DHS Science & Technology Directorate

Maritime Security Science & Technology, Trends and Challenges

AAPA Port Security Seminar and Exposition
Miami, FL

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Anh Duong
Director
Borders & Maritime Security Division
Homeland Security Advanced Research Project Agency
Science & Technology Directorate
Mission

Strengthen America’s security and resiliency by providing knowledge products and innovative technology solutions for the Homeland Security Enterprise
U.S. Department of Homeland Security

SECRETARY

DEPUTY SECRETARY

Chief of Staff

Executive Secretariat

Military Advisor

MANAGEMENT
Under Secretary

Chief Financial Officer

SCIENCE & TECHNOLOGY
Under Secretary

NATIONAL PROTECTION & PROGRAMS
Under Secretary

POLICY
Assistant Secretary

GENERAL COUNSEL

LEGISLATIVE AFFAIRS
Assistant Secretary

PUBLIC AFFAIRS
Assistant Secretary

INSPECTOR GENERAL

HEALTH AFFAIRS
Assistant Secretary/Chief Medical Officer

INTELLIGENCE & ANALYSIS
Under Secretary*

OPERATIONS COORDINATION
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CITIZENSHIP & IMMIGRATION SERVICES
OMBUDSMAN

CHIEF PRIVACY OFFICER

CIVIL RIGHTS & CIVIL LIBERTIES
Officer

COUNTERNARCOTICS ENFORCEMENT
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FEDERAL LAW ENFORCEMENT TRAINING CENTER
Director

DOMESTIC NUCLEAR DETECTION OFFICE
Director

NATIONAL CYBER SECURITY CENTER
Director

TRANSPORTATION SECURITY ADMINISTRATION
Assistant Secretary/Administrator

U.S. CUSTOMS & BORDER PROTECTION
Commissioner

U.S. CITIZENSHIP & IMMIGRATION SERVICES
Director

U.S. IMMIGRATION & CUSTOMS ENFORCEMENT
Assistant Secretary

U.S. SECRET SERVICE
Director

FEDERAL EMERGENCY MANAGEMENT AGENCY
Administrator

U.S. COAST GUARD
Commandant

* Under Secretary for Intelligence & Analysis title created by Public Law 110-53, Aug. 3rd, 2007

Approved 3/20/2008
Provide technical knowledge and solutions that address DHS operational capability gaps in border, maritime, and cargo security

Two operational settings:
- Areas between Ports of Entry (POEs)
- At the POEs

All domains:
- Air
- Ground
- Underground
- Water
- Underwater
Federal, State & Local Common Goals

- Keeping U.S. ports secure and functioning
- Preventing disruptions due to terrorist activity
- Balancing throughput and security
- Preventing illegal activity
Maritime Security

Challenges:

- Persistent wide area surveillance for detecting, tracking and interdicting vessels that might carry illicit goods and people (potential conduit for WMD and other terrorist-related activities)

- Electronic monitoring of security exclusion zones surrounding critical infrastructure and or resources in U.S. ports and harbors and in U.S. coastal zones and beyond

Self-Propelled Semi-Submersible (SPSS)  

Fully Submersible Vessel (FSV)
Maritime Security

DHS S&T Goals:

- Create environment that enables data and information sharing
- Network existing open source databases and information services that provide DHS maritime components and first responders (national, regional, local) maritime situational awareness
- Develop/field new data and information sources (as necessary)
- Real time situational awareness via a common operating picture for DoD/DHS and other operational commands

Pictures of interdicted vessels
DHS S&T Current Efforts:

- Investing in Enhancing Maritime Domain Awareness (especially addressing small vessels, semi- and fully submersibles)
  - Creates new data fusion engine (Open Mongoose) for unclassified, law-enforcement sensitive data
  - Facilitating info sharing between DoD/DHS Intel fusion centers and other govt fusion centers
  - Networks USCG Vessel Traffic Services with national global vessel tracking systems
  - Creates new data sources on small vessels and submersibles
  - Tampa Bay and LA/LB Port Security Test Beds

- Engaging Nationally
  - DHS Small Vessel Security Strategy and Implementation Plan
  - Strong partnership with DOD, USCG and CBP (Office of Air & Marine)
  - Delivered new technologies to Joint Interagency Task Force - South

- Engaging Internationally
  - Canada (Beyond the Border Initiative)
  - NATO
Port Security Testbed
(Los Angeles/Long Beach)

Command Centers
- SCC LA (USCG)
- OFO (CBP)
- Port Authorities (LA & LB)
- AMOC (CBP)
- LA Emergency Ops Center (EOC)
- Joint Regional Intelligence Center (JRIC)
- CHP / State Police
- Local Police & Sheriff Dept
- Local Fire Dept including Lifeguards

Integrated Existing Sensors/Systems
- LA/LB Port Cameras
- LA/LB Port Radars
- VTS
- SCORE (Navy radars)
- AIS
- AMOC (Air Picture)
- Other State & Local (traffic, harbor pilots)
- Blue Force Tracking
- Electro-Optics / Infrared Camera
- Automated Scene Understanding

Potential Additional Systems to Integrate
- Open Mongoose (data fusion engine)
- Port and Coastal Radar
- Offshore Deepwater Buoy Sensor Network
- Offshore Wide Area Surveillance
- Underwater Swimmer / Diver Detection
- Underwater Mapping of Port & Harbor
- Next Generation Situational Awareness Visual Tools
- Next Generation Mission Planning Toolset
Cargo Security

DHS Science & Technology Current Efforts:

- **Investing mainly in Supply Chain Security**
  - Container Security Device (CSD)
  - Marine Asset Tag Tracking System (MATTs)
  - Electronic Chain-of-Custody Device
  - Hybrid Composite Container
  - Secure Transit Corridor Pilot
  - Maritime Cargo Security Pilot

- **Engaging Nationally**
  - Leading White House/National Security Staff Global Supply Chain Technology Working Group
  - Collaborating with DOS, DOD and DNI

- **Engaging Internationally**
  - Canada
  - European Union
  - Singapore
  - WCO
  - WSC
  - Shippers
  - Insurance Companies
Cargo Security

Challenges:

- Providing cargo security w/o impeding commerce
- Providing cargo security w/o undue costs
- Industry Acceptance of improved security measures
- Determining the return-on-investment of additional security measures

Where AAPA can help:

- Data and information to build business case
- Insight/advice to:
  - facilitate user acceptance
  - find Commercialization path
Pursuing a **Performance Specification** incorporating Open Standards and Open Architecture

**Key Features**

- Detection of door opening and door removal
- Sensor monitoring and notification through event logging and alarming
- Performance to maximize detection of door breaches while minimizing false alarms
- “Point of stuffing” to final destination monitoring
- Reliable and secure communications
- Seamless security data transition between industry and DHS systems
- Power Management
Secure Transit Corridors  
Technology Demonstration Project

**Description:**
- Demonstrate a rail and truck security device that will monitor unauthorized door openings or anomalies and provide encrypted in-transit tracking for C-TPAT* Tier III members supply chains routes originating from Mexico and Canada** and ending in the U.S.
- Joint effort with CBP

**Objective:**
- Increase conveyance security without impacting and potentially improving the flow of commerce

**Deliverables:**
- A leave-behind capability to operate four supply chain routes (three truck and one rail).
- Phased cost estimates for full-scale data server implementation and acquisition planning for 100 truck, and 34 rail Points of Entry (POEs) – will also provide estimates for 228 Maritime and Air POEs.
- Technical performance standards and test plans for certifying future ECoC-like devices from open market.

*Customs – Trade Partnership Against Terrorism, a voluntary importer based program to secure the supply chain of goods entering the United States.
**Coordinating with the Canada Border Services Agency (CBSA) at the Ambassador Bridge Detroit, MI Port of Entry.
Secure Transit Corridors

Creating a More Secure Supply Chain for Truck and Rail Conveyances…

…Using an Electronic Chain of Custody Security Device, a Multi-layered Approach to Conveyance Security
SAFECON: A Cargo Sniffer & Analyzer

Operational Considerations

- Single operator customized vehicle
- Self contained deployment
- Wireless communication of results to operator
- Operator is isolated from hazard
- No special licenses required
Other S&T Investments
Container Security Test Bed

- Located at Transportation Security Lab
- Crane and containers are fully instrumented
- Enables baseline testing and testing of sub-systems and prototypes in a relevant environment
- Can be used to demonstrate/evaluate a wide variety of approaches to improve container security
- Open access to industry and international partners
Doing Business with DHS S&T

- Contact DHS S&T - Phone: 202-254-6006; email: SandT@hq.dhs.gov
- [www.fedbizopps.gov](http://www.fedbizopps.gov) - Posts DHS S&T and all U.S. government business opportunities
- [https://baa2.st.dhs.gov](https://baa2.st.dhs.gov) - Solicitations Portal for Broad Agency Announcements that address needs of DHS S&T technical divisions
- [https://sbir2.st.dhs.gov](https://sbir2.st.dhs.gov) - SBIR Program for Small Businesses posts two solicitations annually seeking technical capabilities that cut across DHS S&T divisions
- [https://www.safetyact.gov](https://www.safetyact.gov) - SAFETY Act helps facilitate development and use of qualified anti-terrorism technologies by providing limited liability protection to manufacturers
- [www.firstresponder.gov](http://www.firstresponder.gov) – A collaborative environment for federal, state, local, and tribal first responders to access and leverage federal web services, information on resources, products, standards, testing and evaluation and best practices
- [www.dhs.gov](http://www.dhs.gov) search “SECURE” - SECURE program leverages private sector resources and expertise to develop solutions aligned with DHS operational requirements