



National Urban Security Technology Laboratory

Annual Report

2015



Homeland
Security

Science and Technology



National Urban Security Technology Laboratory

2015 Annual Report



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▼ INTRODUCTION

In 2015, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) First Responders Group (FRG) National Urban Security Technology Laboratory (NUSTL) celebrated its 69th year of service to the nation and its 12th year as the test and evaluation resource for the national first responder community as a homeland security laboratory.

With its locations in downtown New York City and the Chicago metropolitan area, NUSTL worked directly with federal, state and local first responders across the country and used its metropolitan locations to test and evaluate numerous and diverse technologies under development to prepare and protect our nation.

Throughout 2015, NUSTL interacted daily with first responders and homeland security representatives, which enabled them to bridge information and communication gaps between technology developers and first responder end users. The laboratory relayed first responder issues and needs to developers while advising first responders on innovative solutions from the technology development community.

The laboratory also continued to execute its Radiological/Nuclear Response and Recovery (RNRR) Research and Development (R&D) program, which aims to improve the first responder community's ability to respond and recover from radiological and nuclear incidents through R&D advancements in knowledge, technology policy and procedures. Accomplishments include:

URBAN OPERATIONAL EXPERIMENTATION (OPEX)

NUSTL conducted S&T's first Urban OpEx with federal, state and local first responders from across the nation. Experiments focused on social media analysis software, wireless communication and networking technology, law enforcement robots, biological agent detectors, a head up display and a portable gas chromatograph mass spectrometer.

RADIOLOGICAL DISPERSAL DEVICE GUIDANCE

The laboratory developed science-based response planning guidance for the critical first 100 minutes of response to a radiological dispersal device for first responders nationwide.

FIRST RESPONDER TECHNOLOGY ACQUISITION GUIDANCE DOCUMENTS

NUSTL published technical reports on first responder technologies to help first responders better select, procure, use and maintain their equipment.

FIELD ASSESSMENTS

The laboratory performed field assessments on first responder technologies such as card readers used by first responders to support anti-money laundering efforts and a tool designed to help first responders locate live human victims in disasters through heartbeat and respiration detection.

RADIOLOGICAL EMERGENCY MANAGEMENT SYSTEM (REMS)

NUSTL continued its quality assurance function for the first large-scale, urban deployment of a fixed post-event radiation monitoring network in the United States, and installed the NUSTL-developed REMS at New York City's Grand Central Terminal to assist with the Metropolitan Transit Authority's security efforts.

These accomplishments, along with our many other program and project achievements, are detailed in this 2015 Annual Report and would not have been possible without the hard work and dedication of our talented staff members. Many of these individuals were honored at the 2015 S&T Under Secretary's Award Ceremony for their exceptional work and extraordinary leadership.



EML scientists taking field measurements in the 1960s.



NUSTL Director Adam Hutter and former Testbeds Director Pamela Greenlawn review Securing the Cities radiation detection equipment with the Port Authority of New York and New Jersey Police Department.

▼ WE ARE NUSTL

NUSTL has a rich and proud history that stretches back to the Manhattan Project era of the 1940s and the Cold War period during which it held various radiation and nuclear measurement roles. After being part of the Department of Energy (DOE) for a number of years, in 2003 the then-Environmental Measurements Laboratory (EML) transferred to the newly established DHS.

In 2009, EML's name changed to NUSTL to represent its new role as the testing and evaluation laboratory for the national first responder community. In 2013, NUSTL officially opened its new facility in a ribbon-cutting ceremony with the New York City Police and Fire Departments.

Today, NUSTL is a government-owned, government-operated laboratory, programmatically aligned to S&T's support to the Homeland Security Enterprise (HSE) and FRG, with operational funding through the S&T Office of National Laboratories.

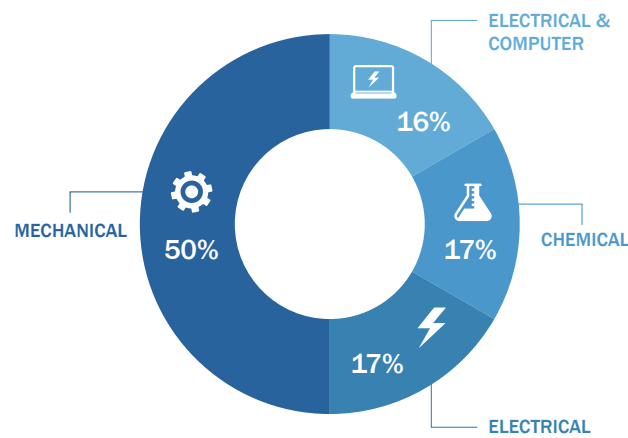
The NUSTL mission is three-fold:

- **Testing and Evaluation** – conducting tests, evaluations and operational assessments of homeland security technologies for the national first responder community;
- **R&D, RNRR** – saving lives, minimizing economic impact and enhancing resiliency following a radiological or nuclear event; and
- **Technical Advisors to First Responders** – bridging the knowledge gap between technology developers and end-users ensuring the effectiveness, performance and suitability of technologies for operational deployment.

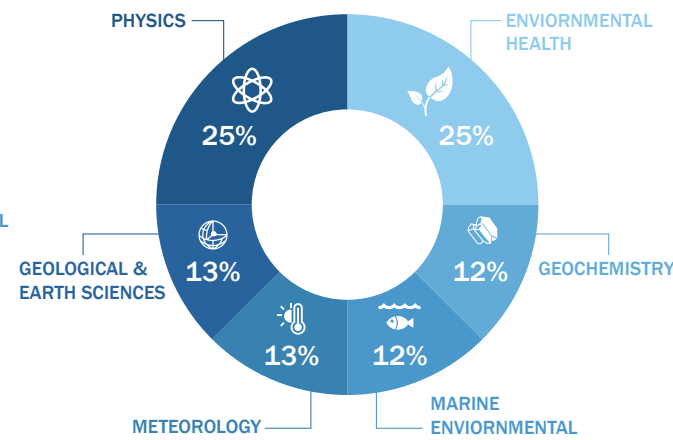
The NUSTL mission is executed by a staff comprised of an eclectic mix of homeland security professionals with varied educational and experiential backgrounds.

The two main disciplines of the NUSTL staff are:

ENGINEERING

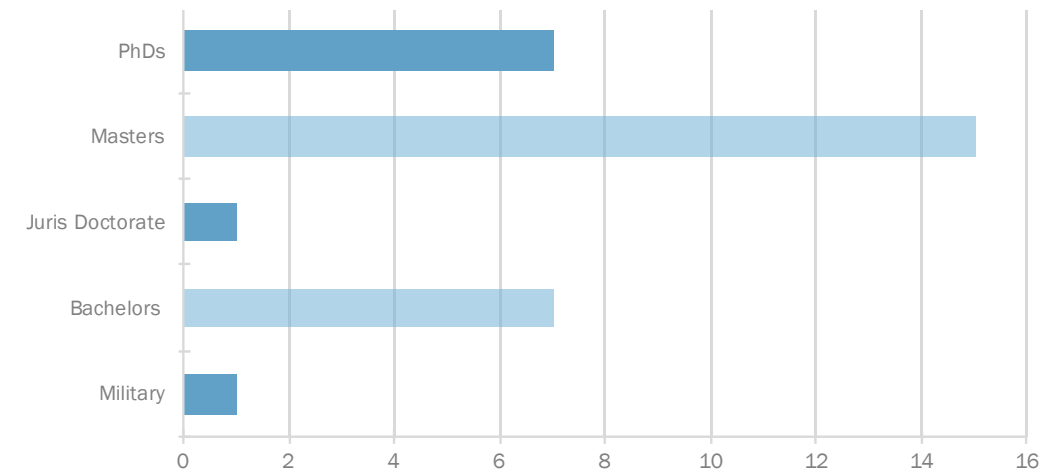


SCIENCE

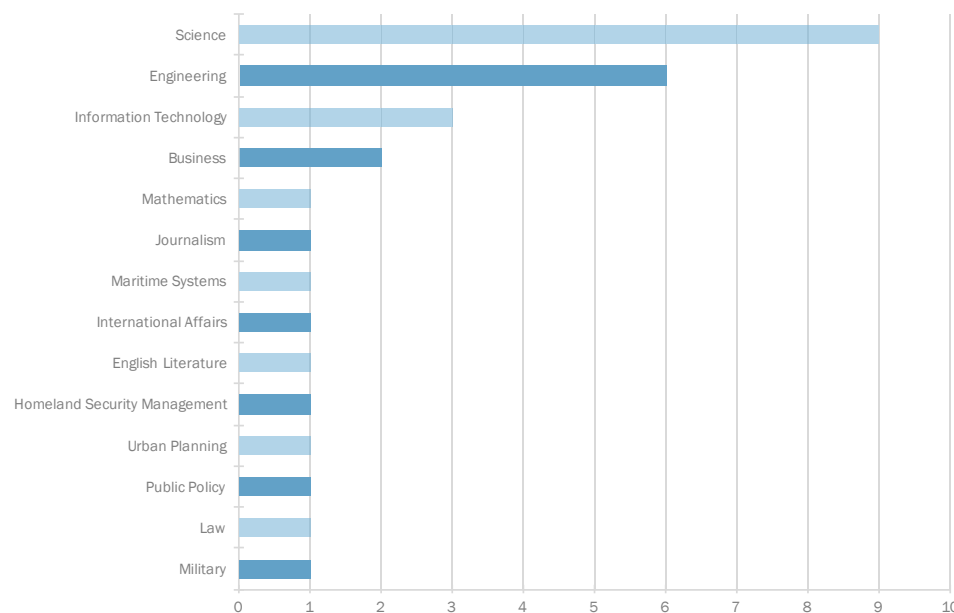


Additionally, many NUSTL staff members possess advanced degrees (doctorates, masters and juris doctorate) and broad professional experience across private, government, academic and military sectors.

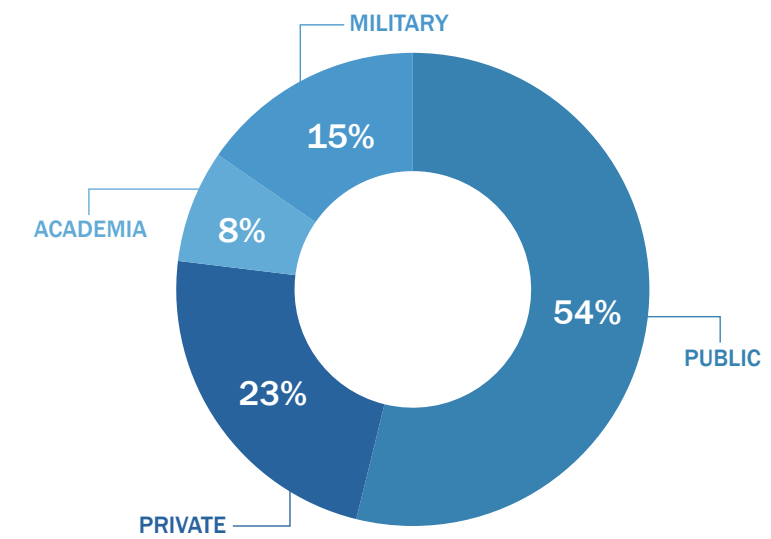
EDUCATION LEVEL



STAFF EDUCATIONAL FOCUS



SERVICE AREA



This diverse skill set and tireless work ethic of the laboratory staff has resulted in the receipt of numerous awards for professional achievements, community contributions and overall leadership and influence.

DHS S&T UNDER SECRETARY HONORS NUSTL LABORATORY DIRECTOR AND CONTRACTOR STAFF AT S&T'S ANNUAL AWARD CEREMONY



The Under Secretary for Science and Technology Dr. Reginald Brothers presented NUSTL Director Adam Hutter with a leadership award for building a national test and evaluation laboratory for first responder related equipment, technologies and systems in alignment with S&T strategic goals and initiatives. Additionally, NUSTL support staff members Geoffrey Buteau, Kris Dooley, Abby Hooper, Christian Madera and Steve Vargas were recognized for their outstanding support.



Buteau was cited for providing expertise for vital program support functions including strategic planning support and process improvements.



Dooley, Hooper, Madera and Vargas were recognized for their outstanding contribution to NUSTL in its effort to attain accreditation from the International Standards Organization for Quality Management by developing significant new processes and documentation that became NUSTL policy.

July 23, 2015.

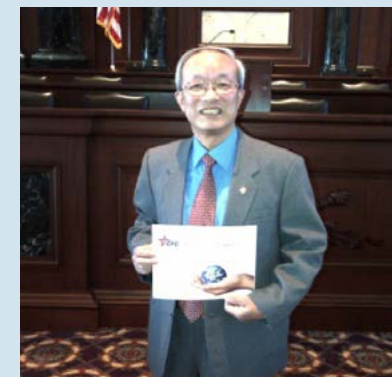
DHS S&T HONORS NUSTL SCIENTISTS AT ITS PATENT AWARD CEREMONY



NUSTL Physicist Gladys Klemic and Mechanical Engineer Cecilia Murtagh were honored at the DHS S&T Patent Awards Ceremony for developing the very thin dosimeter filters and low profile dosimeter that became the first patent for DHS. Patent Number 7,781,747 was issued on August 24, 2010 for the wallet sized plastic card that serves as a portable device and has the capability to measure the amount of radiation on a person or in a given area in a convenient way. The wearable card-like dosimeter combines equilibrium and energy compensation filters that surround a luminescent material. Inspired by the MetroCards used every day to get around New York City, the NUSTL team envisioned a dosimeter with similar convenience that measures and records the amount of radiation and can connect to a database or be sent to a processing center for readout. See <http://www.dhs.gov/dhss-first-patent-citizens-dosimeter>.

June 16, 2015.

NUSTL'S SAM LEE RECEIVES COMBINED FEDERAL CAMPAIGN FUNDRAISING AWARD

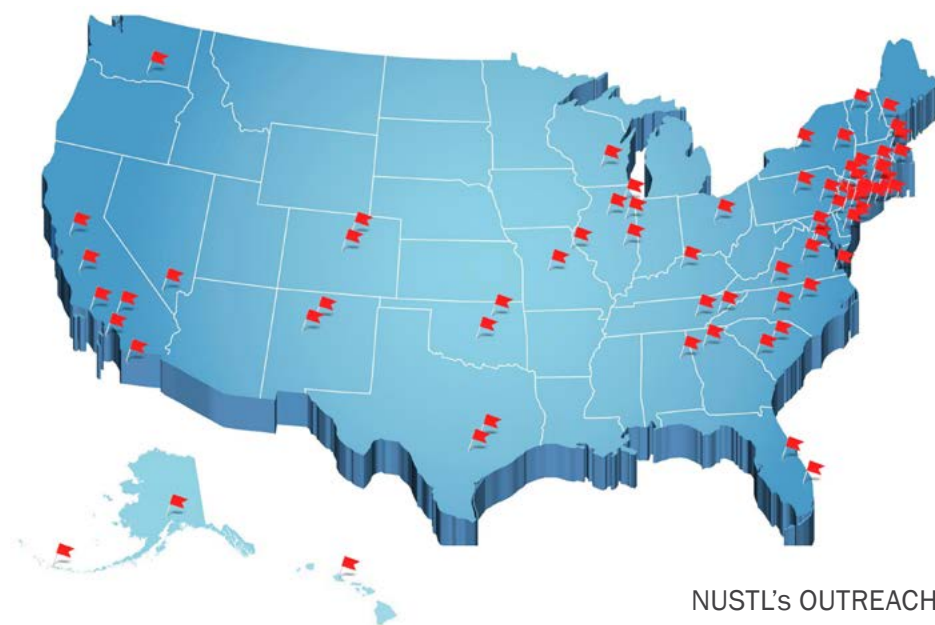


NUSTL Physical Scientist Sam Lee received an award from the New York City Combined Federal Campaign (CFC) at its annual awards ceremony. As the CFC Loaned Executive for Division 3, which includes DHS and Department of Defense agencies located in New York City, Lee surpassed the fundraising goal of \$384,850 set by the local federal Coordinating Committee by raising \$409,292.48.

April 16, 2015



▼ PARTNERING AND COLLABORATING WITH THE NATIONAL FIRST RESPONDER COMMUNITY

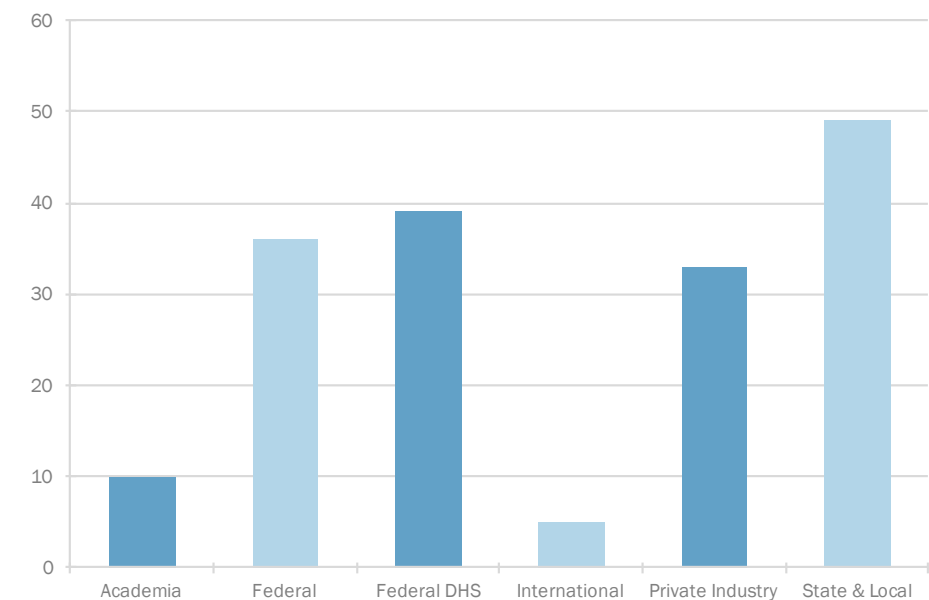


NUSTL's OUTREACH | 2013-2015

NUSTL partners and collaborates with numerous homeland security related entities nationwide while performing its mission as the testing and evaluation laboratory for the national first responder community. Partners include federal, state and local first responders and agencies, academic institutions, international organizations and the private sector.

As can be seen in the bar graph below, NUSTL worked with 49 state and local, 36 federal, 39 DHS, 12 academic, 5 international and 33 private industry partners in 2015.

2015 PARTNERSHIPS



This is an expansion from 2014, as NUSTL worked with dedicated partners in 11 additional states such as:

ALABAMA

The Federal Emergency Management Agency's (FEMA) Center for Domestic Preparedness served as a resource of training expertise for NUSTL's RNRR team in 2015. Discussions were held to determine how serious gaming could tie into emergency management training programs. Additionally they developed course materials for the Radiological Operations Support Specialist position, which seeks to ensure incident commanders have access to subject matter experts (SMEs) with verified skills, knowledge and abilities during radiological events.

ALASKA

NUSTL Test Engineer Bhargav Patel traveled throughout Alaska with the United States Coast Guard (USCG) as a part of the Partnering for Innovation & Operational Needs through Embedding for Effective Relationships (PIONEER) program to further develop NUSTL's relationships, enhance interaction and increase understanding on research and development processes.

GEORGIA

NUSTL's RNRR team worked with the National Library of Medicine, the Environmental Protection Agency (EPA) and the Georgia Technology Research Institute to develop an electronic Radiological Decontamination Application. The final application will help local agencies make efficient safety, recovery and clean-up decisions following a radiological incident.

HAWAII

Physicist Paul Goldhagen presented on the Use of Cosmic-Ray Neutron data in Nuclear Threat Detection and Other Applications at the Neutron Monitor Community Workshop in Honolulu, Hawaii. The presentation at this workshop, along with networking during the event, led to a collaborative request between the National Geospatial-Intelligence Agency and NUSTL.

KENTUCKY

NUSTL hosted approximately 45 first responders and radiological SMEs for a peer review of the response guidance and supporting materials session entitled, "The First 100 Minutes After an Outdoor Explosive Radiological Dispersal Device (RDD): A Concept For A Successful Tactical Response." Among those 45 first responders, included representatives from the Conference of Radiation Control Program Directors.

Additionally, NUSTL continued to expand membership of their New York Area Science and Technology Forum (NYAST) nationally by utilizing web-based forums. In 2015, representatives from the Louisville Metro Police Department became NYAST members to learn about technologies developments related to the homeland security community.

NEW HAMPSHIRE

The University of New Hampshire, along with University of Vermont, organized a Neutron Monitor Community Workshop and invited Physicist Paul Goldhagen to present at as a SME and operational resource. This workshop was designed to evaluate the United States supported neutron monitor network, including the network's utility, value, recommended priorities and recommended actions.

OHIO

NUSTL, along with the DOE, hosted a Wide-Area Urban Radiological Containment Mitigation and Clean-up Toolbox of Technologies demonstration in Columbus, Ohio. Recognizing the need for agencies to understand the cleanup options available for quickly dealing with radiological events of all sizes, first responders were able to see firsthand how technologies can support their efforts for contamination containment and gross decontamination of infrastructure and vehicles.

PENNSYLVANIA

NUSTL, Sandia National Laboratories and the Brookhaven National Laboratory developed a tool titled, "Science-based Response Planning Guidance for the First 100 Minutes of the Response to a Radiological Dispersion Device Detonation." This tool was piloted in Philadelphia, Pennsylvania, to further develop their city-specific, local plan and discuss the tactics outlined. The pilot session was attended by 25 local agency representatives and 30 federal agency representatives.

VERMONT

NUSTL held a beta test user session on the Radiological Decontamination Application in Burlington, Vermont. The event was attended by local responders, emergency managers and health officials who tested the applications and provided feedback which was utilized to finalize the application.

WASHINGTON

Through NUSTL's System Assessment and Validation for Emergency Responders (SAVER) Program, Physicist Gladys Klemic initiated a project as requested by the New York City Department of Health and Mental Hygiene (DOHMH) to assist in characterization studies of their new personal dosimetry system. NUSTL will work with the DOHMH to conduct tests on samples of the dosimeters and will arrange for irradiations to be performed by the Pacific Northwest National Laboratory.

WISCONSIN

NUSTL and FEMA co-chair the Scientific Support Working Group. During the April 2015 meeting, Dr. Vikki Bier of University of Wisconsin presented her research into optimizing evacuation zones during power plant incidents. Additionally, a waste treatment and disposal facility in Wisconsin was utilized to complete the decommissioning and decontamination process of NUSTL's previous workspace.

COLLABORATION HUB FOR THE HOMELAND SECURITY ENTERPRISE (HSE)



FEMA Region 2 Preparedness Analyst Terry Winters participating in the Urban Operational Experimentation hosted by NUSTL.

NUSTL's state-of-the art, fully equipped facility, developed in 2012, was created in part for the purpose of increasing collaboration across the HSE. Numerous federal, state and local entities have leveraged NUSTL and its facility for technology and equipment testing and evaluation; training sessions and demonstrations; conferences, briefings and meetings and also as a collaborative workspace.

Throughout 2015, NUSTL established new and maintained existing collaborative workspaces for representatives from the:

- FEMA Region II Office;
- New York City Police Department's (NYPD) Science and Technology Office;
- DHS National Protection and Programs Directorate's Office of Infrastructure Protection;
- DHS Explosives Division; and
- DHS Intelligence & Analysis.

The collaborative workspaces have effectively and efficiently strengthened our partnerships with these agencies. This was evident by the increased use of NUSTL's meeting spaces by agency partners, as well as increased support in various NUSTL activities such as the S&T OpEx.

PARTNERSHIPS

Below outlines the organizations that NUSTL partnered with throughout 2015.

ACADEMIA

- Borough of Manhattan Community College
- Chicago School District
- Christian Regenhard Center for Emergency Response Studies
- Columbia University
- Georgia Tech Research Institute
- Harvard University
- Hofstra North Shore-LIJ School of Medicine
- Massachusetts Institute of Technology
- Stevens Institute of Technology
- University of Delaware
- University of New Hampshire
- University of Wisconsin

CHICAGO SCHOOL DISTRICT

NUSTL donated a laptop to the Chicago School District to support the General Services Administration's Computers for Learning Program. This program encourages and promotes the reuse of government computers by allowing them to be donated directly to schools and educational nonprofit organizations.

STEVENS INSTITUTE OF TECHNOLOGY

As a DHS Center of Excellence, Stevens Institute of Technology has collaboratively worked with NUSTL for several years. In 2015, two interns from Stevens supported test and evaluation projects at NUSTL. Additionally, Stevens leadership and students attended and participated in the 2015 DHS S&T Urban Operational Experimentation.

FEDERAL

- Centers for Disease Control and Prevention
- Center for Radiological/Nuclear Training – Nevada Test Site
- Combined Federal Campaign
- Conference of Radiation Control Program Directors
- Defense Advanced Research Projects Agency – SIGMA

CENTERS FOR DISEASE CONTROL AND PREVENTION

The Centers for Disease Control and Prevention participated in the RNRR's Peer Review Session for the Scientific Support for RDD Response & Recovery: The First 100 Minutes of the Response.

FEDERAL (continued)

- Department of Defense
- Department of Energy
- Department of Energy – Argonne National Laboratory
- Department of Energy – Lawrence Livermore National Laboratory
- Department of Energy – Oak Ridge National Laboratory
- Department of Energy – Pacific Northwest National Laboratory
- Department of Energy – Remote Sensing Laboratory
- Department of Energy – Sandia National Laboratory
- Environmental Protection Agency
- Environmental Protection Agency – Region 2
- Federal Bureau of Investigation – Newark Field Office
- First Responder Resource Group
- Food and Drug Administration
- General Services Administration
- Health Physics Society
- Lawrence Berkeley National Laboratory – Institute for Resilient Communities
- Massachusetts Institute of Technology
- National Atmospheric Release Advisory Center

DEPARTMENT OF ENERGY – OAK RIDGE NATIONAL LABORATORY

SMEs from Oak Ridge are supporting the development of the Guidance for First Responder use of Preventive Radiological / Nuclear Detection Equipment for Performance during Consequence Management Operations.

FOOD AND DRUG ADMINISTRATION

Two subject matter experts presented at the Quarterly Federal Radiological Preparedness Coordinating Committee meeting, attended by NUSTL Laboratory Director Adam Hutter. They discussed on coordinated preparedness and response for a radiological emergency among committee members and with other emergency organizations.

- National Council on Radiation Protection and Measurements
- National Guard – Civil Support Team
- National Institutes of Health – National Library of Medicine
- National Property Management Association
- National Science Foundation
- National Security Council – Medical Preparedness Policy
- New York Army National Guard

- Occupational Safety and Health Administration
- Office of Personnel Management
- U.S. Army – Armament Research, Development and Engineering Center
- U.S. Postal Service
- U.S. Public Health Service
- White House Office of Science and Technology Policy – National Preparedness Science and Technology Task Force

FEDERAL - DHS

- Asset and Logistics Management Branch
- Chemical Security Analysis Center
- Conference Management Office
- U.S. Customs and Border Protection
- Domestic Nuclear Detection Office
- Export Controls Group
- Federal Emergency Management Agency
- Federal Emergency Management Agency, Center for Domestic Preparedness
- Federal Emergency Management Agency, Emergency Management Institute
- Federal Emergency Management Agency, National Integration Center
- Federal Emergency Management Agency, Radiological Emergency Preparedness Branch
- Federal Emergency Management Agency Region I
- Federal Emergency Management Agency Region II
- Federal Emergency Management Agency Region III
- Federal Emergency Management Agency ‘s Chemical, Biological, Radiological, Nuclear and Explosives Division
- Homeland Security Advanced Research Project Agency, Resilient Systems Division
- Homeland Security Investigations Chicago Field Division, Office of the Special Agent in Charge
- Intelligence and Analysis
- Interagency Modeling Atmospheric and Assessment Center
- National Biodefense Analysis and Countermeasures Center
- National Protection and Programs Directorate
- Office of Chief Information Officer
- Office of Infrastructure Protection
- Office of Procurement Operations
- Office of the Chief Scientist

FEDERAL - DHS (continued)

- Office of National Laboratories
- Office of National Laboratories Construction Branch
- Office of National Laboratories Utilization Branch
- Plum Island Animal Disease Center
- Research and Development Partnerships
- Resilient Systems Division
- First Responder Technologies
- S&T PIONEER
- Transportation Security Laboratory
- U.S. Coast Guard
- U.S. Secret Service
- Office for Interoperability & Compatibility, Next Generation First Responder Apex Program

INTERNATIONAL

- Defense Research and Development Canada
- Environment Canada
- Fraunhofer Institute – Competence Center
- North Atlantic Treaty Organization
- Thermo Fisher

**FRAUNHOFER INSTITUTE –
COMPETENCE CENTER**

NUSTL Laboratory Director Adam Hutter hosted Ulrich Meissen, the Director of the Competence Center from the Fraunhofer Institute in Germany, to discuss potential collaborative efforts and to determine a mechanism to showcase NUSTL's products and services in Fraunhofer's Safety Laboratory in Berlin.

PRIVATE INDUSTRY

- ADI Technologies
- Amazon Web Services
- Applied Research Associates
- Avon Protection Systems
- BAE Systems
- Battelle
- Booz Allen Hamilton
- Center for Risk Communications
- Chainbridge Technologies
- Cold Ground Transport, LLC

- Consolidated Edison
- Disaster Rep
- Entertainment Software and Cognitive Neurotherapeutics Society
- FedCap
- FLIR Systems, Inc.
- GE Global Research
- Gryphon
- Image Insight, Inc.
- Landauer, Inc.
- Mabbett and Associates
- Macy's
- National Security Technologies, LLC
- Passport Systems, Inc.
- PathSensors, Inc.
- PerkinElmer
- Physical Sciences, Inc.
- Riot Games
- Smart Imaging Systems, Inc.
- Thermo Fisher
- Underwriters Laboratory
- Vera Security Services
- WM Robots
- Yorktel

FLIR SYSTEMS, INC

FLIR Systems, Inc. provided a networked array of portable sensors for experimentation during the 2015 DHS S&T Urban Operational Experimentation.

MACY'S

NUSTL participated on Federal Coordinator "One DHS" team to support local law enforcement for Macy's Fourth of July firework celebration in New York City.

YORKTEL

Yorktel upgraded Information Technology equipment throughout NUSTL to ensure a state-of-the-art facility which facilitates NUSTL's mission of providing innovative tools, resources and capabilities for collaboration.

STATE & LOCAL

- Amtrak Police Department
- Boston Fire Department
- California Governor’s Office of Emergency Services
- Chesterfield County Fire and EMS
- Chicago Fire Department
- Chicago Police Department
- Connecticut State Police Department
- Illinois State Police
- Metropolitan Transportation Authority
- Metropolitan Transportation Authority – Police Department
- Montgomery County Fire and Rescue
- Nassau County Police Department
- New Jersey Office of Homeland Security and Preparedness
- New Jersey State Police Department
- New York City Department of Environmental Protection
- New York City Department of Health and Mental Hygiene
- New York City Emergency Management
- New York City Emergency Management – Social Media Group
- New York City Fire Department
- New York City Fire Department – HazMat

CHICAGO FIRE DEPARTMENT

The Chicago Fire Department District Chief attended the 2015 DHS S&T Urban Operational Experimentation and served as a subject matter expert evaluator for head up display technologies.

NEWARK FIRE DEPARTMENT

The Newark Fire Department evaluated Finding Individuals for Disaster and Emergency Response (FINDER), a tool designed to assist first responders in locating live human victims in disasters through heartbeat and respiration detection, during an operational field assessment.

- New York City Fire Department – R&D
- New York City Police Department
- New York City Police Department – Bomb Squad
- New York City Police Department – Counterterrorism Division
- New York City Police Department – SHIELD
- New York State Division of Homeland Security & Emergency Services
- Newark Fire Department
- Newark Office of Emergency Management
- Newark Police Department – Emergency Services Unit

- Pompano Beach Police Department
- Port Authority of New York and New Jersey
- Port Authority of New York and New Jersey – Police Department
- Port Authority of New York and New Jersey – Trans-Hudson Company
- Rockland County Sheriff’s Department
- St. Charles Police Department
- Suffolk County Police Department
- Westmont Police Department
- Columbus City Council
- Metropolitan Transit Authority
- Metropolitan Transit Authority – Metro-North Railroad
- Navajo Nation
- Vermont Department of Health
- Westchester County Emergency Management
- Westchester County Police Department

POMPANO BEACH POLICE DEPARTMENT

The Pompano Beach Police Department sought radiation detection equipment from NUSTL. They were provided knowledge products, introduced to First Responders Communities of Practice and sent contact information for NUSTL’s New York City Police Department’s radiation detection SMEs for head up display technologies.

ST. CHARLES POLICE DEPARTMENT

The St. Charles Police Department in Illinois evaluated the Electronic Recovery and Access to Data (ERAD) pre-paid card reader, which was developed to assist local law enforcement with countering money laundering. The ERAD pre-paid card reader can be used to quickly obtain balance information on pre-paid cards and allow for immediate action, such as balance inquiries, freezes and seizures on any questionable activities.

NEW YORK AREA SCIENCE AND TECHNOLOGY FORUM

NUSTL established the NYAST to bridge information and communication gaps that exist between science and technology developers and first responder users within the homeland security community.

Today, NYAST is comprised of more than 110 federal, state and local first responder organizations, government agencies, academic institutions and private sector groups that meet to promote and discuss advances in science and technology applications.

Since its development in 2003, NUSTL has hosted 36 NYAST meetings (in-person and virtually via webinar) covering topics such as Virtual First Responder Training, Advances in Surveillance Technologies, Biological and Chemical Detection, and Feature Attribute Screening Technology.

In 2015, NUSTL held two NYAST meetings including Countering Unmanned Aerial Systems (UAS) and Fully Aware: Making Informed Decisions that Save Lives, the first of a three part series on S&T's Next Generation First Responder (NGFR) Apex Program. NGFR focuses on the development of cutting edge solutions to improve first responders' protection and safety, reduce emergency response time and accelerate decision-making.

The NYAST meetings held in 2015 were highly successful with approximately 80 NYAST members representing numerous federal, state and local entities of the homeland security community attending either in person or via webinar. This included members from the NYPD, EPA, New York City Fire Department (FDNY), the Stevens Institute of Technology, the Christian Regenhard Center for Emergency Response Studies, Consolidated Edison and the U.S. Customs and Border Protection.

NYAST 35 – Countering Unmanned Aerial Systems



Joseph Scott of the S&T Resilient Systems Division (RSD) speaks with first responders at NYAST 35.



Bhavanjot Singh of the U.S. Army Armaments Research, Development and Engineering Center (ARDEC) speaks at NYAST 35.

NUSTL held its 35th NYAST meeting on March 26, 2015, on the topic of *Countering UAS*. Joseph Scott of the S&T Homeland Security Advanced Research Project Agency, Resilient Systems Division and Bhavanjot Singh of the U.S. Army Armament Research, Development and Engineering Center discussed countering small UAS in urban areas and the challenges faced in responding to them. Additionally, they highlighted the latest advances in technologies being developed to detect, monitor, sort and respond to such UAS threats.

NYAST 36 – Fully Aware: Making Informed Decisions that Save Lives



DHS S&T Office for Interoperability and Compatibility Director John Merrill speaks at NYAST 36 on NGFR technologies.



Communications hub device which integrates an array of wireless communications technologies including land mobile radios, smartphones and WiFi.

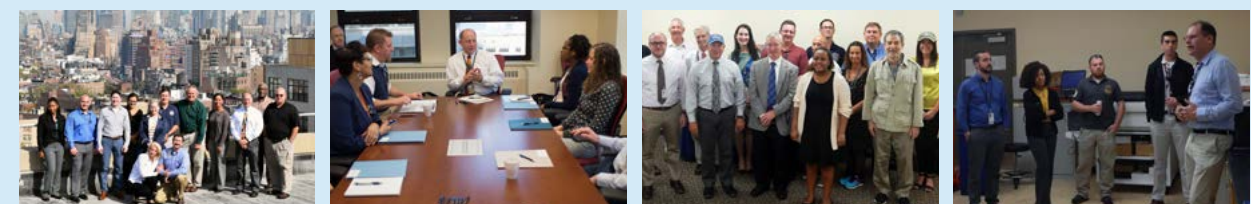
NUSTL held its 36th NYAST on October 29, 2015, on the topic of *Fully Aware: Making Informed Decisions that Save Lives*. The presenter was DHS S&T Office for Interoperability and Compatibility Director John Merrill. Merrill discussed several NGFR projects intended to provide first responders with situational awareness capabilities to support informed decision making during an emergency. The projects highlighted were indoor tracking, artificial intelligence and heads-up display technologies.

▼ PIONEER

NUSTL Hosts S&T Partnering for Innovation & Operational Needs through Embedding for Effective Relationships Program / Sprint Visit Team

DHS S&T's PIONEER program, as part of its "Sprint" initiative, sent four groups to NUSTL. The more than 40 participants from throughout S&T, the Office of Test and Evaluation, Office of National Laboratories, Homeland Security Advanced Research Projects Agency, Research & Development Partnerships, the Finance and Budget Division and the Plum Island Animal Disease Center.

Each Sprint visit began with an overview presentation and a tour of the laboratory. Additionally, NUSTL project managers, engineers and scientists provided program overviews, demonstrations and briefings on NUSTL capabilities and current projects. The hands on experience offered an opportunity for NUSTL staff to meet representatives from various DHS entities and to showcase the value of its programs, processes, research and tools.



▼ TEST AND EVALUATION

SYSTEM ASSESSMENT AND VALIDATION FOR EMERGENCY RESPONDERS

NUSTL's SAVER Program conducts assessments and validations of emergency response equipment and systems, and provides those results along with other relevant equipment information to the emergency responder community in an operationally useful form. SAVER knowledge products enable decision-makers and responders to better select, procure, use and maintain emergency response equipment.

Information provided by the SAVER Program is shared nationally with the responder community and is published on the SAVER website, <https://www.dhs.gov/science-and-technology/saver> for unlimited distribution documents and for restricted distribution documents, providing a life- and cost-saving asset to DHS, as well as to federal, state and local responders.

During 2015, NUSTL published 24 SAVER reports, including 16 Market Survey Reports, seven TechNotes and one Handbook. Additionally, five SAVER-on-Demand (SoD) projects were initiated. SoD projects originate from direct requests made by emergency response organizations for evaluation of specific technologies or equipment.

The published reports are listed below and can be found on FirstResponder.gov:

- *Environmental (Weather) Surveillance Equipment TechNote*
- *Standoff Radiation Detectors Market Survey Report*
- *Personal Cooling Systems Market Survey Report*
- *Live Scan Fingerprint Systems Market Survey Report*
- *Portable Ion Mobility Spectroscopy (IMS) Chemical Agent Detectors Market Survey Report*
- *Environmental (Weather) Surveillance Equipment Market Survey Report*

- *Biological Agent Detection Equipment for Field Use by Emergency Responders Handbook*
- *Encryption Software Tools Market Survey Report*
- *Self-Contained Breathing Apparatus, Full-Face-Piece, Closed Circuit TechNote*
- *Portable Radiation Portal Monitors TechNote*
- *Walk-Through Metal Detectors Market Survey Report*
- *Flame and Photo Ionization Detectors, Portable TechNote*
- *CBRN SCBA TechNote*
- *Small Package X-Ray Systems TechNote*
- *CBRN Air-Purifying Escape Respirators TechNote*
- *Portable Radiation Portal Monitors Market Survey Report*
- *Extrication Devices Market Survey Report*
- *CBRN Air-Purifying Escape Respirators Market Survey Report*
- *Neutron-Detecting PRDs and Spectroscopic PRDs Market Survey Report*
- *Structural Firefighting Gloves Market Survey Report*
- *Portable Flame Ionization Detectors Market Survey Report*
- *Escape Route Modeling Tools Market Survey Report*
- *Blast Resistant Trash Receptacles Market Survey Report*
- *Radiation Mitigation Blankets Market Survey Report*
- *Bar Code Reading and Printing Equipment Market Survey Report*

These knowledge products are circulated throughout the first responder community, which continuously notes the value of these documents, including the below feedback received from a preparedness program manager from a state Preventive Radiological/Nuclear Detection program working group:

“Please see the attached [Personal Radiation Detectors and] PRD & [Spectroscopic Personal Radiation Detectors] SPRD Market Survey Report by DHS Science & Technology. This is an EXCELLENT and very readable document that compares the existing PRDs and SPRDs currently on the market that are capable of detecting gamma and neutrons.

The preliminary information is very thorough and helps you to understand the science behind the detectors which is critical to being able to see the pros and cons of the various instruments. The charts include not only the specs but also the price.

If you are currently in the market for equipment, this is a MUST read!”



SRD assessment large-area search scenario



SRD mounted in the trunk of a sport utility vehicle

In May 2015, NUSTL conducted an assessment of Standoff Radiation Detectors (SRDs), a type of mobile detection equipment used by first responders to find radioactive sources and identify the radioisotope(s) from a standoff distance. Four SRDs from different manufacturers were assessed against 25 criteria developed in a prior focus group. First responders participating in the assessment included the NYPD, FDNY, Port Authority of New York and New Jersey (PANYNJ), Metropolitan Transportation Authority Police Department, Connecticut State Police, Rockland County Police and Counter Terrorism Operations Support.

In November 2015, NUSTL hosted a focus group on Radionuclide Identification Devices (RIDs) – handheld devices that detect and measure gamma radiation and identify gamma-ray emitting radionuclides. The focus group was facilitated by Scientist John Kada and included first responders from the NYPD, New Jersey State and Transit Police, USCG and PANYNJ. The participants identified criteria by which RIDs are to be evaluated in a forthcoming SAVER assessment, and discussed operational scenarios for evaluating RIDs and criteria for selecting instruments to be assessed.



Scientist John Kada facilitates the SAVER RID Focus Group with local first responders

URBAN OPERATIONAL EXPERIMENTATION



NUSTL conducted the first S&T Urban OpEx in coordination with the NYPD, FDNY, New York City Emergency Management (NYCEM) and the PANYNJ, July 27 – 30, 2015. OpEx brought together first responders of various disciplines from across the nation to experiment with cutting-edge first responder technologies in realistic urban operational scenarios during the three-day event.

Technology evaluators, observers and data collectors included members of the First Responder Resource Group (FRRG) from Massachusetts, Illinois, Maryland, Virginia,



NUSTL Director Adam Hutter presenting the NYPD's Counterterrorism Bureau's Art Mogil with a plaque recognizing the NYPD's contributions to OpEx.



Top left: NYPD Emergency Response Unit officer participates in assessing a mask equipped with Head Up Display technology alongside the technology vendor. Bottom left: NUSTL Director Adam Hutter presenting the NYCEM's Jacob Cooper and Henry Jackson with a plaque recognizing the NYCEM's contributions to OpEx. Top right: FDNY using Internet of Things communication technologies alongside NUSTL's Paul Goldhagen and the technology vendor. Bottom right: FDNY HazMat using Tridion 9, a gas chromatograph mass spectrometer, during day three at Floyd Bennett Field, an NYPD Training Center in Brooklyn, New York.

California and the Washington D.C. metro area; regional first responder agency representatives from the NYPD, NYCEM, FDNY, PANYNJ and the DOHMH; students and faculty from Research and Development Partnerships Group's Office of University Programs Center of Excellence at the Stevens Institute of Technology; and private industry participants including representatives from the Underwriters Laboratory.

S&T's Deputy Under Secretary Dr. Robert Griffin kicked off OpEx at the NYCEM's Emergency Operations Center. Dr. Griffin's opening remarks were followed by first responders experimenting with RepKnight, a social media analysis software that can be used as a consequence management tool.

Subsequent experimentations took place at NUSTL's federal office building facility and the NYPD's training facility at Floyd Bennett Field. In addition to RepKnight, seven other technologies were demonstrated or experimented with during OpEx. Additional technologies included: the Internet of Things, a "Network for First Responders" wireless communication and networking technology to address the problem of communicating in dense concrete structures; two robot technologies, the Knight Robot which was designed to cut holes and insert remote cameras into containers/vehicles, and the X-ray Scanning Rover, which has an x-ray capability

for investigating suspicious packages; two biological agent detectors, BioFlash-E and Fido B2; a Situational Head Up Display, which is an LCD display positioned on a respirator mask; and Tridion-9™, a portable gas chromatograph mass spectrometer for HazMat operations.

OpEx yielded numerous benefits to all participants. It provided first responders the opportunity to experiment with and learn about new technologies that may enhance their mission capabilities, provided developers direct feedback and input to consider when modifying their products to better meet first responder needs, and enhanced S&T's understanding of first responder needs and capability gaps to guide future homeland security investments.

Overall, OpEx was a huge success; NUSTL repeatedly received accolades from DHS Leadership, first responder partners and FRRG members. Additionally, a highlight video was produced by the Office of Corporate Communications and can be found on YouTube.

RESPONDER TECHNOLOGIES TESTING SUPPORT

NUSTL supports FRG's First Responder Technologies (R-Tech) Program by planning and managing the testing of first responder technologies in operational and laboratory settings. NUSTL assesses the capabilities and operational suitability of R-Tech funded solutions to assist in the quick transition of these technologies to the commercial market.

In 2015, NUSTL continued to support the R-Tech Program by conducting two Operational Field Assessments (OFAs). One of the OFAs, Finding Individuals for Disaster and Emergency Response (FINDER) technology, was conducted by NUSTL's New York City office and the second, Electronic Recovery and Access to Data (ERAD) Pre-paid Card Reader, was conducted by NUSTL's Chicago area office. Both OFAs were successful and increased NUSTL's partnerships throughout these regions.

NUSTL Conducted an Operational Field Assessment on Finding Individuals for Disaster and Emergency Response

In February 2015, NUSTL Test Engineer Bhargav Patel conducted an OFA on FINDER in Newark, New

Jersey. FINDER is a tool designed to assist first responders in locating live human victims in disasters through heartbeat and respiration detection.

To be a viable tool for first responders, FINDER must be able to detect human heartbeats and respiration while differentiating humans from animals at standoff distances of tens of meters through walls, doors and rubble. FINDER was tested against these requirements in several operational environments over the course of three



Newark Search and Rescue Firefighter operating FINDER on a rubble pile to locate victims during the OFA.

days. The primary operators were the search and rescue groups of the Newark Fire Department and the Emergency Services Unit of the Newark Police Department. Other participants included the Newark Office of Emergency Management and the Federal Bureau of Investigation Newark Field Office. FINDER was tested in six different environments which were intended to represent different scenarios, each with their own unique set of differences and complexities.

The assessment was designed to quantify false negative rates (people are present but FINDER did not detect anyone), false positive rates (no one is present but FINDER detected someone), and undercounts (FINDER detected less people than were present) as different types of failure modes.

NUSTL Conducted an Operational Field Assessment for the Electronic Recovery and Access to Data Pre-paid Card Reader



A law enforcement officer performs a balance inquiry on an open-loop card during a simulated daylight vehicle stop.

NUSTL conducted an OFA on the ERAD Pre-paid Card Reader in April 2015. To assist local law enforcement with countering money laundering, the ERAD Pre-paid Card Reader can be used to quickly obtain balance information on pre-paid cards and allow for immediate action, such as balance inquiries, freezes and seizures on any questionable activities.

The OFA, led by NUSTL Physicist Gladys Klemic and supported by NUSTL staff members Kris Dooley, Bhargav Patel and Steve Vargas, assessed the ERAD's functionality, usability, interoperability and security. Policy and legal concerns were also analyzed and discussed. Nine law enforcement officers from the Chicago area participated, representing different types of operations at the state and local level, including undercover operations, drug enforcement, intelligence and postal investigations. The OFA was held at NUSTL's Chicago Metropolitan area office with the DHS Homeland Security Investigations Chicago Field Division Office of the Special Agent in Charge.



A law enforcement officer utilizes the Virtual Terminal to freeze funds on an open-loop card during a simulated low light vehicle stop.

PERFORMANCE TESTING AND EVALUATION AT NUSTL

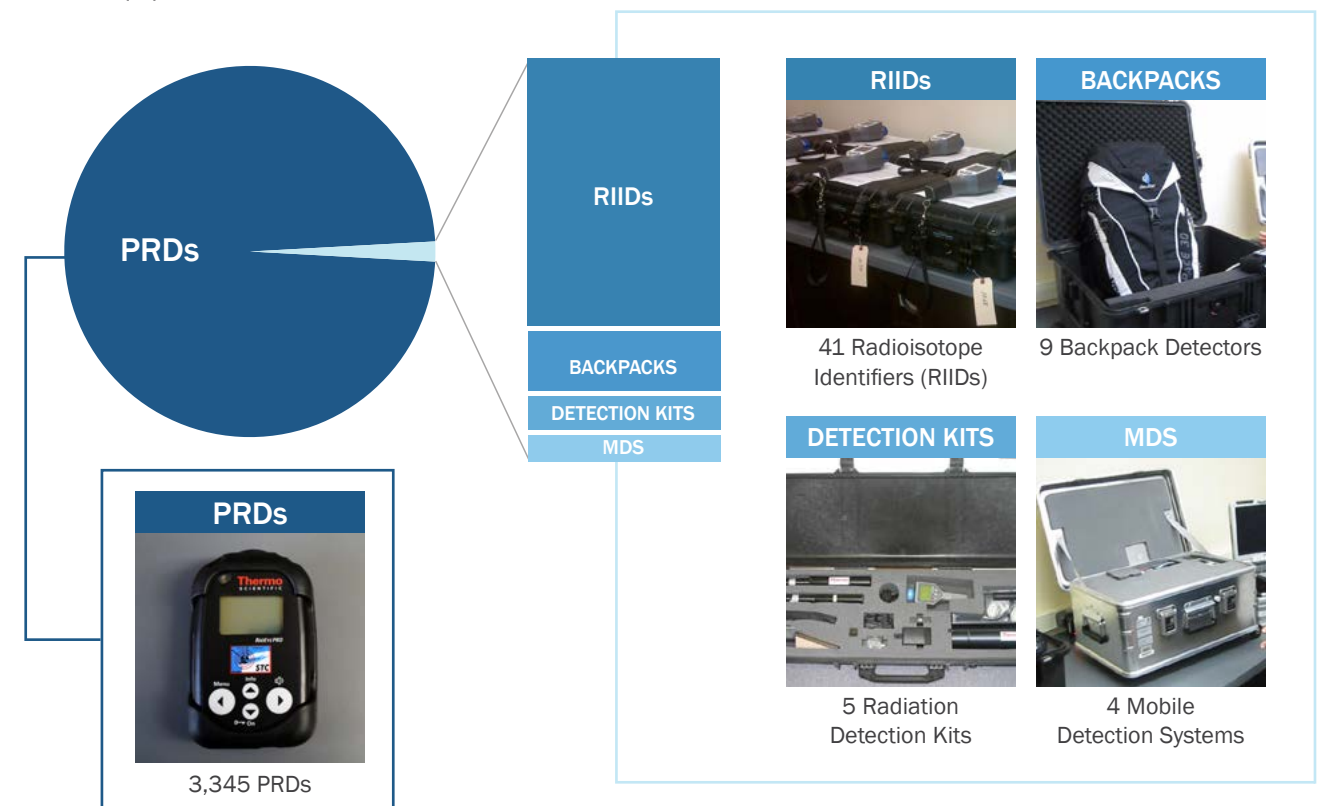
NUSTL's Performance Test and Evaluation (PTEN) Program conducts functional tests of first responder equipment to ensure operational readiness of deployed units. As part of this program, NUSTL directly supports the numerous state and local responder agencies that participate in DHS Domestic Nuclear Detection Office's (DNDO) Securing the Cities (STC) initiative. NUSTL conducts functional tests of all new equipment purchased under STC grant funds under a Memorandum of Understanding with NYPD. The tests conducted by NUSTL help to ensure equipment meets performance specifications prior to being deployed throughout the region.

2015 was another stellar year for the PTEN program providing direct support to 12 primary agencies, that in turn have agreements with more than 150 regional agencies that deploy equipment tested by NUSTL. Since the PTEN program started, our total number of radiation detection units individually tested has totaled 16,352. Our partners consistently seek out our support and expertise, which has been made evident by feedback received from our partners, including NYPD Sergeant Detective Mark Teitler, who stated:

"As the NYPD's primary testing facility for CBRNE equipment, NUSTL is head and shoulders one of the most professional organization's I have dealt with."

In 2015, NUSTL received, tested and deployed 3,404 radiation detectors for the STC program in the New York City region.

The equipment included:



The STC program also executed a refresh to all of the region’s personal digital assistants (PDAs) used to interface, display and store data wirelessly from the backpack detectors. This purchase included 196 PDAs along with accessories and car mounts for the regional partners.

The PDAs were individually tested with a backpack detector at NUSTL to ensure proper function of the wireless capability and successful installation of the vendor software for data transmission and visualization. NUSTL also received another 126 PRDs and 12 backpack detectors that were tested in 2015 but were not deployed within the year’s timeframe. Additionally, NUSTL delivered 615 PRDs and 4 RIIDs to partners that were tested at the end of 2014.

Through the STC program, NUSTL tests equipment for many tristate area first responder organizations. In 2015, NUSTL staff tested equipment for the following first responder partners:



- Connecticut State Police
- New York City Department of Environmental Protection Police Department
- New Jersey State Police
- NYPD
- Nassau County Police Department (New York)
- New York State Division of Homeland Security and Emergency Services
- PANYNJ Police Department
- Rockland County Sheriff’s Office (New York)
- Suffolk County Police Department (SCPD) (New York)
- Westchester Police Department (New York)
- Metropolitan Transportation Authority Police Department (New York)

PTEN strives to continuously refresh the program with new procedures, processes and technology. This year Property Manager Robert Stocco collaborated with Program Manager Ethel Davis to implement new scanning technology that has enhanced NUSTL’s capability to track PTEN incoming shipments. The scanning technology improves the efficiency of NUSTL’s check-in process for radiation detection equipment.

As part of PTEN’s continuous improvement, the program disseminated an “Equipment Testing Satisfaction Survey” to all STC partners in October 2015. This survey provided partners with the opportunity to express their opinion on NUSTL’s test and evaluation services. The survey results also provided NUSTL with insight on how the program could be enhanced. Positive feedback has been received thus far, including the below message from the New York State Department of Environmental Conservation Police.

“Having NUSTL conduct initial testing on [prevention radiological and nuclear detection] PRND equipment has been a tremendous help. Generally speaking, I am confident to issue out PRND equipment directly that has been checked by NUSTL. The same cannot be said about some equipment delivered from manufacture[r]s.”

– T/Sgt. Walter Maloney

PTEN also had the opportunity to reach outside the STC program. In September 2015, the PTEN program supported New York City’s radiological and nuclear detection security efforts leading up to the arrival of Pope Francis. At the request of the Amtrak Police Department, NUSTL tested and coordinated the transfer of radiation detection equipment to Amtrak law enforcement officers for their use during the Papal visit from September 24 – 26, 2015. The equipment transferred included two backpack detectors and fifteen PRDs.

Pope Francis’ visit was declared a National Special Security Event, which called for increased coordination and security efforts among local, state and federal partners to establish a safe and secure environment. The Amtrak Police Department is one of many first responder organizations to utilize PRDs and other radiation detection equipment tested by NUSTL.

We look forward to expanding our footprint and continuing to provide exceptional support in the first responder community in 2016.



Transfer of equipment to Amtrak Police Department.

RESPONDER TRAINING AND EXERCISE SUPPORT FOR SECURING THE CITIES

NUSTL established its Responder Training and Exercise (RTE) Program in 2009 to support DNDO's STC program. STC is a cooperative federal, state and local program that seeks to design and implement architecture for coordinated and integrated detection and interdiction of illicit radiological materials that may be used as a weapon. STC aims to prevent radiological or nuclear attacks on high-risk urban areas by helping local and state responder agencies detect and interdict illicit radioactive and nuclear material. RTE assists first responder agencies in the New York City metropolitan area with their radiation detection training sessions and exercises developed under the STC program.

In 2015, NUSTL staff members Brian Albert, Andy Chen, Norman Chiu, Karin Decker, Paul Goldhagen, Matthew Monetti, Carl Schopfer, Robert Stocco and William Van Steveninck supported the RTE program. The RTE team provided radiation sources, training materials and technical support to seven agencies, facilitating five training events and training more than 130 recruits and officers.

RTE supported four PRD Training courses for SCPD at the SCPD Training Academy in Brentwood, New York; the courses focused on the use of person-worn radiation detector devices. These training courses included participants from the SCPD, the Suffolk County Sheriff's Office, the Stony Brook University Police Department and the Hempstead Police Department.

NUSTL also provided support for one Radiation Detection Training course for the PANYNJ Police Department at its Training Academy in Jersey City, New Jersey. Additionally, through the STC program, NUSTL provided backpack radiation detector student guides to the New Jersey State Police that were used to facilitate a training session with the Middlesex County Fire Academy in Sayreville, New Jersey.



Suffolk County Police recruits learn how to search for radiation sources in a vehicle.



NUSTL engineer Norman Chiu places a radioactive source into a mannequin during a training event that focuses on suspect searches.



Suffolk County Police Department participants learn detection equipment response to radioactive sources.



Port Authority of NY and NJ officer trainees train to search a parking lot.

Since 2009, NUSTL has supported training and exercises for more than 1,500 state and local first responders. To ensure that the best services are provided to our first responder partners, the RTE team is regularly trained on all applicable standards and regulations.

RADIOLOGICAL EMERGENCY MANAGEMENT SYSTEM

The REMS is a network of gamma radiation sensors that provides real-time citywide data for response and recovery from a radiological or nuclear event. REMS was designed at NUSTL and field-tested over the course of five years. Through a cooperative research and development agreement, the REMS concept and design was commercialized, enabling the NYPD and other first responder agencies to purchase the system in the commercial marketplace. The NYPD implemented the commercialized system and REMS is now fully operational in outdoor locations throughout the New York City metropolitan area.

Installation at Grand Central Terminal

In April 2015, NUSTL installed two REMS sensors in Grand Central Terminal (GCT). Although the REMS network is currently deployed throughout New York City in outdoor locations, this GCT installation is the first of its kind in the nation at an indoor major transportation hub. These sensors alert officials of the Metropolitan Transportation Agency (MTA) and Metro North Railroad to the release of radiation or the presence of a strong radiological source at GCT. In addition to detecting high radiation levels, REMS also distinguishes real threats from innocent alarms, such as those caused by medical patients who were treated with radioactive materials. Data streams and alarms are monitored by the MTA, and data is periodically checked for validity by scientists at NUSTL.

This REMS installation is part of NUSTL's Radiological Incident Awareness System and Concept of Operations (CONOPS) Development project. This project assists the MTA in the development of a CONOPS for monitoring its infrastructure to respond to radiological incidents. While the MTA currently deploys sensor technology to detect chemical, biological and radiological threats, they are always looking to improve their operational plans and expand their capability to respond to incidents in their terminal.



Engineer Brian Albert installing REMS sensors at Grand Central Terminal.

New Sensor Selected



Aerial view of the RadHalo

The NYPD selected an improved sensor for the REMS network in May 2015 as part of an acquisition process that included specifications jointly developed by NUSTL and the NYPD. Issues with the previous model sensor were discovered during quality assurance testing performed by NUSTL, including radiation measurement ranges that were not high enough, no over-range indication, and radiation dose rate accuracy that did not meet the vendor's stated specifications. The new sensor, a specialized version of the RadHalo commercial product, met all specifications when tested for radiological performance. After passing network connectivity testing in the fall of 2015, the NYPD will install the new sensors at sites throughout New York City as part of the REMS network in 2016. New sites will be added and the previous model will be phased out at all existing sites. NUSTL will perform acceptance testing on all new sensors prior to installation.

NEW YORK CITY FIRE DEPARTMENT COMMUNITY RECEPTION CENTER TECHNICAL SUPPORT

NUSTL supports a Memorandum of Agreement (MOA) between DHS S&T FRG and the FDNY by providing test and evaluation and technical advisory services. The purpose of the MOA is to improve the development of technologies and increase knowledge to enhance the safety and effectiveness of first responders.

Under this agreement, NUSTL provided technical expertise to the FDNY on community reception center planning. This New York City capability would be used to screen large numbers of citizens in the event of a radiological incident. The FDNY has the task to set up a number of radiation portal monitors and staff the center at preselected locations such as public schools when necessary.



FDNY providing finishing touches on radiation portal monitors during the community reception center mock deployment event.

NUSTL was asked to consider approaches that would allow this effort to be conducted with the highest efficiency given the resources expected to be available. The laboratory borrowed a personnel radiation portal monitor from the FDNY to gain a better understanding of the operation and response of the system to assist in the development of feasible approaches.

On February 28, 2015, five NUSTL employees attended a mock deployment of the community reception center at the 69th Regiment Armory in New York City. This was the first time the FDNY staged the equipment as intended for a radiological response; they sought our observations and proposed corrective actions to improve their operations. NUSTL used this opportunity to exchange further information with the FDNY and other agencies involved to help refine the overall approach.

DOMESTIC NUCLEAR DETECTION OFFICE TEST AND EVALUATION, RADIATION AWARENESS AND INTERDICTION NETWORK ADVANCED TECHNOLOGY DEMONSTRATION SUPPORT

NUSTL continued to assist DNDO in the development of a system known as Radiation Awareness and Interdiction Network (RAIN) by serving as a liaison between DNDO, the NYPD and other New York City responders, and participating in RAIN meetings and events. A RAIN system is intended to provide a new capability for high confidence, high-precision detection, identification and localization of vehicle-borne radiological or nuclear threats in free-flowing traffic. New York City is intended as an operational test bed for the RAIN systems. DNDO has established contracts with three vendors (GE Global Research, Passport Systems Inc. and Physical Sciences); two design and build RAIN systems, each with a distinct approach.

At the start of 2015, NUSTL assisted in a data collection effort at the PANYNJ George Washington Bridge and Lincoln Tunnel. NUSTL monitored the Lawrence Livermore National Laboratory's (LLNL) radiation detection systems to ensure they were functioning properly during the deployment. The systems collected background data on radiation signatures of vehicles transiting into New York City to assist in the development of RAIN.

NUSTL participated in several additional RAIN activities in 2015, including progress review meetings to track the progress of the work and address any existing issues. NUSTL attended preliminary design review meetings for each of the three vendors during the week of February 9, 2015, at the vendors' facilities. These meetings concluded Phase 1 of the RAIN development. All vendors were authorized to continue onward to Phase 2 to complete their design. On March 27, 2015, NUSTL participated in a meeting to present the NYPD



Lawrence Livermore National Laboratory's radiation monitoring equipment located above lane 8 at the New York bound upper level toll plaza of George Washington Bridge during the data collection effort.



Lawrence Livermore National Laboratory's radiation monitoring equipment placed at the New York bound entrance of the south tube of the Lincoln Tunnel during the data collection effort.



with the status of RAIN development and initiate discussions on an operational assessment of systems. During the week of September 14, 2015, DND0 held critical design reviews of RAIN systems. All three vendors are now developing prototypes for characterization testing that will help evaluate whether systems meet the performance requirements.

Following the critical design reviews, NUSTL focused on planning the government characterization of prototypes that would take place late in 2016 to early 2017. NUSTL remains a resource to assist in this DND0 program and expects to take a more active role for planning operational testing in New York City.

NEUTRON BENCHMARKING

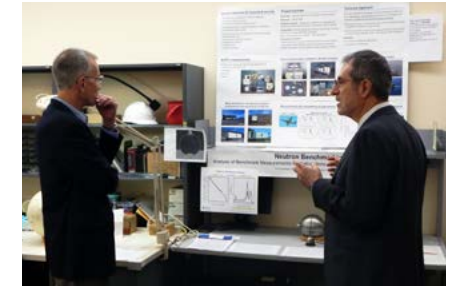
Throughout 2015, Physicist Paul Goldhagen continued to use his expertise to analyze the laboratory's measurements of cosmic-ray background neutrons and finalized long-term measurements of background neutrons. Additionally, Goldhagen served as a trusted federal technical resource on neutron measurements and cosmic rays to federal agencies, national laboratories, universities, standards committees and private industry. For example, he served on the External Advisory Committee of the Columbia College of Physicians and Surgeons Radiological Research Accelerator Facility and the working group revising American National Standards Institute (ANSI) N42.32: American National Standard Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security.

Goldhagen has been collaborating with scientists at the Los Alamos National Laboratory (LANL) and the University of Delaware (UD) to understand variations in the



NUSTL Physicist Paul Goldhagen disassembling the largest of the 16 detectors of the Laboratory's extended-range multisphere neutron spectrometer after completing the long-term measurement of background neutrons made on NUSTL's roof.

neutron background to aid scientists and engineers designing and deploying systems to detect nuclear threats. The collaboration has developed detailed calculations of background neutrons on a global matrix of locations. NUSTL has made many measurements of the intensity and energy distribution of cosmogenic neutrons on airplanes, ships and land, and continues to analyze the measurements to benchmark, correct and verify the calculations.



DND0 Deputy Director Dr. Wayne Brasure (left) is briefed on Neutron Benchmarking by NUSTL Physicist Dr. Paul Goldhagen (right).

NUSTL Completes Long-term Measurement of Background Neutrons

NUSTL has been collecting data for more than three years to measure how the intensity and energy of neutrons produced by cosmic rays vary with solar magnetic activity, air pressure, time of day and other influences. The long-term measurement was made on NUSTL's roof using a NUSTL-designed, extended-energy, multisphere neutron spectrometer with 16 separate neutron detectors weighing from 1 to 400 pounds. The measurement lasted long enough for the sun's magnetic activity to change enough for its influence to be determined.

Neutron Mapping Informational Meeting



At the request of the National Geospatial-Intelligence Agency, NUSTL Physicist Paul Goldhagen hosted a meeting to share information on background radiation that interferes with detection of hidden nuclear threats.

At the request of the National Geospatial-Intelligence Agency, Goldhagen hosted a meeting on December 10, 2015, to share information on background radiation that interferes with detection of hidden nuclear devices and materials. The meeting focused on background neutron radiation produced by cosmic rays and how these neutrons vary with location and time. The purposes of the meeting were to share information on recent measurements and calculations of the rate and energy of cosmic-ray-produced neutrons, and identify steps toward producing an accurate dynamic global map of background neutrons. Briefings were presented by Goldhagen and scientists from LANL, UD, Naval Research Laboratory, Ultralytics LLC and the National Institute of Science and Technology.



▼ RESEARCH AND DEVELOPMENT

RADIOLOGICAL/NUCLEAR RESPONSE AND RECOVERY RESEARCH AND DEVELOPMENT

In 2015, NUSTL's RNRR R&D portfolio allowed program managers to initiate, support and complete impactful projects that aided state and local response capabilities and bolstered partnerships with first responders, radiological SMEs and other agency representatives to ensure coordination of tools and resources being developed. These efforts supported the three primary goals of NUSTL's RNRR R&D portfolio:

- Increase capability at all levels of government to manage and characterize complex and catastrophic radiological and nuclear incidents.
- Improve responder ability to save lives during the initial response operations of a radiological incident.
- Minimize impact to community and economy through improved methods of incident stabilization, radiological clean up and recovery.

The RNRR program facilitated the demonstration and adoption of new tools and resources for first responders; led the effort to define necessary skills for a new emergency response position; completed foundational research on game-based training; collaborated with partners to initiate five new projects; and continued to advance R&D in seven projects already underway from previous years.

FACILITATING DEMONSTRATIONS OF TOOLS TO IMPROVE FIRST RESPONDER CAPABILITIES

The ability for first responders to physically interact with new tools and technologies during the development state is critical to their acceptance and integration of new resources into their emergency response and recovery missions. In 2015, NUSTL facilitated the opportunity for first responders and agency representatives to directly test and evaluate technology, operational resources and tools being developed through the RNRR Portfolio.

- In 2015, New York City and Philadelphia, Pennsylvania, two large Urban Area Security Initiative (UASI) cities, began piloting NUSTL authored planning guidance, titled, "Science-based Response Planning Guidance for the First 100 Minutes of the Response to a Radiological Dispersal Device (RDD) Detonation," developed under the RNRR portfolio in partnership with the DOE's Brookhaven National Laboratory and Sandia National Laboratories. First responders and local, state and federal agency representatives from each city participated in full-day sessions in each of the jurisdictions to learn from DOE scientists about the realistic consequences of an RDD detonation and begin using the RNRR-developed planning guidance to expand and create their own response protocols to an RDD detonation. This pilot process will continue into 2016 in New York City and Philadelphia, and expand to two additional UASI locations in 2016, with the goal of the planning guidance being used by municipalities across the country to develop RDD response protocols. Vetted and validated through an interagency peer review in June 2015, the planning guidance is being piloted by NUSTL to integrate feedback and best practices from interagency partners and first responder customers.
- In June 2015, NUSTL and the EPA hosted a Wide-Area Urban Radiological Containment Mitigation and Clean-up Toolbox of Technologies demonstration in Columbus, Ohio. Recognizing the need for agencies to understand the cleanup options available for quickly



The EPA's United States Public Health Service Captain John Cardarelli II presents information on the Radiation Decontamination Tool.



FDNY Battalion Chief Tim Rice beta testing the Radiation Decontamination Application.

dealing with radiological events of all sizes, first responders were able to see firsthand how technologies can support their efforts for contamination containment and gross decontamination of infrastructure and vehicles. Participants in the demonstration included representatives from local and state first responder agencies, federal agencies and international partners. The technologies demonstrated in Columbus were first researched and laboratory tested by EPA researchers.

LAYING THE FOUNDATION FOR RADIOLOGICAL EXPERTISE WITHIN AN EMERGENCY RESPONSE

In 2015, NUSTL's RNRR division teamed up with FEMA and the DOE National Nuclear Security Administration (NNSA) to create a soon-to-be typed National Incident Management System position called the Radiological Operations Support Specialist (ROSS). The purpose of the ROSS is provide expertise in advanced principles of health physics and radiological safety to fire, police and other first responders to increase their ability to safely and effectively conduct their missions and protect the public during a radiological emergency.

NUSTL's RNRR team worked with LLNL, to identify the skills, knowledge and abilities (SKAs) needed by potential ROSS candidates. The team developed a catalog that identified existing interagency training and courses in emergency management response and radiological and health physics topics and compared it to the SKA requirements. This crosswalk comparison between existing training and SKA requirements serves as the foundation to develop specific position requirements for the ROSS program.

In 2016, the interagency team will plan the first ROSS course content, identify candidates and coordinate with FEMA's Center for Domestic Preparedness to hold the first course.



Columbus first responders demonstrating decontamination techniques using foam during the Wide-Area Urban Radiological Containment Mitigation and Clean-up Toolbox Technologies demonstration.

RESEARCHING THE VIABILITY OF IMPROVING EMERGENCY MANAGERS' DECISION-MAKING SKILLS THROUGH GAME TRAINING

In 2015, researchers at the Department of Defense's Massachusetts Institute of Technology Lincoln Laboratory (MIT-LL) assisted DHS S&T in better understanding which first responder decision making skills can be transferred successfully from a virtual training regimen (i.e., video games) into real-world response operations. The MIT-LL team submitted reports and results of interviews and a focus group that analyzed decision-making skill characteristics and the differences between real-world and models for government-industry collaboration in digital learning. The team also developed two fully playable game prototypes, one of which focuses on resource allocation during an Improvised Nuclear Device (IND) detonation response to minimize public exposure to dangerous radiation levels using finite resources as an example of a game that can target decision-making skill improvement.

This project was a joint effort by NUSTL and FEMA. NUSTL financed the initial research tasks while FEMA will support the development of operational planning and implementation recommendations, which are based on the initial research findings.

INITIATING AND CONTINUING INNOVATIVE RNRR R&D PROJECTS TO SUPPORT LOCAL AND STATE RESPONDER CAPABILITIES

The portfolio's 12 ongoing R&D projects work toward addressing operational capability gaps first responders face when responding to radiological or nuclear emergencies.

New Projects

During 2015, projects in the RNRR R&D portfolio expanded existing partnerships and fostered new relationships. The team initiated new projects focused on increasing responder capabilities to coordinate critical incident decision making using existing and emerging technology. As the portfolio continues to expand, NUSTL works hard to ensure that each newly initiated effort connects to existing radiological response programs and tools, ensuring coordination between interagency projects and partnerships. In total, the RNRR R&D portfolio increased by five new projects in 2015.

- **Development of Organic Radiochromic Compounds for First Responder Visual Confirmation of Radiation Exposure:** The Savannah River National Laboratory engineered and bench tested an organic radiochromic compound that can be applied to or integrated into equipment used by first responders to promptly visually recognize the presence of radiation.
- **GammaPix Testing:** NUSTL and Brookhaven National Laboratory tested GammaPix software, a technology that allows video cameras to operate as radiation detectors to support the NYPD in its radiation detection efforts.
- **Emergency Worker Dosimetry Guidelines for Radiological Emergencies:** The National Council on Radiation Protection and Measurements (NCRP) provides scientific justification and actionable guidance to response agencies at all levels of government on how to conduct emergency dosimetry during a radiological response to ensure the safety and health of first responders and agency personnel. The

NCRP's research focuses on methods to minimize exposure and provide emergency dosimetry to measure dose received and record dose for emergency responders and emergency workers who are not normally considered radiation workers.

- **Guidance for First Responder use of Preventive Radiological/Nuclear Detection Equipment for Performance During Consequence Management Operations:** A team of scientists across the DOE's National Laboratories researched, evaluated and tested first responder PRND equipment to provide state and local agencies with guidance on how to use detection and interdiction equipment for consequence management and response and recovery missions after a radiological or nuclear incident.
- **Fast Running Urban Dispersion Model for Radiological Dispersal Device Releases:** This project expanded upon existing modeling capabilities at LLNL and the National Atmospheric Radiological Advisory Center for radiological incidents in urban environments.

Existing Projects

Work also continued on a number of exciting projects, which originally established the RNRR R&D portfolio. The goal of these projects is to meet the needs of first responders in saving lives, protecting the public and minimizing the incident impact of a radiological emergency. The multi-year lifespan of most of the portfolio's projects allows NUSTL extensive opportunities to engage and support our first responder customers and interagency partners. Some of these critical project advancements include work in:

- **Gross Decontamination and Waste Management Technology:** NUSTL has partnered with the EPA to develop a first responder field tool providing guidance on techniques, procedures, and use of common/available equipment to reduce and control contamination following a radiological incident, minimizing exposure hazards to responders and citizens.
- **Scientific Guidance and Preparedness Support for RDD Response and Recovery:** The laboratory has been developing tactical recommendations and actionable planning guidance for state and local response to an RDD detonation by leveraging previous scientific works of Brookhaven National Laboratory and Sandia National Laboratories and partnering with UASI cities serving as pilot cities.
- **Expansion of Turbo Federal Radiological Monitoring and Assessment Center (FRMAC) for State/Local Agency Use:** NUSTL is working with Sandia National Laboratories to expand radiological data management and modeling software, currently used by specialized federal teams, to state and local response agencies. The project team is refining the tool to include building protection factors, new user training and a cloud-based solution for distributing tools to state/local users.
- **Local Radiation Planning Job Aid and NNSA Support to First Responders:** NUSTL is authoring a print and online handbook for state and local ROSS candidates detailing key guidance and field operational job tools, including specific forms to help the ROSS program ensure radiological protection and safety is integrated into the incident command system planning process. This project also includes meeting the technical requirements of moving the Turbo FRMAC tool into the cloud.

- **GCT Radiological Incident Awareness System and CONOPS Development:** This project focuses on providing capability to the MTA Metro North Railroad to alert them to the presence of radiation during an emergency response through the installation of REMS units in GCT. NUSTL is assisting the MTA in developing a CONOPS for equipment use and performance metrics and test parameters.
- **State and Local Support to Radiological/Nuclear Emergency Planning and Response Procedures:** NUSTL is working with LLNL to improve the fidelity of modeling algorithms currently used for predicting dispersion in various environments, and developing technical requirements and recommendations for a rapid consequence assessment and decision support tool.
- **Research on Improving IND Decision Making through Virtual Training Skill Transfer:** NUSTL is supporting MIT-LL in cataloging emergency decision making requirements during an IND, and understanding what skills can be directly transferred from virtual training/video games into real-world performance.



Test Engineer Brian Albert testing GammaPix technology at Brookhaven National Laboratory.



▼ QUALITY MANAGEMENT

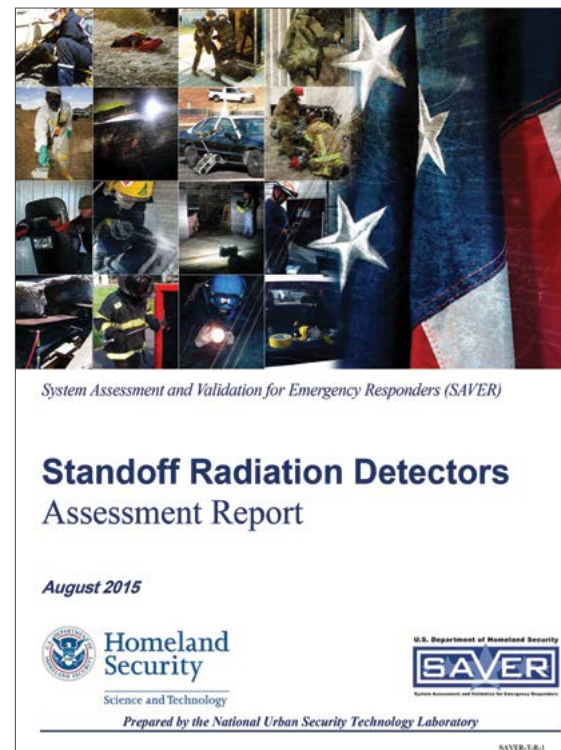


In 2015, NUSTL furthered its goal of certifying its Quality Management System (QMS) with the International Standards Organization (ISO) 9001:2015 standard. NUSTL developed laboratory-wide policies, standard operating procedures, manuals, plans, work instructions and other documentation to more effectively manage its business and to ensure it consistently delivers high quality products and services to its first responder customers – hallmarks of a robust and certifiable QMS.

NUSTL has more than 75 documented procedures and work instructions that aid in its day-to-day operations. NUSTL's QMS also tracks over 300 NUSTL developed documents including NUSTL's many technical reports that are provided to first responders such as TechNotes, Market Survey Reports and Experimentation Reports.

A key component of NUSTL's QMS is NUSTL's policy of continuous improvement. In 2015, NUSTL developed a formal procedure to ensure the laboratory consistently and systematically obtains feedback from its staff members and customers alike to aid in the improvement in the laboratory services, products and operations. Through NUSTL's QMS, staff and customers can offer new ideas, lessons learned and feedback to NUSTL leadership in both formal and informal methods to effect change at the lab, with the goal of achieving a rising standard of quality in all that NUSTL does.

Also in 2015, portions of NUSTL's QMS underwent both internal and external audits. First, the S&T Asset and Logistics Management Branch audited a sampling of NUSTL's personal property inventory and reviewed the program documentation developed in accordance with NUSTL's QMS. The audit was highly successful as no nonconformities were identified. NUSTL also performed an internal audit on its Records and File Management Policy and Procedure which demonstrated NUSTL's commitment to ensuring its adherence to laboratory policy and regulatory requirements.



SAVER and Urban OpEx Reports featuring quality tracking numbers. Each document was processed in accordance with NUSTL's QMS as well as the ISO 9001:2015 standard.

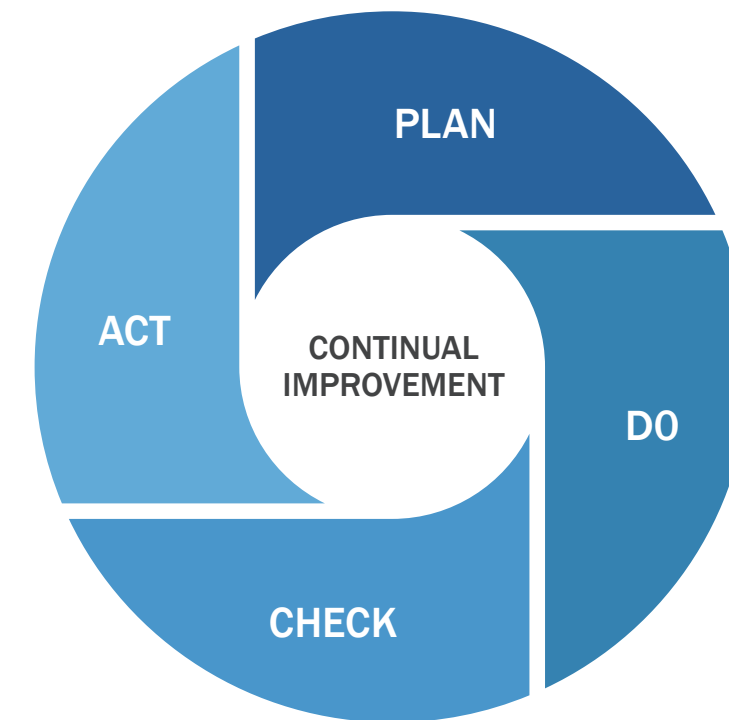


▼ SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT SYSTEM

The Safety, Health and Environmental Management System (SHEMS) was created to assist NUSTL's facility with the management of its environmental and safety related activities in accordance with federal, state and local regulations.

NUSTL's SHEMS continued to be suitable, adequate and effective for its intended purposes at NUSTL. In May, Director Adam Hutter certified this during the 2015 SHEMS Management Review (SMR), which was attended by the Administrative Division Director Alfred Crescenzi, who also serves as the SHEMS Coordinator, Radiation Safety Officer Carl Schopfer, Internal SHEMS Auditors Kris Dooley and Christian Madera, S&T Acting Chief Administration Officer Ian Rosenblum, Occupational Safety Environmental Programs Environmental and Safety Health Professionals Christopher Keefer and Ted Mitchell, as well as SMEs Joe Cascio and Nicole White.

During the SMR, Crescenzi presented the outcomes, status and progress made towards achievement of the SHEMS objectives and targets for risk reduction, and opportunities for improvement identified during the previous year's internal and second-party audits. Crescenzi showed how the SHEMS conforms to the requirements of ISO 14001 and American National Standards Institute / American Industrial Hygiene Association Standard Z10 for Environmental Management Systems and Occupational Health & Safety Management Systems, respectively. Cascio highlighted the internal audit conducted by NUSTL, congratulated the team on a job well done and informed the group that NUSTL has become the benchmark for all S&T laboratories.



In preparation of the annual SHEMS Second-Party Audit, Management Analyst Kris Dooley, Facility Assistant Christian Madera and Mechanical Engineer Cecilia Murtagh conducted an internal audit of the SHEMS Program. The purpose of the audit was to determine the facility's knowledge and awareness of the SHEMS and compliance with applicable federal, state and local Environmental, Safety and Health (ESH) laws and regulations; evaluate conformance to applicable internal policies and programs including appropriate DHS directives; and assess the design and effectiveness of specific management systems that have been created to help manage NUSTL's regulatory obligations.

The Internal Audit Team concluded there were no instances of non-conformance, but they did identify three opportunities for improvement that could enhance the SHEMS Program. This included updating the SHEMS filing structures, increasing awareness of the Cross Functional Team and updating the SHEMS Program Document that outlines SHEMS' activities, staff roles and responsibilities, and applicable regulations and requirements.

Following the internal audit, Crescenzi conducted a training session focused on "SHEMS Awareness and the Occupational Safety and Health Risk: Material Handling and Safety Awareness" to prepare staff for the SHEMS Second-Party Audit. Throughout the training, Crescenzi emphasized the importance of each staff member's role in the SHEMS Program, and how it pertains to NUSTL's policies, procedures and sustainability practices.

Crescenzi also held an additional training session for Operational Management Program (OMP) leads. OMPs are a management tool used to document tasks, responsibilities and operational details implemented to achieve objectives and targets to mitigate or remove significant environmental aspects and worker health and safety risks. During the training session, Crescenzi reviewed specific responsibilities related to the significant aspects and hazards identified in their respective OMPs and address questions from the leads.



▼ PERSONAL PROPERTY MANAGEMENT

Throughout 2015, NUSTL continued its efforts in property management and environmental sustainability by donating, selling and recycling excess property, valued at more than \$42,000. Activities are highlighted below.

DONATIONS

- NUSTL donated one laptop to the Chicago School District through the Computers for Learning Program. *April 2, 2015.*
- The laboratory donated one acoustic anemometer and its associated field electronics to Bergen County Academics in Hackensack, New Jersey. *October 15, 2015.*
- Fourteen door closers were donated to the Grafton Job Corps Center in Grafton, Massachusetts. *November 10, 2015.*
- NUSTL donated one aerosol sampler storage cabinet to the Lamont-Doherty Earth Observatory of Columbia University in Palisades, New York. *December 21, 2015.*

SALES

- The laboratory sold one document scanner to Vera Security in South Ozone Park, New York, through General Service Agreement (GSA) sales. *August 7, 2015.*
- NUSTL sold two computers to Cold Ground Transport LLC through GSA sales. *September 29, 2015.*

RECYCLING

- More than 420 pounds of small electronics were recycled through an Earth Day FedCap Recycling event at the Varick Street Federal Office Building. Facility Assistant Christian Madera and Property Manager Robert Stocco led NUSTL's participation in the event. *April 22, 2015.*
- Six specialized laptops were recycled through the United States Postal Service's BlueEarth Program's Green Recycling Service. *June 5, 2015.*

 Green Recycling Management LLC	
Certificate of Recycling	
ISSUED TO:	DHS/S&T/NUSTL National Urban Security Technology 201 Varick Street, Room 900 New York, NY 10014
DATE RECEIVED:	April 21, 2015
DATE PROCESSED:	April 22, 2015
REFERENCE:	FEDCAP RECYCLING EVENT
DESCRIPTION:	427 LBS OF SMALL ELECTRONIC EQUIPMENT
TOTAL:	427 LBS OF WASTE RECYCLED
<small>Any and all hard drives shredded and destroyed</small>	
<small>E-Green Recycling Management, LLC hereby certifies that it has received all referenced materials above and certifies that all materials have been recycled or will be recycled in accordance with all applicable Federal, State and Local Laws and Regulations.</small>	
	
<small>This certificate certifies that the information contained in or accompanying this document is true, accurate and complete as to the identification of the materials received from the waste generating company and the processing of the waste in accordance with the United States Environmental Protection Agency and the New York State Department of Environmental Conservation's waste management Laws and Regulations.</small>	
e-Green Recycling Management, LLC 140 Corporate Drive Holtsville, NY 11742 Tel: (631) 277-4283	

Certificate of Recycling presented to NUSTL documenting their participate and total pounds of electronic waste recycled during FedCap's Earth Day event.

FORMER NUSTL FACILITY LABORATORY SPACES BEFORE AND AFTER DECOMMISSIONING AND DECONTAMINATION

▼ DECOMMISSIONING AND DECONTAMINATION

In 2015, NUSTL worked with various S&T offices and the building owner, GSA, to finalize the free release of NUSTL's former facility, which was occupied by the lab from 1959 until 2013. Throughout 2015, Administrative Division Director Alfred Crescenzi led the effort at NUSTL to finalize the decommissioning and decontamination of the former NUSTL facility located on the fifth floor of the Varick Street federal office building. These activities included the demolition and disposal of all contaminated duct work in accordance with the GSA Heavy Metal Pipe & A/C Duct Demolition and Disposal Plan, and multiple meetings between the DHS S&T ONL, NUSTL and GSA.

In September 2015, DHS S&T ONL and NUSTL representatives held a close-out meeting with GSA's Portfolio Management Strategy Division and Safety and Environmental Branch to review the "Final Decommissioning Report Addendum for the Fifth Floor 201 Varick Street." The meeting resulted in a unanimous vote to accept the report, which was the final action required by the GSA Interagency Agreement with DHS entitled, "Action Plan Agreement." As of October 2015, all required action items mandated in the "Action Plan Agreement" were completed, resulting in the free release of the space back to GSA, thus terminating NUSTL's rental agreement and any responsibility or liability for the space.



Static Electricity Shielded Room before.



Static Electricity Shielded Room after.



Radon Chamber before.



Radon Chamber after.



Anti-Coincidence Shield before.



Anti-Coincidence Shield after.



▼ TRAINING

Throughout 2015, NUSTL participated in and hosted a number of training activities on financial services, export controls and SHEMS.

FINANCIAL SERVICES BRANCH (FSB) TRAINING

In May 2015, the S&T FSB representatives traveled to NUSTL to present on the capabilities of the FSB. They provided an overview of the organization’s mission and goals. Additionally, SMEs presented on the services and capabilities regarding S&T Travel, Conference Management and the Bankcard Program. This training was extremely beneficial to NUSTL as it was preparing to host the first S&T Urban OpEx. The information provided during this training session ensured that the event was successfully planned and executed.



FSB Staff with NUSTL’s Alfred Crescenzi and Robert Stocco.

EXPORT CONTROLS TRAINING

The S&T Export Control Group came to NUSTL in March 2015 for a training session to ensure NUSTL is aware of and abiding by the protection required of DHS equities while working with international partners. The training session was led by Tina Carlile and supported by Julio Fernandez and Joseph Kowalski who explained the fundamentals of export controls and provided general awareness on issues to be concerned about and aware of, including e-mail communications containing advice or information that could be considered an “export” that may be accessed by foreign nationals.



Export Controls Manager Tina Carlile presenting to NUSTL.

SHEMS INTERNAL AUDITOR TRAINING

In June 2015, NUSTL’s Administrative Division Director, who also serves as the SHEMS Coordinator, Alfred Crescenzi, Facility Assistant Christian Madera and Management Analyst Kris Dooley attended a SHEMS internal training course taught by SME Joe Cascio and hosted by the DHS Transportation Security Laboratory. The training included an overview of SHEMS principles, applicable standards and auditing guidance. Additionally, hands-on exercises provided attendees with opportunities to test their comprehension of SHEMS audit techniques and their overall knowledge of SHEMS.



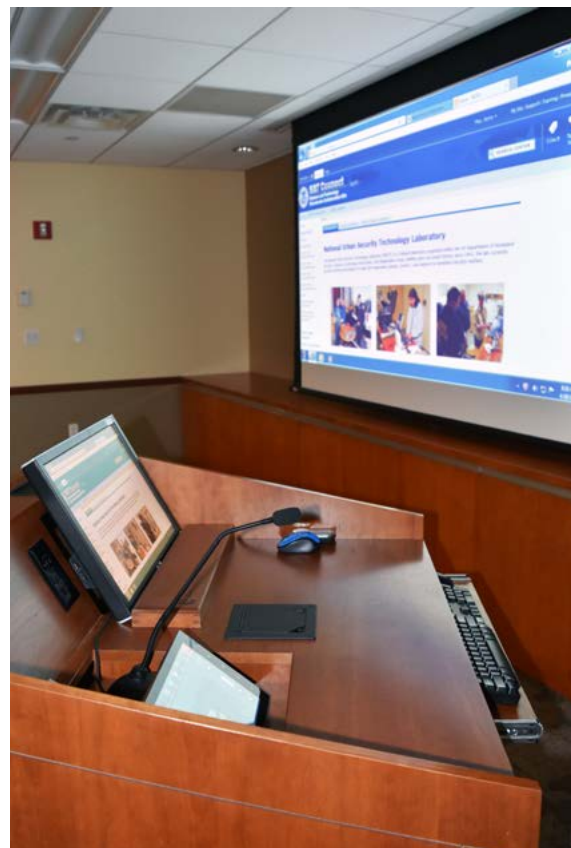
NUSTL SHEMS Coordinator Alfred Crescenzi, Facility Assistant Christian Madera and Management Analyst Kris Dooley attended the SHEMS internal auditor training along with TSL and Mabbett Associates staff members.



▼ INFORMATION TECHNOLOGY

In 2015, NUSTL upgraded various aspects of Information Technology equipment to ensure its facility remains state-of-the-art. Within the Grand Central Conference Room, NUSTL's largest, a recessed, in-ceiling, 109-inch, motorized projection screen and a ceiling-mounted, high-definitional digital projector were installed. The display screen and projector upgrade provides a maximized visual effect for meetings and conferences. A digital audio / visual system was also installed in the Grand Central Conference Room to improve the overall sound by reducing the acoustic interferences that exist with analog systems. This new system provides higher resolution and can be integrated with future technology upgrades.

Additionally, a new Homeland Secure Data Network Modem was installed in NUSTL's classified discussion (Limited Area) room. This modem allows for access to the Homeland Secure Data Network, which enables classified information to reach federal agencies involved in homeland security missions.



Grand Central Conference Room featuring an upgraded audio/visual system.



▼ SECURITY

In November 2015, NUSTL's Administrative Division Director Alfred Crescenzi, who also serves as the Security Manager, along with the GSA Varick Street Federal Office Building Senior Property Manager Juan Gonzalez, jointly presented a proposal to the Facility Security Committee (FSC) to eliminate the security vulnerability and risk of intruders entering the building while the NUSTL West Houston Street loading dock bay doors are opened. This proposal outlined their request to reduce the vulnerability by installing a security booth on the sidewalk to house an armed security officer.

The request was agreed upon by all tenant agency members of the FSC, which also agreed to fund the cost of the shack and security guards 24 hours a day, seven days a week. In early 2016, the security shack was installed and is now manned with an armed security guard.



Security shack installed on West Houston Street to mitigate security vulnerabilities when loading bay doors are open.

▼ LOOKING AHEAD

2016 looks to be another successful and impactful year for NUSTL as the laboratory seeks to increase its outreach and support to the national first responder community and S&T technical divisions.

The laboratory has already begun planning for its second annual Urban OpEx event in which first responders from across the nation will convene to participate and observe experimentations on emerging technologies in urban operational settings.

Additionally, NUSTL's RNRR Division will host pilot sessions on its RDD Detonation Response Planning Guidance with city first responders and planners including Philadelphia, Pennsylvania; Fort Collins, Colorado and New York, New York.

Internal to S&T, NUSTL will provide test and evaluation support during the live testing and demonstrations of first responder communications in an electronic threat environment at White Sands Missile Range in New Mexico. The laboratory will also serve as a test agent for the NGFR Apex Program, a five-year program aimed to help tomorrow's first responders be more protected, connected and fully aware.

These initiatives are only a few of the many in which NUSTL's dedicated and talented workforce plans to execute in 2016 to help our first responders secure our nation.

For more information on NUSTL's facility, programs, products and services please contact NUSTL@hq.dhs.gov.



DHS S&T Undersecretary Dr. Reginald Brothers, along with former FRG Acting Director (current RDP Director) Jay Martin and former USST Senior Staff Assistant (current Acting Chief of Staff) Kathryn Coulter, visited NUSTL. They were provided with a briefing on the laboratory's history, mission and programs.



