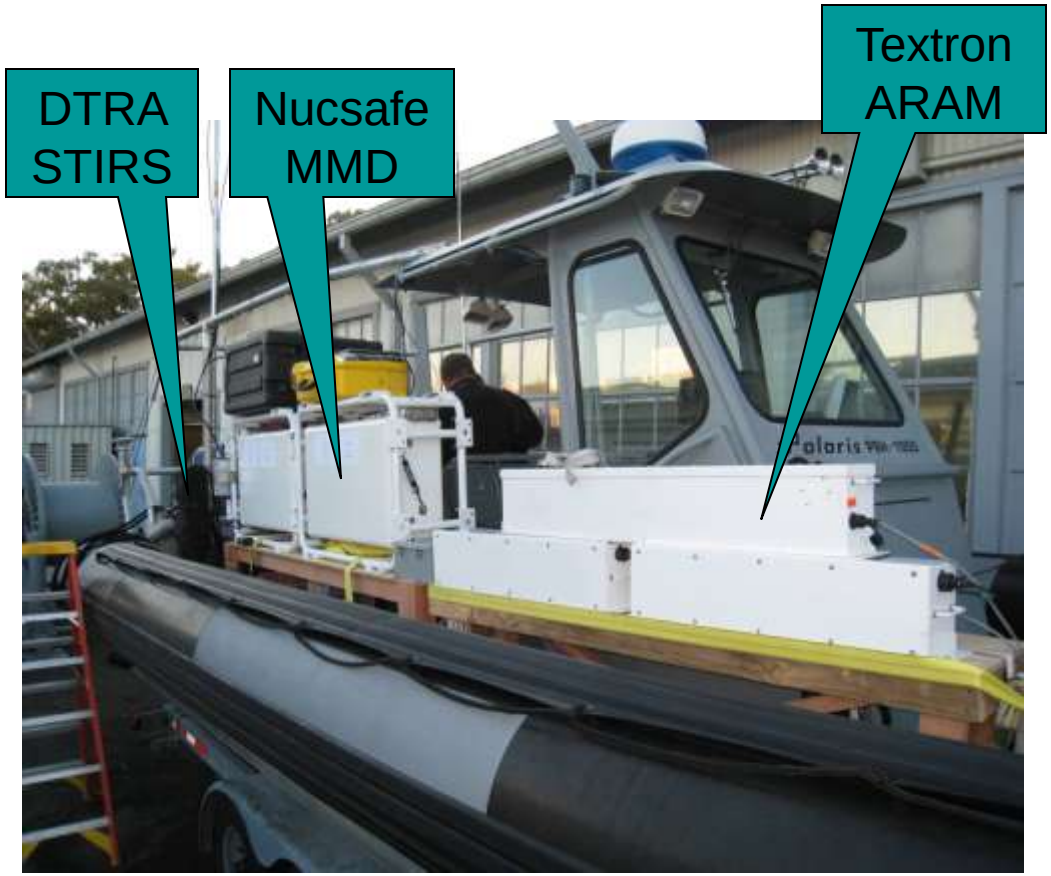
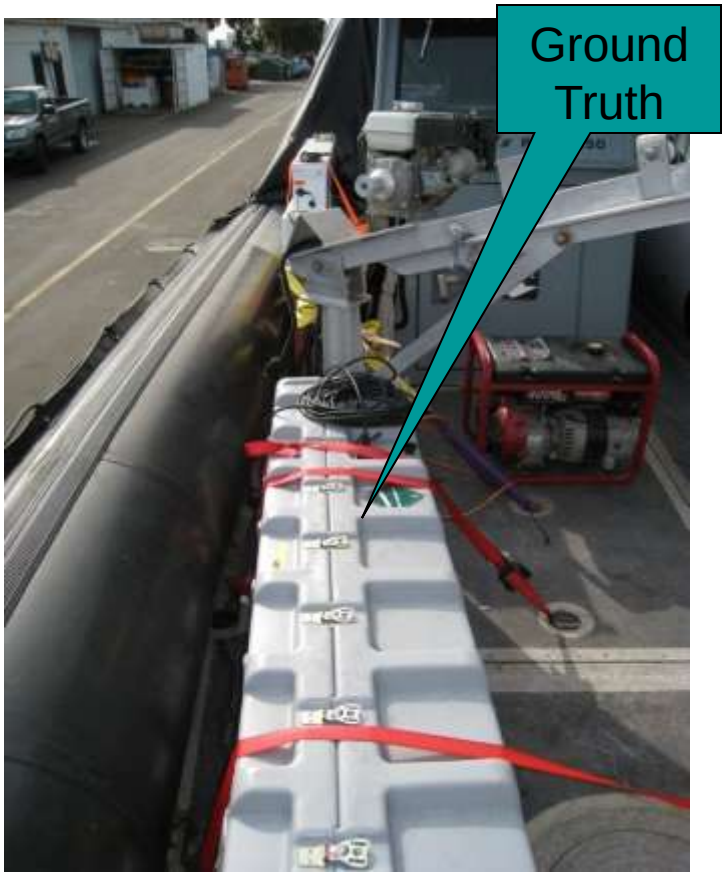
Polaris Boat Detection Systems





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Apex Boat Detection Systems

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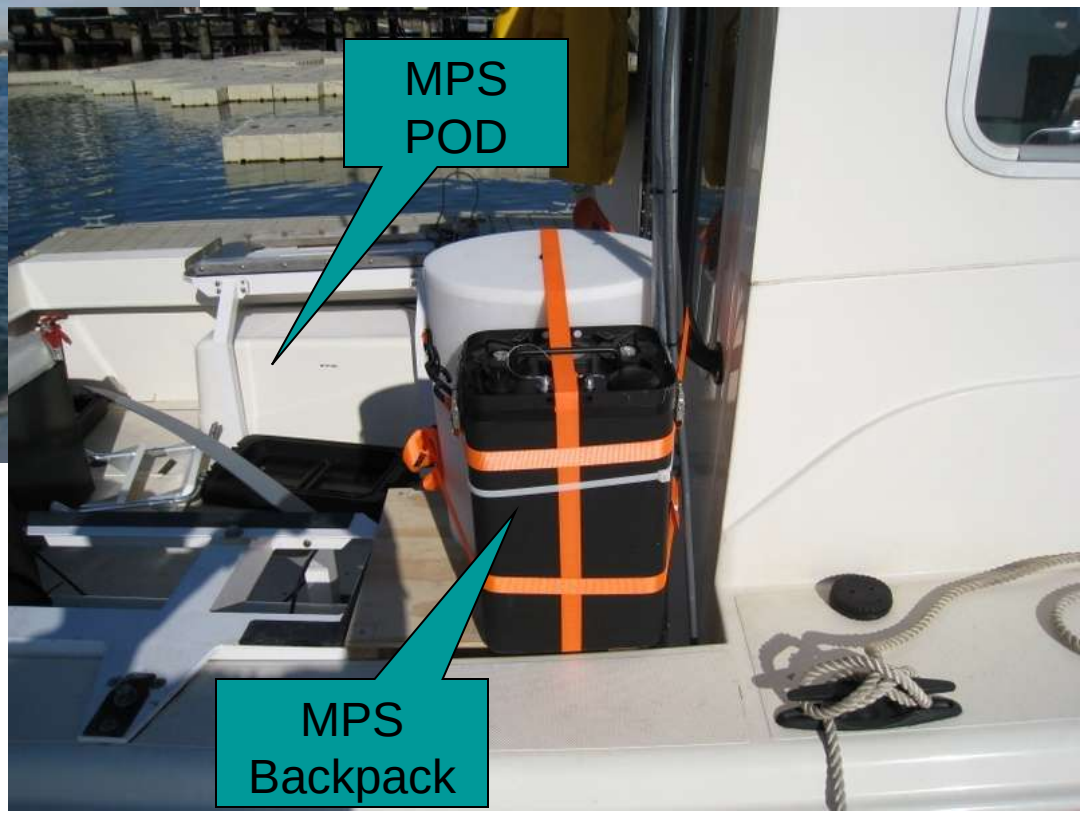
McKee Craft Detection Systems



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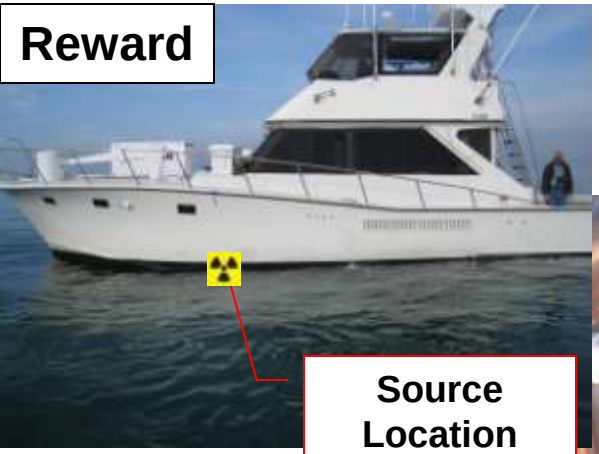
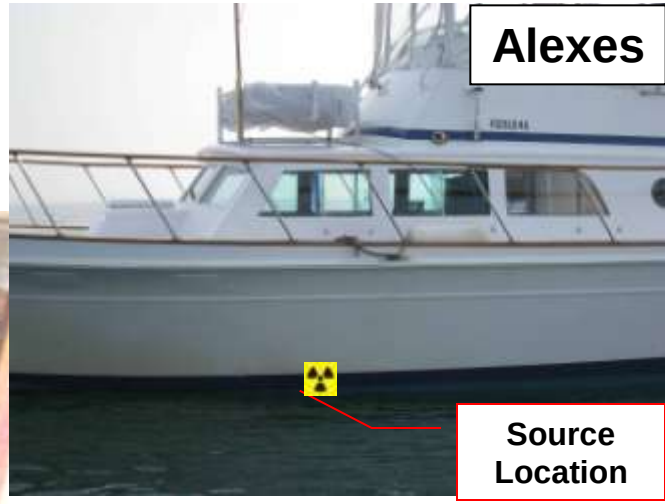
Source Boats

Reward



Source Location

Alexes

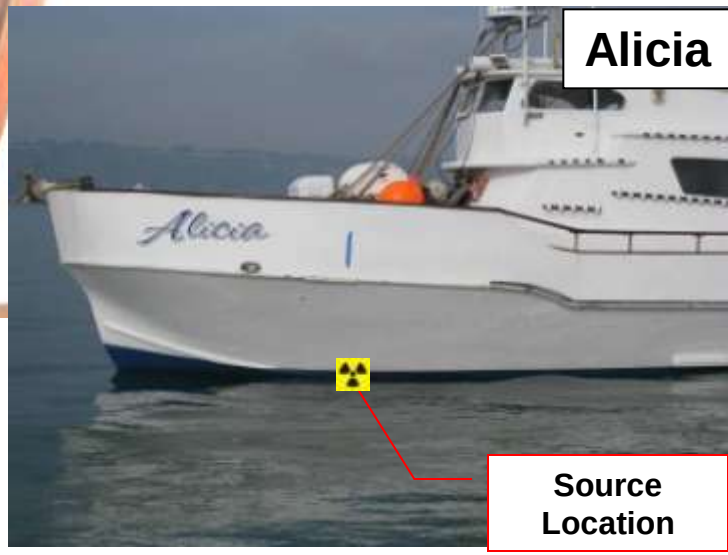


Source Location

Pacific Venture

Source Location

Alicia



Source Location

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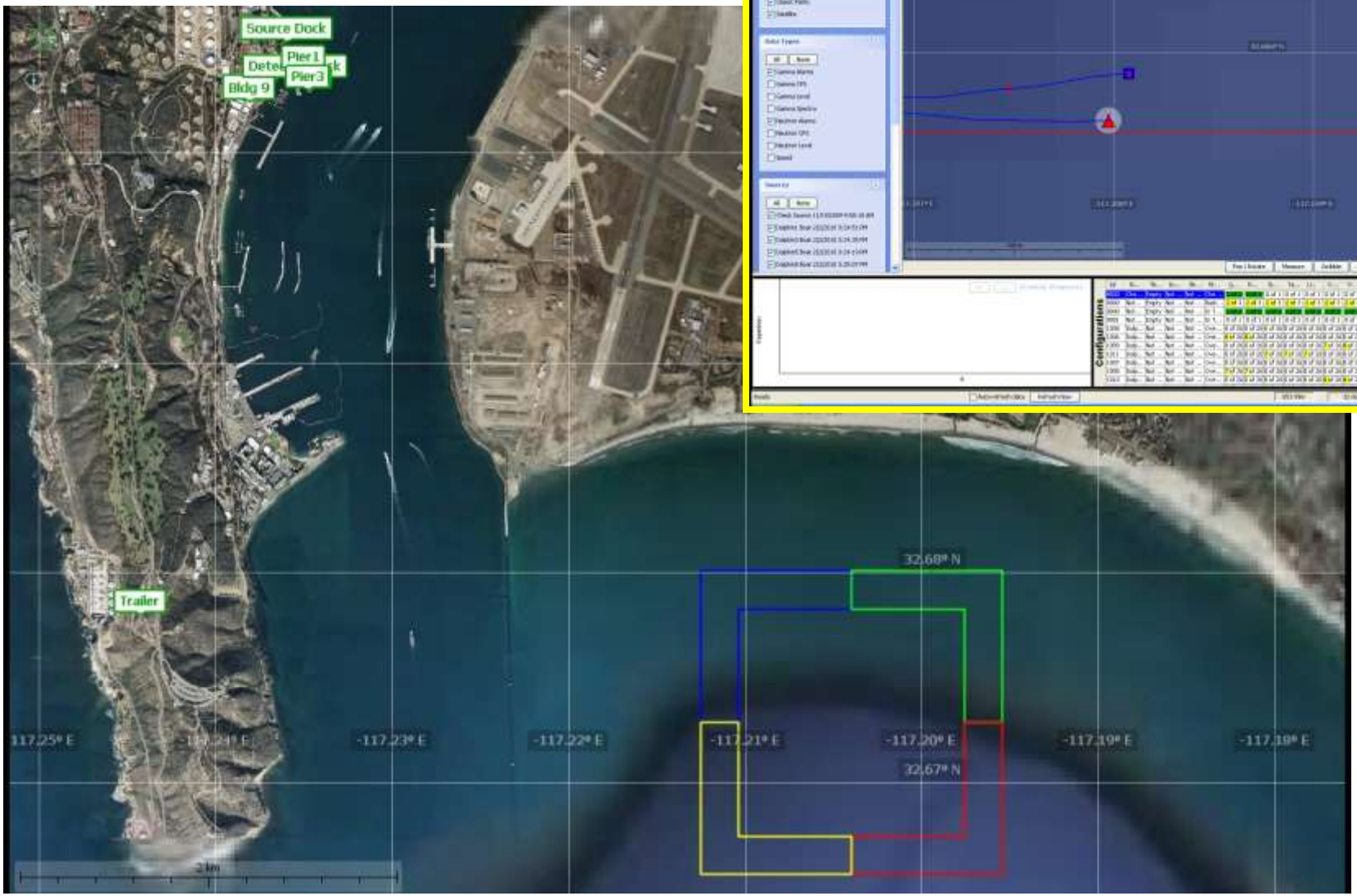
Test Bed Design



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Test Sources

Source	Category	Radionuclides
^{137}Cs	Industrial	^{137}Cs
^{60}Co	Industrial	^{60}Co
WGPu	SNM	^{239}Pu
HEU	SNM	^{235}U
DU	SNM	^{238}U
^{131}I	Medical	^{131}I
^{252}Cf	Neutron	^{252}Cf
No Source	NA	NA

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Preliminary Findings

- Final data analysis ongoing
- Quick look information indicates
  - Interview scenario
    - High confidence with ability to detect
    - Low/moderate confidence with ability to ID
  - Overtaking scenario
    - Low/moderate confidence with abiltiy to detect
    - Low confidence with ability to ID

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Questions

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