

NDIA

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PUTTING FIRST RESPONDERS FIRST

► Explosives ► Chemical & Biological ► Command, Control & Interoperability
► Borders & Maritime Security ► Human Factors ► Infrastructure & Geophysical

SCIENCE AND TECHNOLOGY



LOS ANGELES CONVENTION CENTER • LOS ANGELES, CA

JANUARY 14-17, 2008
[HTTP://EVENTS.NDIA.ORG](http://events.ndia.org)
EVENT # 0800

EML Support to First Responders

Adam Hutter

Director

Environmental Measurements Laboratory

Science and Technology Directorate

Department of Homeland Security

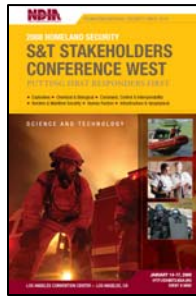
“Putting First Responders First”



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Science & Technology

EML Support to First Responders



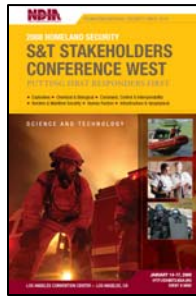
- EML Overview
- Programs Supporting First Responders:
 - Radiological Emergency Management System
 - New York Area Science & Technology Workgroup
 - System Assessment and Validation for Emergency Responders (SAVER)
 - Regional Reachback
 - Securing the Cities



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EML Vision

To be *S&T's laboratory* that *tests, evaluates, assesses and transitions technologies* with federal, state, local and private sector *customers*, especially in the New York City Metropolitan area, that meet *operational requirements* to conduct the homeland security mission.

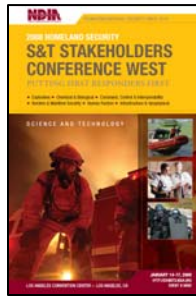


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EML Mission

EML will enable the use of the New York metropolitan area as an urban test bed:

- Operational Liaison - maintains communication between developers and operators
- Identify S&T Opportunities - enables operations to exploit emerging science and technology
- Technology Test and Evaluation Operations – federal staff provide independent test and evaluation in operating urban environments and supports data gathering for developmental programs with endusers
- Technology Insertion/Transfer - supports technology transition & provides technical support to operations

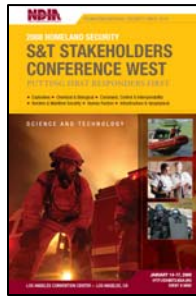


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Responder Support: T&E

Technology support to regional state and locals

- Trusted confidants providing objective non-conflicted expertise
- “Local” S&T feds
- Leverage existing partnerships for future S&T work



Field testing advanced technologies



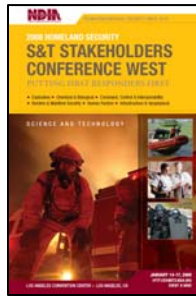
Tactics, Techniques, Procedures (TTPs) and Concept of Operations development and testing



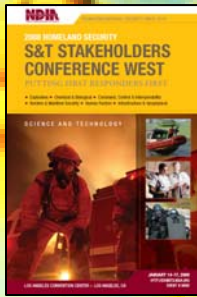
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EML Support to First Responders

- Radiological Emergency Management System
- New York Area Science & Technology Workgroup
- DHS/FEMA System Assessment and Validation for Emergency Responders (SAVER) Program support (New Start)
- Regional Reachback – on call 24/7 for data analyses
- Securing the Cities - Rad/Nuc SMEs



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Radiological Emergency Management System (REMS)

Lawrence A. Ruth, Ph.D.
Director (Acting) Systems Division
Environmental Measurements Laboratory
Science and Technology Directorate
Department of Homeland Security

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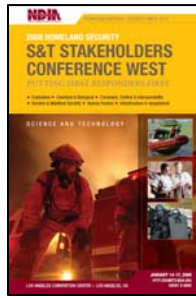


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Fixed Sensor Networks Help Ensure Effective Emergency Response

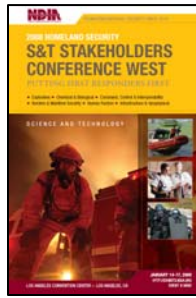


- *Single* picture of threat during time of weakest coordination
 - system in place, ready & operating before event
- Critical knowledge *before* responders enter attacked area
 - automatic data collection & transmission
- Timely information for public about potential radiation exposure
 - avoid panic & increase public cooperation
 - fewer “worried well”
- Reduced mortality & morbidity due to avoided exposure
 - better predict plume trajectory
 - data for evacuate vs. shelter-in-place decisions
- Reduced economic losses
 - mitigate psychological impacts
 - lower medical treatment costs & worker productivity loss



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Radiological Emergency Management System (REMS)



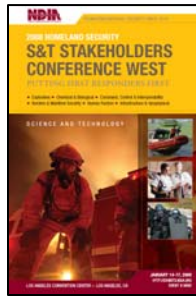
- Objective
 - Through systems analysis & pilot deployments, develop sensor networks that enhance radiological/nuclear incident management capabilities
- Approach
 - Partner with NYC OEM & other regional organizations
 - Establish pilot project in New York City area
 - Test & evaluate in operational environment
 - Support users for start-up & training
- Status
 - 4 sites operating
 - Real-time data transmitting 24/7 to OEM & RIJAN
 - Baseline evaluation complete
 - Major expansion planned with NYPD



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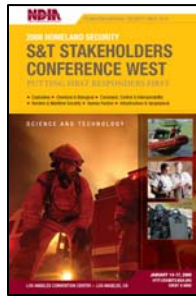
REMS - Sensor Module

Sensor module
on EML building
roof



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REMS - Sensor Module Interior



- NaI scintillator (3"x 3")
- Photomultiplier tube
- Multi-channel analyzer
 - digital MCA, power supply, preamplifier (Ortec digiBASE)
- Total radiation monitor
 - high exposure rates (5 mR/h to 500 R/h)
 - Canberra Radiac
- Embedded computer
- Fiberglass housing



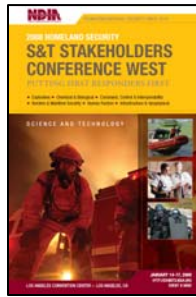
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GIS-Based Data Display (*example*)



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Gamma Spectrum (*typical*)



Isotope Identification

Reading at 1:54 PM

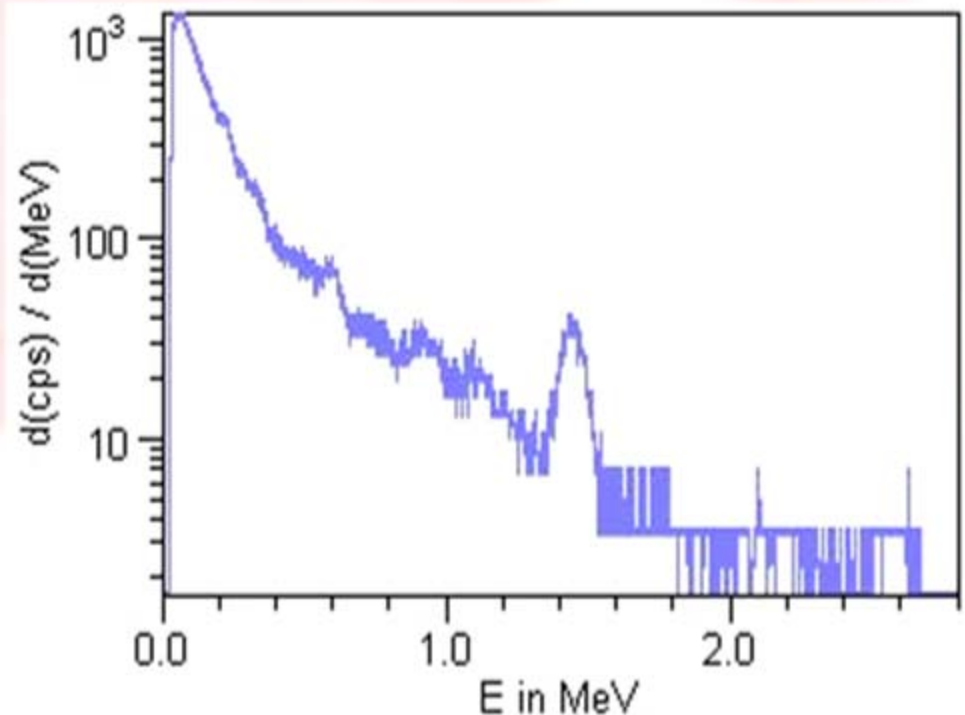
Count Rate: 232 s⁻¹

Estimated Exposure Rate: 7.0 μR/h

Nuclide	Level
Co-60	None Detected
Cs-137	None Detected
I-131	None Detected
Ir-192	None Detected

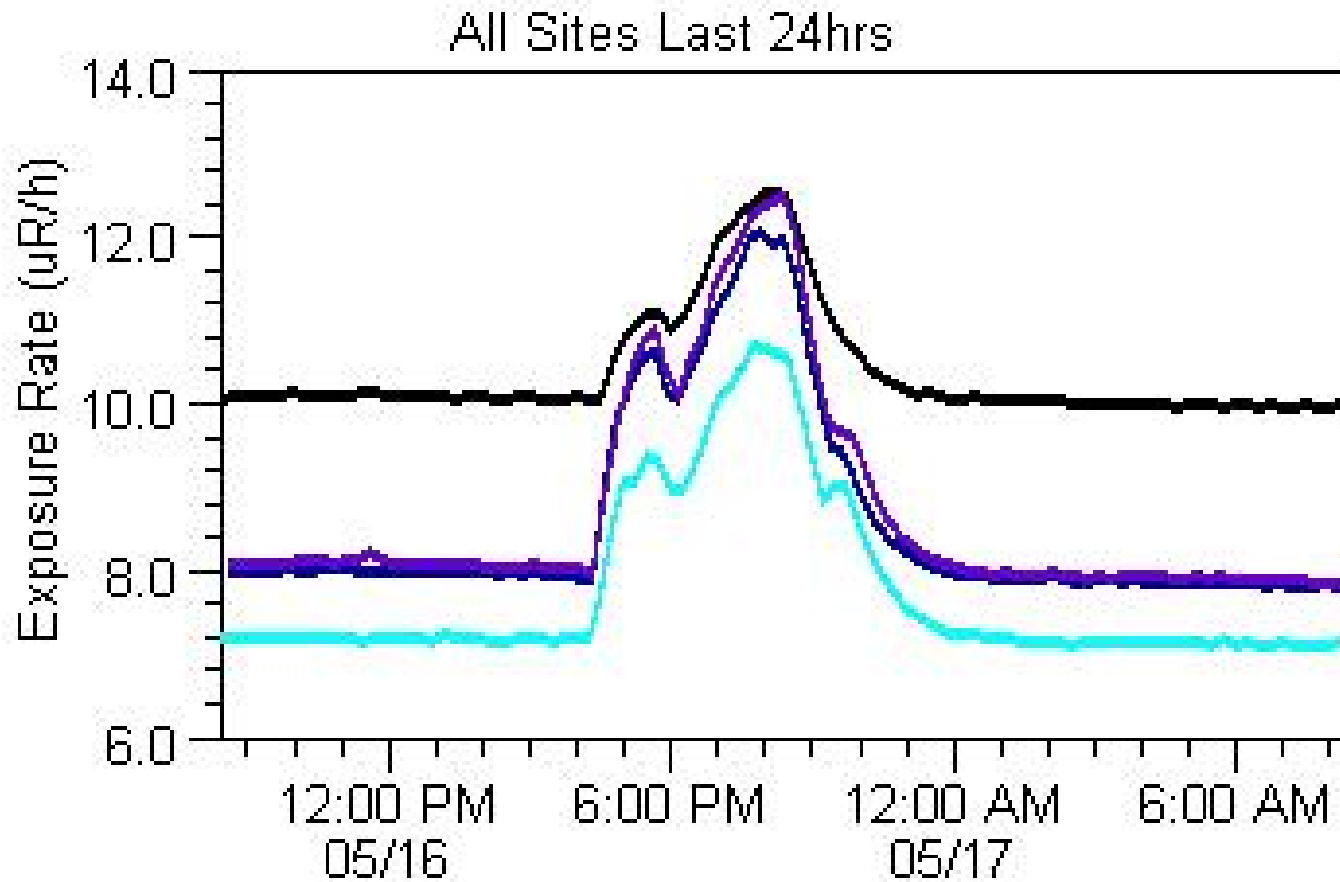
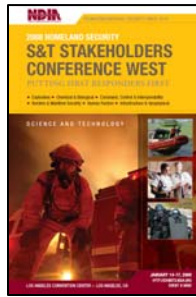
Natural Radioactivity after Precipitation

Pb-214	None Detected
Bi-214	None Detected



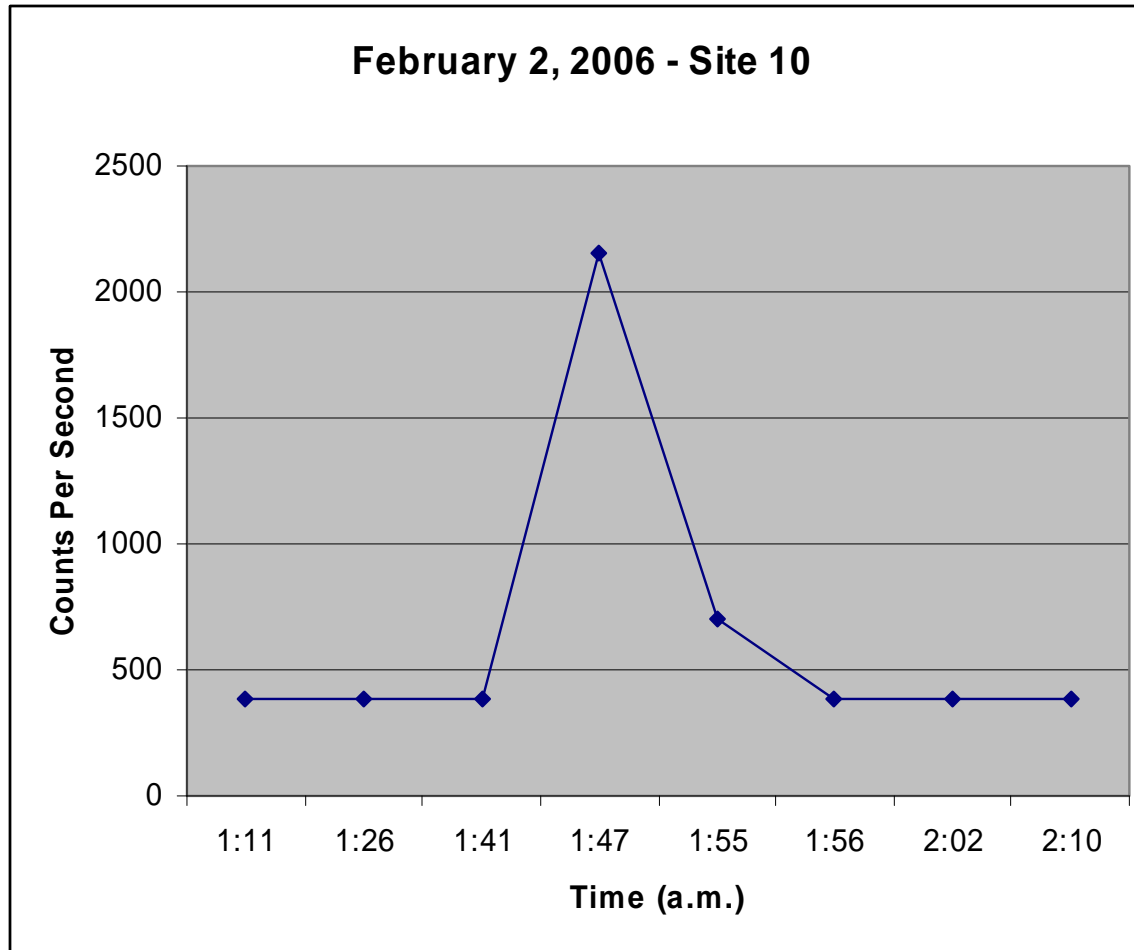
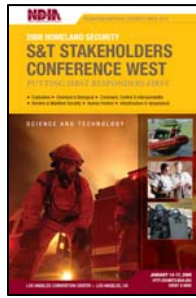
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REMS: Response During Rainstorm



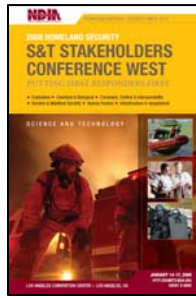
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REMS: Response from Industrial Radiography Source



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Planned REMS Expansion



- Increased number of sensors
- Data transmission via NYPD computer network to NYPD command center
- NYPD responsible for monitoring, operation, maintenance
- DHS provides support, including technical reachback for spectral analysis
- REMS complements NYPD mobile sensors



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New York Area Science and Technology (NYAST) Workgroup

Lawrence A. Ruth, Ph.D.
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“Putting First Responders First”



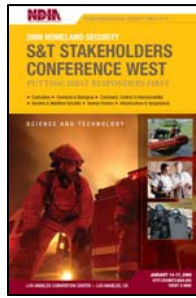
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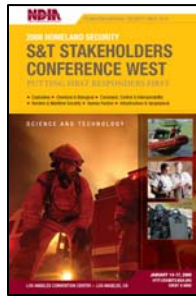
NYAST Workgroup

Consortium of federal, state, local government organizations, private sector groups that meets to communicate advances in & foster science & technology applications for homeland security



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NYAST Goals

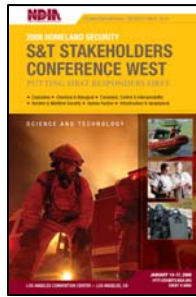


- Improve homeland security through application of technological advances at local level
 - Provide forum for communicating developments in S&T to help organizations at operational level understand & use homeland security technology & equipment
 - Obtain end-user feedback, including feedback to RDT&E cycle
 - Understand end-user needs & expectations for emerging homeland security technologies
 - Promote communication & interactions among federal, state, local government, other organizations in NY metro area



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NYAST Membership/Meetings

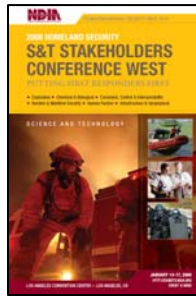


- **Membership**
 - ~130 organizations, >300 individual members
 - Federal, state, local government, private sector
- **Meetings**
 - Presentations by subject matter experts + discussion
 - 2-hours duration
 - 13 meetings since 2003
 - Held at EML conference center in Manhattan
- **Website (<https://eml.st.dhs.gov/nyast>)**
 - Dedicated, secure website for announcements, presentations, registrations



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NYAST Member Organizations

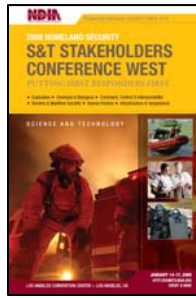


- Federal, state, local government, private sector
 - First responders
 - Emergency management
 - Law enforcement
 - Health & environmental agencies
 - Hospitals
 - Private sector security
 - Academic & research communities



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NYAST Past Meetings



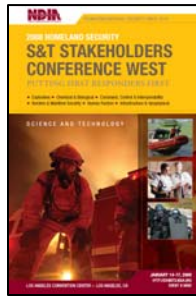
- Human Factors in Homeland Security
- Neutron Detection
- Chemical Countermeasures
- Recent Developments in Emergency Communications
- DHS Programs & Developments in Explosives Detection
- Results of Test & Evaluation of Commercially Available Radiation Detectors
- Biodefense Programs & Activities
- Real-time Radiation Monitoring Systems
- Radiological Event Emergency Responder Decision Support Playbook
- Status of DHS Standards Projects
- Radiological Dispersal Devices
- Background Ionizing Radiation
- Draft American National Standards for Radiation Protection Instrumentation for Homeland Security Applications



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NYAST

“Human Factors in Homeland Security” (13th Topical Meeting, 11 December 2007)

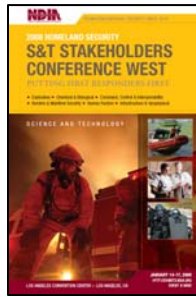


- “Overview of the DHS/S&T Human Factors Division”
 - Sharla Rausch, Director, Human Factors Division, S&T
- “Introducing the National Consortium for the Study of Terrorism and Responses to Terrorism (START)”
 - Gary LaFree, Director, START, University of Maryland
- “Threat Frequency, Fatigue, and Attentional Shifts in the X-ray Screening Task”
 - Joshua Rubinstein, Human Factors Program Lead, Transportation Security Laboratory, S&T



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NYAST Workgroup Website



Secure Site Login

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Secure Site Login:

Member Login:

Password:

[Reset Password](#)

[Change Password](#)

Login

Please note that the EML NYAST secure site has moved to a new address:

<https://eml.st.dhs.gov/NYAST>

Please update your links.

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New York Area Science and Technology Workgroup

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New York Area Science and Technology Workgroup

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[Upcoming Meetings](#)
[Past Meetings](#)
[NYAST Member Listing](#)
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Welcome to the New York Area Science & Technology Workgroup Website

The NYAST Workgroup is a consortium of federal, state, and local government organizations and private sector groups that meets to communicate the advances in and foster the application of science and technology that will be used for homeland security. The Workgroup holds topical informational meetings that serve as a forum where valuable contacts among individuals in various area organizations can be initiated and sustained. To further open channels of communication within the NYAST Workgroup, EML has created this secure web site where members can register for upcoming meetings, view the workgroup contact list, and download reports and presentations from past meetings. The NYAST Workgroup will provide a direct link from the DHS to the local operational-level organizations for conveying new information on developments in science and technology and receiving feedback on field operational experience.

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New York Area Science and Technology Workgroup

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New York Area Science and Technology Workgroup

Upcoming Meetings

[Download Adobe PDF Reader](#) | [Download MS Powerpoint Viewer](#)

13th Topical Meeting

HUMAN FACTORS IN HOMELAND SECURITY
Tuesday, December 11, 2007
DHS Environmental Measurements Laboratory
201 Varick Street, 5th floor
New York, NY

[Directions](#)
[View Meeting Announcement](#)
[RSVP for this Meeting](#)

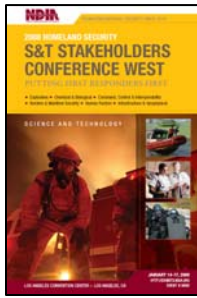
For more information on the NYAST Working Group contact Sylvia Kendall at:
<https://eml.st.dhs.gov/nyast/application/sylvia.kendall@dhs.gov>
For help in using this website please contact Ethel Davis at:
<https://eml.st.dhs.gov/nyast/application/ethel.jacob@dhs.gov>

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NYAST Workgroup Contacts



- Topical Meeting Chair
 - Lawrence.Ruth@dhs.gov

- Website Administrator
 - Ethel.Jacob@dhs.gov



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Securing the Cities Initiative

Adam Hutter

Director

Environmental Measurements Laboratory

Science and Technology Directorate

Department of Homeland Security



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Domestic Nuclear Detection Office (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.

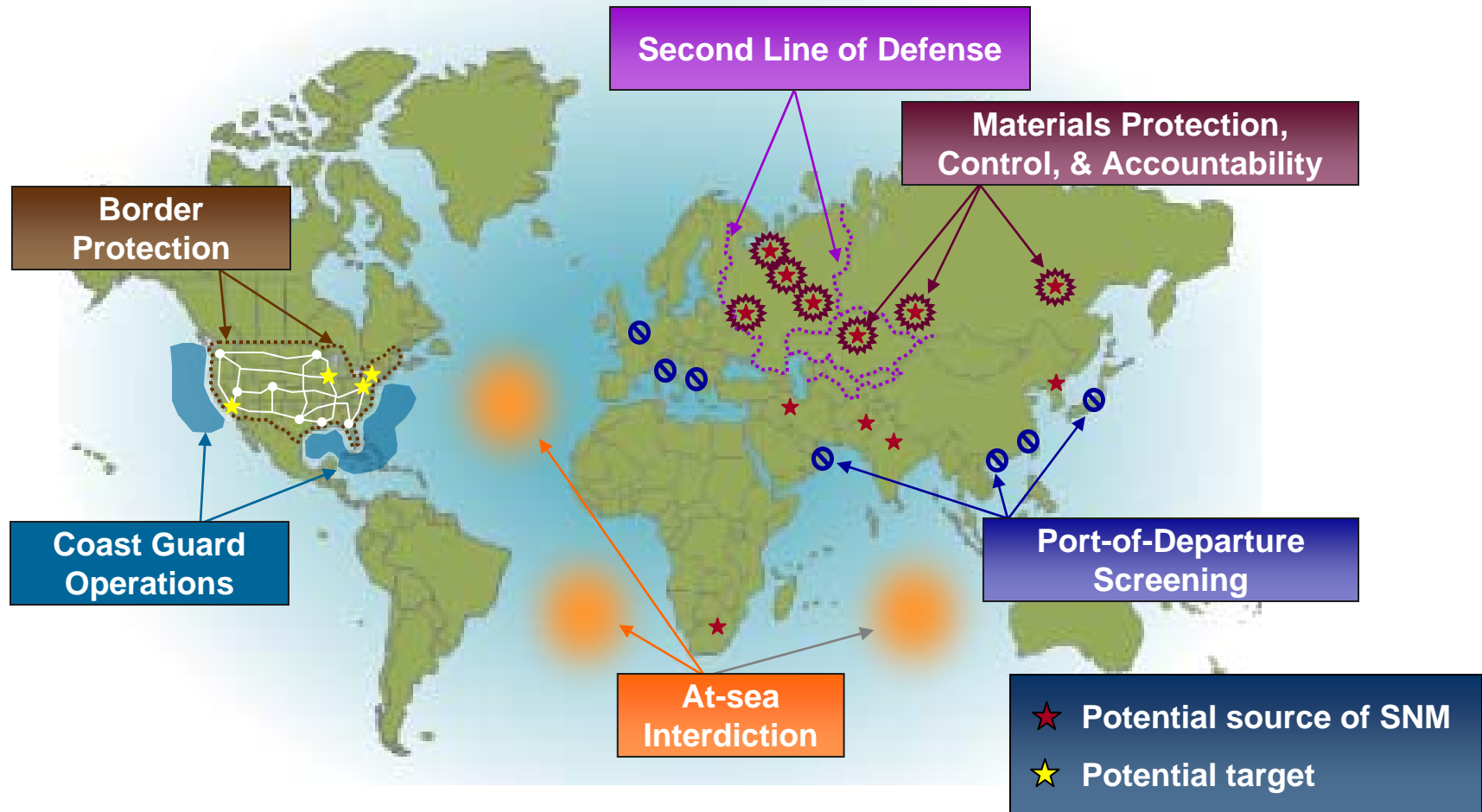
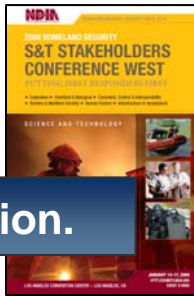
- Develop the global nuclear detection and reporting architecture
- Develop, acquire, and support the domestic nuclear detection and reporting system
- Fully characterize detector system performance before deployment
- Establish situational awareness through information sharing and analysis
- Establish operation protocols to ensure detection leads to effective response
- Conduct a transformational research and development program
- Establish the National Technical Nuclear Forensics Center to provide centralized planning and integration of USG nuclear forensics programs



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Global Nuclear Detection Architecture

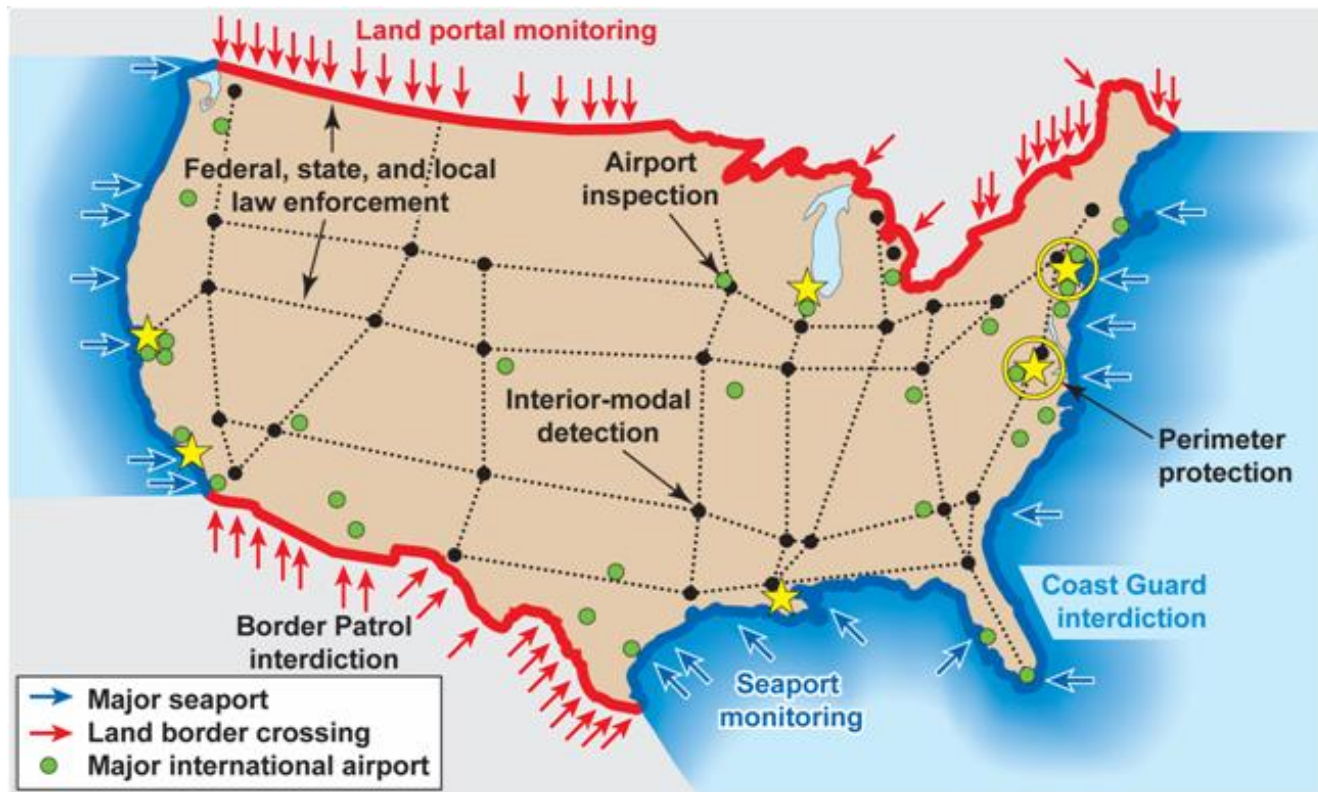
A multi-layered, international system offers multiple opportunities for detection.



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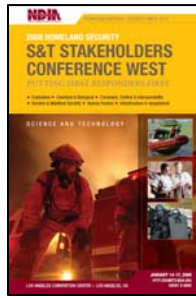
Domestic Layer

Reduce risk to high-density urban areas by developing, demonstrating, acquiring, and supporting the deployment of integrated rad/nuc detection and reporting systems for the domestic interior layer



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STC Goal & Objectives



Goal:

- To prevent a radiological/nuclear attack on New York by enhancing regional capabilities to detect, identify, and interdict illicit radioactive materials

Objectives:

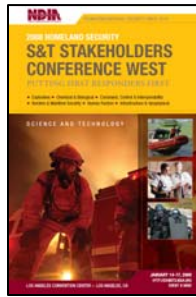
- Leverage current technologies and deploy them in a coordinated manner regionally
- Develop next-generation radiological sensors with isotopic discrimination capabilities for use in a dense urban environment
- Design, procure, and deploy an operationally viable regional architecture for these and existing sensors
- Develop and implement a common, multi-agency Concept of Operations (CONOPS) for sharing sensor data and resolving “hits” within the sensor architecture
- Train and exercise regional agencies to execute this CONOPS to high level of proficiency



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Deployment Strategy

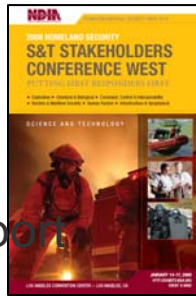
- Commercial vehicle inspection
- Sweeping/Monitoring operations
- Detection-enabled Law Enforcement (DELE)
- Event-based operations
- Threat Condition-driven operations
- Non-commercial vehicle screening
- Waterborne operations



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Regional Coordination

- DNDO responsible for federal program management and operational support
- NYPD spearheading regional coordination and operations
- EML provides day-to-day technical and programmatic support
- Three levels of working groups:
 - Principals
 - Federal: DNDO, FBI, DOE
 - City: NYPD, FDNY, OEM, OMB, DOHMH, DOT, Environmental Protection
 - Regional: CT Public Safety, NJ OHSP, MTA, PANYNJ, Nassau PD, Suffolk PD, NYS Gov. Office
 - STC Working Group
 - STC Subcommittees
 - Equipment (co-chaired by NYPD and NYSP)
 - Training & Exercise (co-chaired by NJ OHSP and NYSP)
 - CONOPS (co-chaired by Suffolk PD and Rockland PD)
 - Source Security (co-chaired by DNDO and NYPD)
 - Maritime (co-chaired USCG and NYPD)
 - Response & Recovery (co-chaired by FDNY and NYC DOHMH)

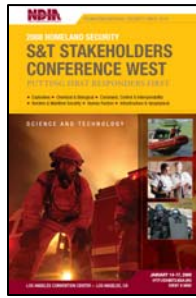


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Securing the Cities

Increase Capability in an Urban Region:

- Training – Tiered curriculum
- Equipment – Commercial Off the Shelf, Advanced
- Sustained Support
 - Regional Reachback
 - Workshops and Exercises
 - Analytical Tools



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Regional Reachback

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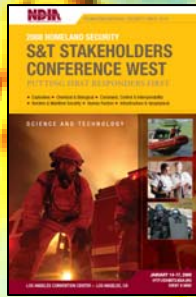
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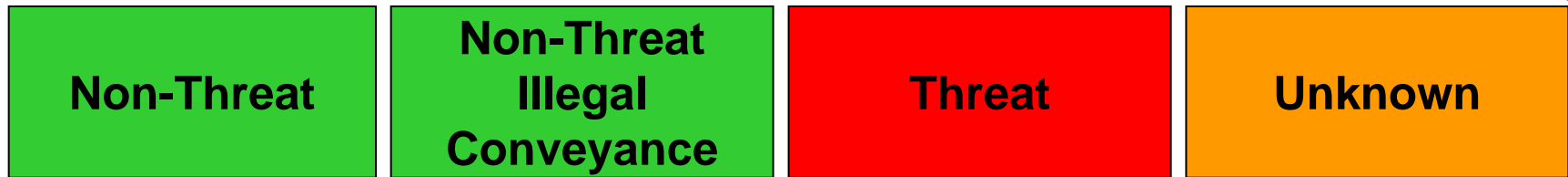
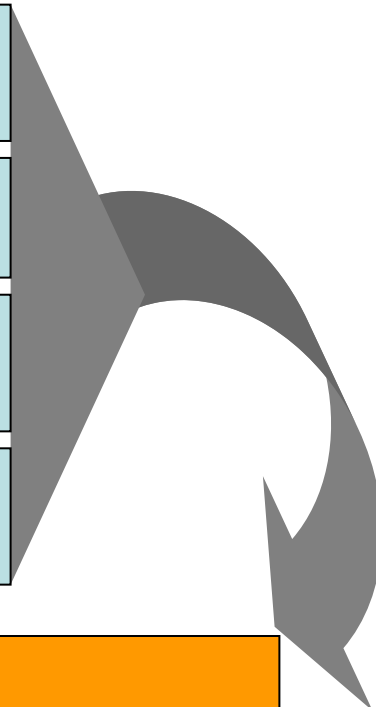


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US Government Alarm Adjudication

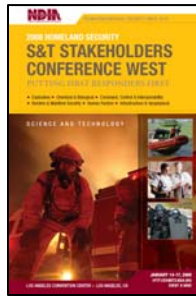


	Primary Secondary Screening	On-Site Adjudication	Initial Reachback	National Reachback
Local	LE →	S/L →	JAC RRB →	JAC SRB
Border	CBP/Coast Guard Officer →	CBP/Coast Guard Officer →	LSS →	JAC SRB
Federal	Federal Agent →	DOE Triage		
International	Sovereign Nation (US Involvement) →	National Agency (DOD, DOE, CSI) →	DOE Triage Or JAC SRB	



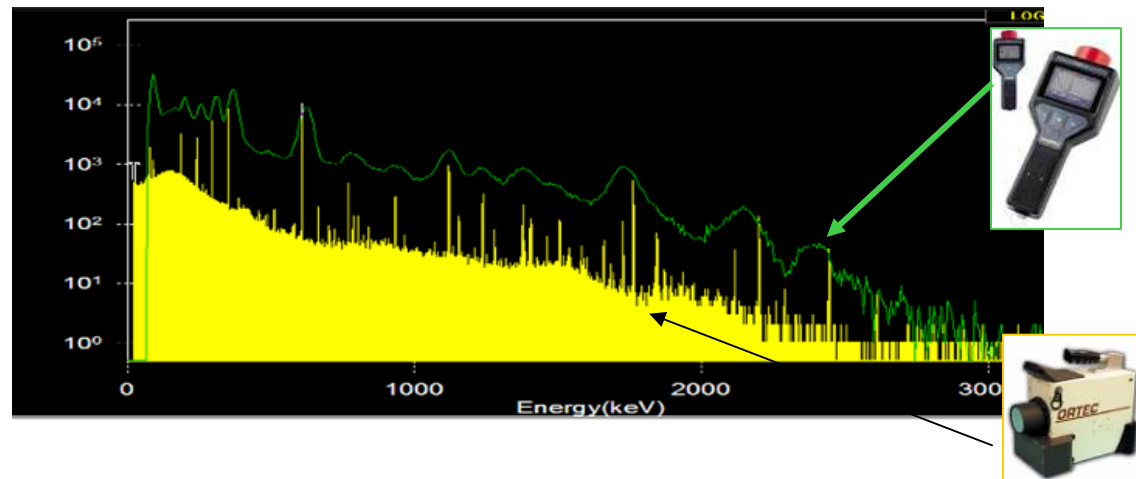
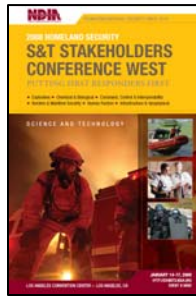
Reachback Goals

- Expert support to detector sites
 - Assist operators in resolving detection events
 - Interpret detector data and spectra
 - Troubleshoot detector issues and performance as part of data interpretation
- Alarm coordination with larger community
 - Provide radiological situational awareness to stakeholders as appropriate
 - Assess multiple alarms within broader context
- Correlates detector signatures from multiple sites / layers
 - Change detection of radiation signature from same vehicle at multiple detection sites
 - Track vehicles / radiation sources when they intersect multiple detector sites
- Detector System Improvement
 - Collect NORM data for continuous algorithm refinement, trending, and quality assurance
 - Maintain signatures database for expert analysis



Regional Reachback

- Initial contact for assistance goes to DNDO Joint Analysis Center
 - 877-DNDO-JAC
 - dndo.jac@dhs.gov
- Specially trained spectroscopists on call 24/7
- Northeast
 - Environmental Measurements Laboratory
 - Brookhaven National Laboratory
- Southeast
 - Oak Ridge National Laboratory
 - Savannah River National Laboratory
- Results
 - Material Identification
 - Quantity
 - Confidence
 - Threat Potential



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EML Support to SAVER

Adam Hutter

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“Putting First Responders First”

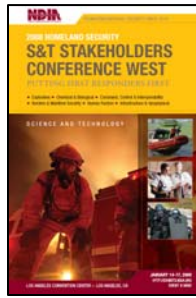


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System Assessment and Validation for Emergency Responders (SAVER)

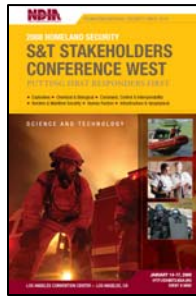


- The SAVER Program conducts unbiased operational tests on commercial equipment and systems, and provides those results along with other relevant equipment information to the community in an operationally useful form.
- The SAVER Program mission includes:
 - Conducting impartial, practitioner relevant, and operationally oriented assessments and validations of emergency responder equipment;
 - Providing information that enables decision makers and responders to better select, procure, use, and maintain emergency responder equipment.
- SAVER focuses primarily on two main questions for the emergency responder community:
 - “What equipment is available?”
 - “How does it perform?”



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SAVER Assessment Categories



- **Affordability** – This category groups criterion related to life cycle costs of a piece of equipment or system.
- **Capability** – This category groups criteria related to the power, capacity, or features available for a piece of equipment or system to perform one or more responder-relevant tasks.
- **Deployability** – This category groups criterion related to the movement, installation, or implementation of a piece of equipment or system by responders at the site of its intended use.
- **Maintainability** – This category groups criterion related to the maintenance and restoration of a piece of equipment or system to operational conditions by responders.
- **Usability** – This category groups criteria related to the quality of the responders' experience with the operational employment of a piece of equipment or system. This includes the relative ease of use, efficiency, and overall satisfaction of the responders with the equipment or system.





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Creetings

The U.S. Department of Homeland Security (DHS) has established the [System Assessment and Validation for Emergency Responders \(SAVER\)](#) Program to assist emergency responders making procurement decisions. The SAVER Program conducts unbiased operational tests on commercial equipment and systems, and provides those results along with other relevant equipment information to the community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

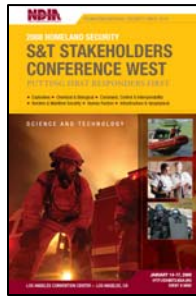
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AEL Category/Project	(Projects, Documents)
SAVER Docs	(86, 474)
01 Personal Protective Equipment	(10, 71)
02 Equipment - Explosive Device Mitigation and Remediation	(3, 10)
03 CBRNE Operational and Search and Rescue Equipment	(15, 100)
04 Information Technology	(11, 54)
05 Cyber Security Enhancement Equipment	(3, 13)
06 Interoperable Communications Equipment	(6, 29)
07 Detection	(14, 73)
08 Decontamination	(2, 11)
09 Medical	(1, 7)
11 CBRNE Reference Materials	(3, 9)
12 CBRNE Incident Response Vehicles	(1, 4)

SAVER Technical Agents



- The SAVER Program is established and supported by a network of technical agents who perform assessment and validation activities.
- Technical Agents:
 - Center for Domestic Preparedness (Anniston, Alabama)
 - Science Applications International Corporation (SAIC)
 - Space and Naval Warfare (SPAWAR) Systems Center, Charleston
 - Technical Support Working Group (TSWG)
 - Texas A&M Engineering / The Texas A&M University System
 - The Naval Surface Warfare Center Dahlgren Division
 - The Nevada Test Site Operated by National Security Technologies, LLC, for the Department of Energy
 - DHS/S&T/Environmental Measurements Laboratory (FY08 New Start)



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