



Science and Technology Directorate

FY 2011 Year In Review



**Homeland
Security**

Science and Technology

“Our future depends on reaffirming America’s role as the world’s engine of scientific discovery and technological innovation.”

— *President Barack Obama*



Letter from the Under Secretary for Science and Technology

It is a pleasure to share the Department of Homeland Security (DHS) Science and Technology Directorate's (S&T's) Year in Review. Over the past year, an austere budget environment resulted in sharp cuts to federal spending. Responsibly managing these cuts was a challenge, but S&T continued to deliver new technological capabilities and knowledge products to the Homeland Security Enterprise (HSE) through its work with industry, government, and academia.



S&T's contributions to the Department are captured with the following value-added proposition:

- S&T provides the HSE with new technological capabilities and operational process enhancements.
- S&T provides innovative, systems-based solutions to complex homeland security problems.
- S&T has the technical depth and reach to discover, adapt, and leverage technology solutions developed by federal agencies and laboratories; state, local, and tribal governments; universities; and the private sector—across the United States and internationally.

Our ongoing review of the directorate's portfolio of Research and Development (R&D) projects ensured that our projects were high-impact, reflected our operational partners' highest priorities, and were not duplicative of existing efforts. S&T also maximized return on investment of R&D dollars by aggressively seeking out and building upon advanced technologies already under development in the public or private sector and by collaborating with other federal agencies, universities, businesses, and international partners.

Over the past year, we transitioned numerous technologies and knowledge products to the HSE. The diverse applications of these products reflect the breadth and complexity of DHS missions that S&T strives to serve. One new technology, the Controlled Impact Rescue Tool, enabled first responders to breach concrete more safely and 85 percent faster than is possible using existing methods. The DNSSEC protocol ensured that our cyber networks are protected against malicious web site redirections. In the field of explosives detection, our Digital Imaging and Communication in Security standard allowed software and hardware technologies to be freely integrated, spurring competition and development of more effective detection tools. S&T's CREATE Center of Excellence developed a software algorithm called Assistant for Randomized Monitoring Over Routes that enabled the U.S. Coast Guard to deploy its boats more effectively. The strong partnership between S&T and DHS components is reflected by the enduring success of S&T's Apex programs with the U.S. Secret Service (Apex STORE) and U.S. Customs and Border Patrol (Apex Secure Transit Corridors).

We also continued to work with the Under Secretary of Management to apply S&T's engineering expertise toward development of a more disciplined and efficient approach at the front end of the government acquisition cycle. In addition to issuing 10 new standards, S&T's Testing & Evaluation and Standards Division provided independent oversight and completed operational testing and evaluation for eight major acquisition programs in FY 2011.

In its first full year of operation, S&T's Research and Development Partnerships (RDP) certified the first SECURE product, an explosion-proof camera developed by the private sector. RDP also awarded dozens of internships and signed 31 new Cooperative Research and Development Awards with industry and universities in the United States and abroad. Secretary Napolitano signed two new S&T sharing agreements with the European Commission and Spain for a total of 12 existing international cooperative agreements that enable S&T to leverage additional resources and expertise. Last, in response to FY 2010 solicitations, RDP's Small Business Innovation Research Program was able to award \$7.6 million to small businesses from six states.

DHS's broad missions and the dynamic threat environment facing the HSE require a strong technical organization and the best solutions that science and engineering can produce. In spite of the numerous demands on its limited resources, S&T delivered great value to the HSE in FY 2011, as this document illustrates. These accomplishments result directly from the imagination, dedication, and hard work of the men and women of S&T and our partners in the HSE. I thank them for their service to S&T, to DHS, and to the country.

Tara O'Toole, M.D., MPH
Under Secretary for Science and Technology

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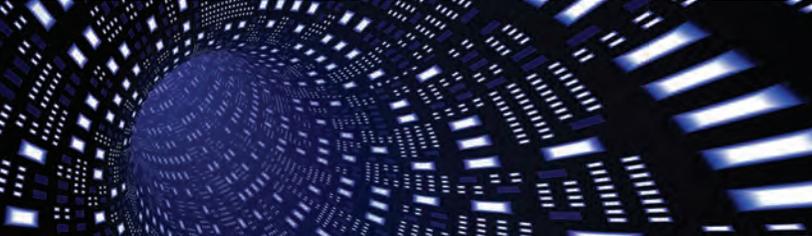
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I. About S&T

Achieving the Mission Despite
a Challenging Environment



Accomplishing the Mission Through Innovation

The mission of the Department of Homeland Security Science and Technology Directorate is to *strengthen America's security and resiliency by providing knowledge products and innovative technology solutions for the Homeland Security Enterprise.*

This mission is extraordinarily broad, yet the resources provided to accomplish it are extremely limited. Therefore, S&T must make careful judgments about where to invest and must ensure that these decisions reflect the strategic priorities of its stakeholders. Given the limited resources, S&T aims to rapidly transition new capabilities to the field; improve the operational effectiveness of DHS and the Homeland Security Enterprise (HSE) by gaining new efficiencies and acquiring new technologies; identify and meet top needs of first responder communities; encourage and leverage basic research related to the HSE; and build an ecosystem of innovation within S&T.

Innovation is essential to offering solutions to many of the challenges confronting the Department. It requires a deep, precise understanding of the problem to be solved,

and by building strong partnerships at the local, tribal, state, and federal level, we gain a deeper understanding of our stakeholders' needs, priorities, and operational environments. With a closeness to the field that is unique to S&T, we understand the problems faced, identify solutions, and get there through technical and knowledge-based innovation.

DHS and the HSE need technology to protect the nation, and S&T is positioned to help provide the innovation necessary to accomplish this mission. Technology foraging discovers, adapts, and leverages technology solutions developed by other governmental and private-sector entities to address risks to our security. S&T's disciplined and comprehensive approach to technology foraging requires a thorough review of technologies identified as having the potential to meet the HSE's needs.





II. FY 2011

Making the Most
of Limited Resources



S&T Realignment and Portfolio Review

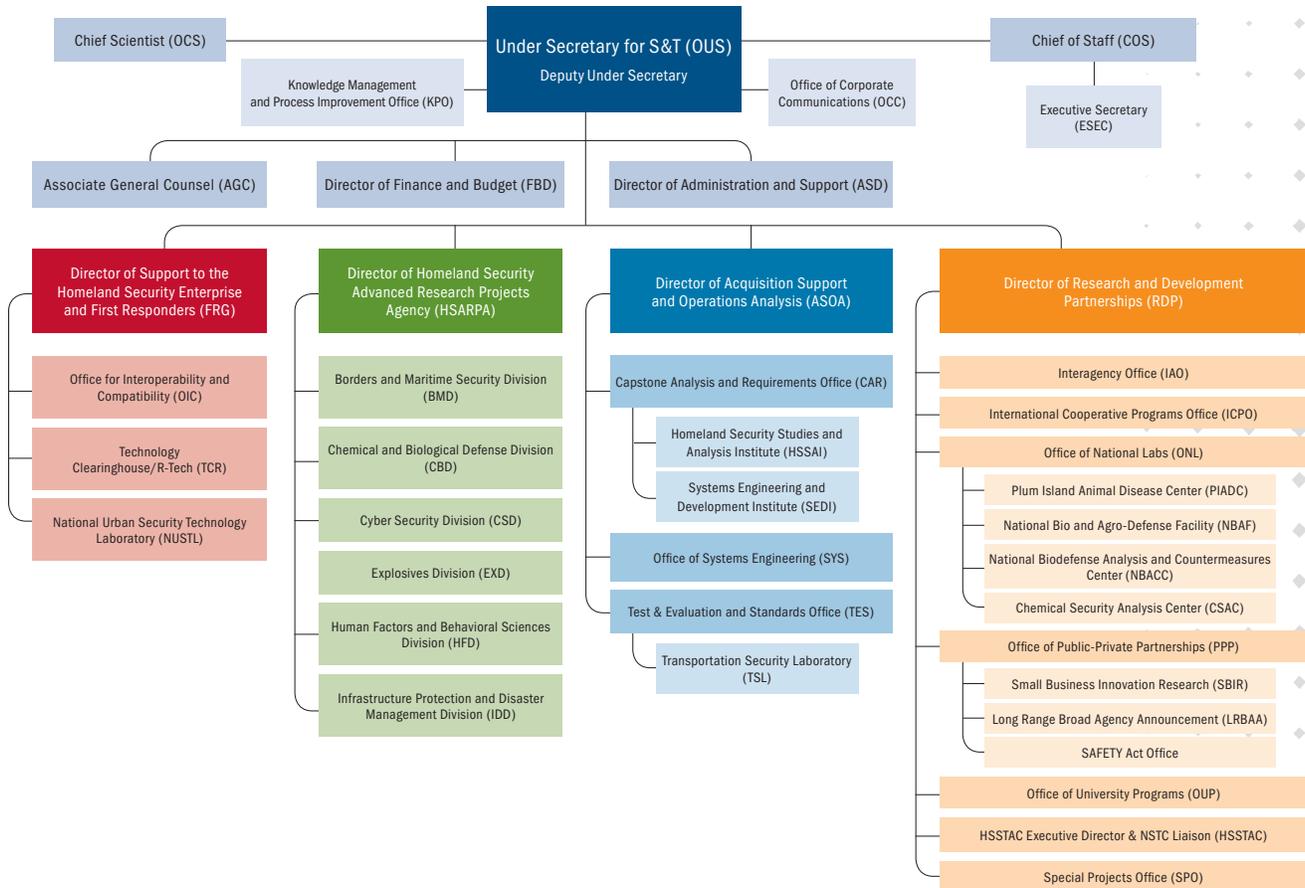
S&T operates in a dynamic environment where new threats and natural disasters suddenly emerge, political perspectives shift government priorities, and budgets continue to shrink. Given this context, the directorate recognized that it must be strategic in spending its limited resources. In late 2010, S&T was realigned to enhance its ability to strategically contribute to the DHS HSE mission, operations, and strategy. This realignment included an organizational realignment and a portfolio analysis.

S&T’s organizational realignment implemented the framework necessary to accomplish strategic goals by instituting four groups that work together to ensure each aspect of S&T’s work is given the appropriate amount of emphasis. This construct allows the efficient interaction among the four group leads and creates a dynamic that fosters

partnership and collaboration both within S&T and throughout the HSE.

S&T also implemented a rigorous process through which it reviewed and balanced its research and development portfolio, integrating planning, budgeting, and performance management into the assessment of all R&D initiatives. Findings showed clear evidence of significant improvement in the quality of the projects in S&T’s portfolio since 2010—a level of performance that put S&T in “benchmark” status compared to other R&D organizations in government and the private sector. Recognized by the Secretary, Deputy Secretary, OMB, and Congress for conducting the portfolio reviews and proactively managing its work and budget, S&T has an extremely strong collection of R&D projects to carry into FY 2012.

Current DHS S&T Organization



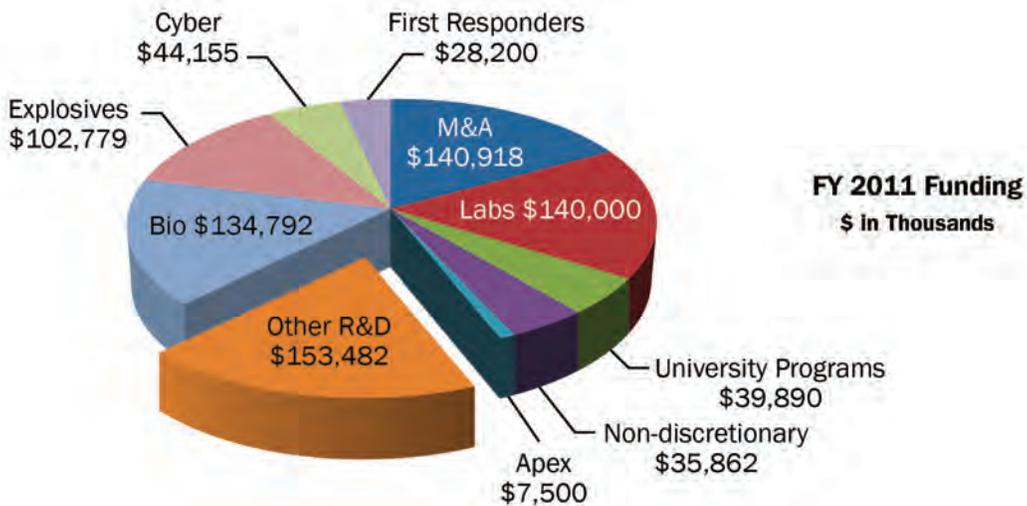
The Budget

From FY 2010 to FY 2011, S&T’s overall research, development, acquisition and operations budget dropped by 20 percent; in this same period, S&T’s discretionary Research and Development (R&D) budget dropped by 23 percent. These reductions forced S&T to reduce R&D projects from nearly 200 to about 140. They also meant that S&T’s focus would be limited to four priority areas: biothreat security; cybersecurity; explosives (aviation security); and first responders. Even these areas were not exempt from reductions.

Compared to FY 2010:

- Explosives funding went down by 23 percent, eliminating most basic research.
- Biological research funding went down by 14 percent, reducing R&D in biothreat assessment and bio-attack resiliency.
- First responder R&D funding went down by 23 percent, reducing information sharing and interoperability projects.

Support for borders and maritime security R&D dropped by 23 percent.



“The United States has always excelled in our ability to turn science and technology into engineering and products, and we must continue to do so in the future.”

— 2011 National Security Strategy, The White House

Partnerships

S&T has a statutory responsibility to transfer useful technologies and information to first responder communities, state and local governments, and the private sector. Yet this year, S&T made the most of its limited resources by forging multidisciplinary partnerships across all of these groups not just to transfer solutions, but to create them. Private companies, federal agencies, universities, and international entities worked with S&T to solve the most critical of homeland security challenges.

S&T's four types of partnerships:

Private Sector Partnerships

Partnering with the private sector was one of S&T's highest priorities. Small business is an important engine of innovation and job creation, and therefore S&T uses a variety of ways to engage the private sector. S&T's Small Business Innovation Research program actively works to develop technology solutions to homeland security issues that are innovative and accelerate transitions into the marketplace. Better integration and promotion of research efforts with the private sector resulted in companies investing their own internal research and development funds to bring S&T-developed technologies to the market.

Collaboration With Other Federal Agencies

S&T's collaborations with other agencies at both the policy and programmatic level enable it to reach beyond the resources of DHS alone in order to better provide capabilities that strengthen homeland security efforts. This coordination enabled S&T to examine the full range of homeland security issues and form and maintain relationships with other science and technology organizations that could be translated into collaborative programs that maximize and leverage available expertise and resources.

University Partnerships

Leveraging the investment and expertise of academia was a key part of S&T's strategy to meet the needs of the Department. S&T supported nine university-based Centers of Excellence (COEs). Working together as a consortium of colleges, universities, and private sector partners, the centers pursue a mixed portfolio of basic and applied research addressing both short- and long-term homeland security needs. The COEs have been successful because they've built a

reputation for delivering high-impact work with direct, practical application.

International Collaborations

S&T has bilateral agreements with 12 international partners. These partnerships enable DHS and other agencies in the HSE to leverage funds, manpower, and facilities in support of the mission. This year, S&T had 134 active bilateral projects, including \$15 million in contributions from international partners.

S&T demonstrated the power of intensive collaboration through its Apex projects, which devised processes to make partnerships a cornerstone of work, whether with HSE partners or in collaboration with partner R&D organizations. Apex projects enabled S&T to invent and implement solutions to large, complex, high-priority problems—all through partnership and collaboration.





III. S&T Accomplishments

Support to the
Homeland Security Enterprise
and First Responders (FRG)



Support to the Homeland Security Enterprise and First Responders

The U.S. Department of Homeland Security (DHS) Science and Technology Directorate's (S&T's) Support to the Homeland Security Enterprise and First Responders (FRG) Group strengthens the response community's abilities to protect the homeland and respond to disasters. Through the engagement of, and partnership with first responders and the emergency preparedness and response community at every stage and at the local, state, tribal, and federal level, FRG pursues a better understanding of the response community's needs and requirements, provides technical assistance, and develops innovative solutions to the most pressing challenges faced during day-to-day and large-scale emergencies.

Three FRG divisions work together to carry out this mission: the Office for Interoperability and Compatibility, First Responder Technologies (R-Tech), and the National Urban Security Technology Laboratory (NUSTL).

Mission

In close partnership with first responders at all levels, FRG identifies, validates, and facilitates the fulfillment of needs through the use of existing and emerging technologies, knowledge products, and standards. Prioritized areas of FRG focus and initiatives include:

Making First Responders Safer. To safely and effectively respond in dangerous environments, first responders need access to the best technology and equipment available. FRG works with first responders to identify capability gaps, define requirements, and partner with industry to develop improved preparedness and response tools, such as personal alert and tracking systems; improved police, fire, and emergency medical services equipment; and enhanced safety standards for equipment and vehicles.

Helping First Responders Share Data and Critical Information. Technology, process, and governance barriers often obstruct the ability of first responders across jurisdictions and disciplines to share the critical information necessary to better make decisions during emergencies. FRG is developing a suite of information-sharing tools to assist in reducing these barriers, thus enabling states and localities to safely and openly share geospatial information.

Helping First Responders Communicate Through Interoperability. To respond to day-to-day incidents and large-scale emergencies, it is critical that first responders access and seamlessly exchange information via voice, data, and video. FRG continues to work with first responders to improve interoperability through the development of technologies that can communicate across multiple radio bands; to identify requirements for public-safety data and video use; and to develop processes to ensure that communications equipment is interoperable regardless of manufacturer.

Engaging, Communicating, and Partnering With First Responders. FRG links S&T to first responders and the overall emergency preparedness and response community through effective communications, outreach, and stakeholder engagement. FRG engages first responders to understand their needs and requirements and connects with partners to better serve them.

Over the next several pages, a few projects have been highlighted from each FRG division. A complete list of FRG's FY 2011 projects can be found on page 19.

Office for Interoperability and Compatibility

Multi-Band Radio

The Homeland Security Enterprise and First Responders (FRG) Group partnered with first responders and industry on the Multi-Band Radio (MBR) initiative to identify capability gaps, determine requirements, and challenge manufacturers to develop a single, portable radio capable of operating across the disparate radio bands used by first responders. The MBR allows first responders to communicate with partner agencies—regardless of the radio band on which they operate. At a cost comparable to one high-end portable radio, the MBR provides responders with the cutting-edge communication capabilities necessary to respond to emergencies.

In FY 2011:

- S&T conducted additional test demonstrations and evaluations of prototypes at events nationwide, including the Fourth of July festivities in Southern Florida, the Chicago Marathon and Magnificent Mile Lights Festival, the Phoenix International Raceway NASCAR Sprint Cup races, and the New Orleans Jazz and Heritage Festival.
- A final demonstration during Super Bowl XLVI highlighted the usefulness of this technology.
- A detailed procurement guide for first responders is scheduled to be released in 2012.
- The MBR initiative sparked industry investment and stimulated the MBR marketplace. This stimulus will lead to the development of more feature options and a more competitive price point for response agencies. Now commercially available, MBR equipment is currently being developed and marketed by three manufacturers, with more on the horizon.



“During the Discovery Building shooting, we were able to pre-load the federal channels for use with our many federal responders. It was then we recognized the strategic abilities that the MBR offered us that the 1200+ other devices did not.”

— *Communications Specialist at FEMA USAR,
Master Firefighter at Montgomery County Fire & Rescue John Freeburger*

Office for Interoperability and Compatibility

VIRTUAL USA Virtual USA® and Next-Generation Incident Command System

Virtual USA®

Virtual USA® (vUSA), a collaborative effort among S&T, other DHS entities, and state and local emergency management agencies, improves information sharing between emergency management agencies and their partners at all levels. This ability to share information strengthens their understanding of a situation, allowing better decisions to be made that are based on more complete information. vUSA allows participating agencies using the vUSA library to make their data available to others as web links and pull others' links to display in their own map viewers. The success of vUSA rests not only on improving technical capabilities, but on encouraging trusted relationships among the community at all levels.

Next-Generation Incident Command System)

While vUSA focuses on information sharing at all levels of government, the focus of the Next-Generation Incident Command System (NICS) is on first responders in the field. NICS provides real-time collaboration for field personnel with limited connectivity but with the need for real-time collaboration. S&T is integrating vUSA and NICS to leverage shared services, promote interoperability, and realize cost savings through IT consolidation. S&T is also in the process of aligning this technology suite with the national and DHS information-sharing and safeguarding strategies.

vUSA and NICS in FY 2011:

- S&T supported the Central U.S. Earthquake Consortium states' participation in the National Level Exercise 2011, allowing participating jurisdictions to view other jurisdictions' real-time critical data.
- S&T released the vUSA Generation IV (Gen IV) prototype, making vUSA useful not only for coordinating response to major emergencies, but also for coordinating during local, special events. Gen IV offers increased flexibility, allowing users to differentiate by county, city, agency, or department, even down to the individual user level.
- S&T developed the National Information Sharing Agreement, to which 28 federal and state agencies have signed, thereby agreeing to share data with each other.
- In response to the Deepwater Horizon Oil Spill in 2010 and 2011, the Florida Civil Air Patrol was able to share real-time information on oil sightings with the Florida Emergency Operations Center and the Unified Command in Mobile, Ala.—enabling both states to deploy response teams to specific locations, saving time and money, and maximizing the effectiveness of the cleanup effort. Similarly, in Louisiana, information gathered during flights over the Gulf Coast and shared with partners through vUSA allowed agencies to better target operational response and cleanup teams.
- vUSA was also used in the 2011 Mississippi River flooding response, where Missouri, having learned techniques from Tennessee through participation in the National Level Exercise 2011, used vUSA to share information related to levee water levels, Civil Air Patrol flood photos, road closures, and hospital status with adjacent jurisdictions.
- NICS was used in support of the 2011 Los Angeles Marathon to improve situational awareness and deploy medical personnel for hypothermic at-risk runners and wheelchair participants.
- NICS also supported the 2011 firefighting season in San Diego County during the wildland fires on the Pala and Los Coyotes Reservations. Both the California Department of Forestry and Fire Protection (CAL FIRE) and the Sycuan Band of the Kumeyaay Nation used NICS for situational awareness to preserve life and property.

First Responder Technologies

First Responder Support Tool -Bomb Response

First Responder Support Tool (FIRST)-Bomb Response takes advantage of the ubiquity of smartphones, the familiarity people have in using their phones' inherent capabilities, and the ease of sharing information over a network to provide a simple, yet powerful bomb-response tool. This application is available for the iPhone/iPad platforms, Android devices, and Windows PCs. FIRST-Bomb Response works with the commercial application HAZMAT Evac to provide first responder capabilities that seamlessly address evacuation responses for improvised explosives devices and HAZMAT spills. FIRST-Bomb Response provides the first response community with a dramatic increase in overall response and recovery capability, using current technologies while not requiring any additional training.

In FY 2011:

- FIRST-Bomb Response was demonstrated at the Technologies for Critical Incident Preparedness Conference and Exposition.
- Field evaluations were conducted. The National Bomb Squad Commanders Advisory Board and the DHS Office of Bombing Prevention (OBP) provided the support during the development. The Washington Metropolitan Area Transit Authority Bomb Squad/police office, EMT units, and firefighter/HAZMAT units participated during the operational evaluation; U.S. Secret Service personnel observed the evaluations.
- The application became finalized and available for download from "app" stores.

Next-Generation Self-Contained Breathing Apparatus

A Self-Contained Breathing Apparatus (SCBA) is a device worn by responders that provides breathable air when one is working in hazardous conditions. Current SCBAs are heavy and have a large diameter, adding extra physical stress and limiting the movement of firefighters during emergency response operations. In partnership with the International Association of Fire Fighters, Vulcore Industrial, and Mine Safety Appliance, S&T completed development of a new SCBA pressure vessel technology, creating a pack that is thinner and more flexible than any on the market today. S&T's new technology uses eight small plastic air containers wrapped and braided with carbon and Kevlar® fibers. Slimmer and lighter, the new technology allows emergency responders to experience less stress, move more easily in confined spaces, and operate more safely in hazardous response environments.

In FY 2011:

- The new pressure vessel technology was operationally assessed by the Chicago Fire Department.
- S&T's new pressure vessel technology, which can be used in SCBAs provided by any manufacturer, was certified by the Department of Transportation and the National Fire Protection Association.
- Most SCBA manufacturers have produced and displayed a concept prototype that utilizes the new pressure vessel technology.
- The Department of Defense (DoD) is working diligently with Avon and Vulcore Industrial to produce a low-profile pressure vessel technology for the military.
- Avon has expressed interest in being the first SCBA manufacturer to market with the new pressure vessel technology.

First Responder Technologies

Board Armour™ Backboard Cover

Even when cared for with standard cleaning techniques and storage methods, some emergency-medical backboards are contaminated with bacteria that can make patients and rescuers sick. S&T, in partnership with the Center for Commercialization and Advanced Technology and Advanced EMS Designs, developed a backboard cover that provides a critical barrier between the patient and the potentially contaminated board. The Board Armour™ backboard cover protects both the patient and the responder, preventing the spread of disease. With an optional, integrated, disposable, cervical immobilization device (CID), and optional disposable CID straps, the cover prevents backboard-to-patient contamination, reduces cleaning time, and provides head stabilization. Different versions to accommodate different backboards and different use scenarios are available commercially.

In FY 2011:

- The backboard cover was suggested by first responders, developed in partnership with industry, and made commercially available in less than eight months.
- The backboard cover was operationally assessed by the Prince George's County Fire Department in Maryland.
- Advanced EMS Designs is actively negotiating the potential sale of backboard covers to EMS departments around the country.



National Urban Security Technology Laboratory

Securing the Cities

Managed by the Domestic Nuclear Detection Office and supported by National Urban Security Technology Laboratory (NUSTL), Securing the Cities (STC) is a cooperative local, state, and federal program, initially piloted in the New York City metro area. The program seeks to design and implement architecture for coordinated and integrated detection, and interdiction of illicit radiological materials that may be used as a weapon within the region. To date, NUSTL has received and acceptance-tested thousands of hand-held, mobile, vehicle-mounted, and ship-mounted radiation detectors prior to their being put into service by the response community.

In addition, NUSTL uniquely supports local responder agencies' training and exercise events by providing Nuclear Regulatory Commission -licensed radioactive materials, a specialized training cache of material, and equipment tailored to support DHS-approved courses.

In FY 2011:

- NUSTL supported training of 873 students in 24 Preventive Radiological and Nuclear Detection classes.
- Local and state partners relied on NUSTL to advise and assist on implementing the capability to own, store, and handle licensed radioactive materials, adding to the overall goal of STC for self-sufficiency among the partners.
- At the request of the New York Police Department (NYPD) and STC regional partners, NUSTL was selected as the preferred service provider for testing new equipment and a Memorandum of Understanding was enacted to formalize the partnership.
- NUSTL tested nearly 1,000 personal radiation detectors and dozens of radioisotope-identifying detectors.



National Urban Security Technology Laboratory

Radiological Emergency Management System

Developed by NUSTL, Radiological Emergency Management System (REMS) is a post-event, fixed-site radiation detection network designed to give critical knowledge of city-wide radiation levels to emergency management officials even before responders enter an attacked area. When fully deployed, REMS will provide a single picture of the threat at the time of weakest coordination—that is, in the moments immediately following the incident—allowing city commanders to deploy resources in the most efficient manner and to make informed decisions to help reduce radiation exposure to emergency responders and to the public. Access to timely, accurate data will also allow officials to manage concern among the city's residents and workforce, avoid unnecessary evacuations, and reduce the economic impact of an event upon the city. Used in conjunction with meteorological data and plume modeling software, REMS may be able to predict the path of radioactive plumes and give early warnings to affected areas.

In FY 2011:

- An initial set of REMS devices was installed at various Manhattan NYPD facilities and site prep work was completed for additional devices that will be installed in 2012.
- NUSTL provided ongoing support to NYPD in the areas of REMS installation, alarm resolution, and site selection through plume modeling.
- NUSTL is developing a REMS detector calibration plan to assist NYPD with ongoing device maintenance.

The successful implementation of REMS in New York City (NYC) will provide a model for other cities because there are many advantages to having a system for response and recovery in place prior to an event. Reports available to the national first responder community will capture lessons learned in NYC and facilitate this transfer.

New York Area Science & Technology Workgroup

Managed and hosted by NUSTL, the New York Area Science & Technology (NYAST) workgroup is a consortium of local, state, and federal government organizations and private-sector groups that regularly meet and interact to promote and discuss advances in science and technology applications. The quarterly NYAST topical meetings provide an opportunity for the diverse first responder members to interact and develop contacts across the homeland security community. In addition, the NYAST forum provides a unique opportunity to gather valuable feedback from field operators and to draw out operators' most pressing issues and needs in homeland security.

In FY 2011:

- NUSTL hosted three NYAST events that featured speakers and technology from Federal Emergency Management Agency (FEMA), S&T, Transportation Security Administration (TSA), the Oak Ridge Institute for Science and Technology, and the Mississippi Emergency Management Agency.
- Average NYAST participation increased from 33 people per event in 2010 to 53 people.
- There was no cost to S&T to coordinate this quarterly meeting.
- The forums connected S&T program managers to operational end-user organizations, which enabled interactions and partnerships that might not have developed otherwise.
- Meetings became available via webcast, expanding the reach of NYAST meetings beyond the New York City area.

FRG Communications, Outreach, and Responder Engagement

FirstResponder.gov

FirstResponder.gov was created by S&T to be a one-stop portal to DHS funding, standards, and other resources. The site affords the opportunity for the response community to link to many different sites, including the First Responder Communities of Practice, the Responder Knowledge Base, the First Responders Group Bulletin, and vUSA.

In FY 2011:

- More than 60 articles and blog posts were published on the site.
- The site featured “Technology Profiles” on more than 35 S&T projects.

First Responder Communities of Practice

First Responder Communities of Practice, located at <https://CommunitiesFirstResponder.gov>, is a professional networking, collaboration, and communications platform for active and retired first responders, emergency response professionals, government employees, and others working in homeland security and preparedness. Created by S&T, this community focuses on emergency preparedness, response, recovery, and other homeland security topics and issues.

In FY 2011:

- Sixty-seven new communities were added, for which program staff provided support to assist in membership growth and engagement.
- Program staff presented First Responder Communities of Practice as a model to enhance collaboration at several national conferences, including the Texas Homeland Security Annual Conference, the Urban Area Security Initiative (UASI), and the annual conference of the International Association of Emergency Managers (IAEM).
- Site membership more than doubled, from 1,721 members to 3,676.
- Program staff developed and presented collaboration strategies for various entities, including DHS (Citizen Corps, FEMA), first responder organizations (IAEM, UASI, All-Hazards Incident Management Team), private-sector entities (National Center for Spectator Sports Safety and Security), and academic institutions.

First Responder Resource Group

S&T’s First Responder Resource Group (FRRG) serves as a mechanism for continual dialogue and the coordination of research, development, and delivery of technology solutions to first responders and the emergency preparedness and response community at the local, tribal, state, territorial, and federal levels. As part of the FRRG, more than 120 responders from around the country are engaged throughout S&T’s established solution development process to identify, validate, and facilitate the fulfillment of first responder needs through the use of existing and emerging technologies, knowledge products, and standards.

In FY 2011:

- S&T created the FRRG to improve S&T’s ability to maximize resources and collaboration with stakeholders.
- The inaugural session of the FRRG convened in National Harbor, Maryland.
- The FRRG identified and prioritized its top nine capability gaps for S&T to be used to inform funding decisions and project development.

FRG Group Projects at a Glance

- 1401 Technology Transfer Program
- Alerts and Warnings Using Social Media (AWSM)
- Ambulance Patient Compartment Design Standards
- Board Armour™ Backboard Cover
- Chem Detector-ChemTag™
- Chemical – Biological Research
- Collaboration Lab
- Comparative Analysis of Forensic Video Specification (CAVS)
- Emergency Data Exchange Language (EDXL)
- Ergonomic Mask
- FirstResponder.gov
- First Responder Communities of Practice
- First Responder Resource Group (FRRG)
- First Responder Support Tool (FIRST)-Bomb Response
- LIFT “HomeTech” Program
- Mobile Biometrics
- Multi-Band Radio
- New York Area Science & Technology (NYAST)
- Next-Generation Incident Command System (NICS)
- Next-Generation Self Contained Breathing Apparatus (SCBA)
- Noise Cancellation for Voice Operated Switch (VOX) Devices
- Personal Alert and Tracking System (PATS)
- Project 25 Compliance Assessment Program (P25 CAP)
- Project Responder 3
- Radiological Emergency Management System (REMS)
- Rapid Anthrax Detection
- Regional Common Operating Picture (RCOP)
- Securing the Cities (STC)
- Semi Autonomous Pipe Bomb End Cap Remover (SAPBER)
- Standoff Patient Triage Tool (SPTT)
- Symbology for First Responders
- Technical Assistance-Pilots
- Video Quality in Public Safety (VQiPS)
- Virtual Social Media Working Group (VSMWG)
- Virtual Training
- Virtual USA® (vUSA)
- Voice Over Internet Protocol (VoIP)
- WildCAT
- Wildland Firefighters Advanced Personal Protection System
- Wireless Broadband Technology Demonstrator

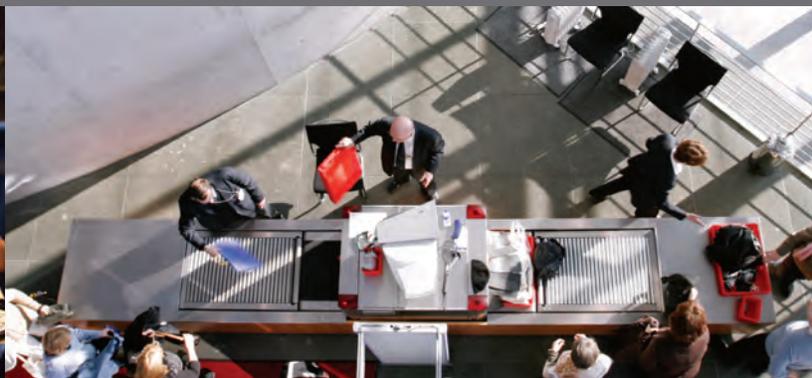
“DHS is focused on getting resources and information out of Washington, D.C. and into the hands of state and local law enforcement, in order to provide them with the tools they need to combat the threats communities face.”

— *DHS Secretary Janet Napolitano*



III. S&T Accomplishments

Homeland Security
Advanced Research Projects
Agency (HSARPA)



Homeland Security Advanced Research Projects Agency

Mission

In close partnership with DHS operating components, Homeland Security Advanced Research Projects Agency (HSARPA) divisions focus on identifying, developing, and transitioning technologies and capabilities to counter chemical, biological, explosive, and cyber terrorist threats, as well as protecting our nation's borders and infrastructure.

Select areas of HSARPA focus and their initiatives include:

Saving lives and protecting the nation's infrastructure against chemical, biological, and agricultural threats and disasters. HSARPA provides a comprehensive understanding and analyses of chemical and biological threats, and develops pre-event assessment, discovery, and interdiction capabilities as well as capabilities for warning, notification, and timely analysis of incidents. The division optimizes recovery technology and processes, enhances the capability to inform attribution of attacks, and develops medical countermeasures against foreign animal diseases.

Protecting users, infrastructure, and the Internet by securing cyber systems and networks, making them resilient to cyber threats. HSARPA ensures that infrastructure and the Internet are secure and less vulnerable to malicious and natural events. It focuses R&D activities on critical characteristics essential to trustworthy cyber systems and provides safe cyber arenas to enable research on discovery, testing, and analysis of tools, technologies, and software. Additionally, HSARPA assesses, evaluates, experiments, and pilots emerging cyber products. R&D activities for users are provided to attract next-generation cybersecurity warriors and provide improved tools for conducting cyber, criminal, and terrorist investigations.

Developing technical capabilities to detect, respond to, defeat, and mitigate non-nuclear explosives terrorism. HSARPA develops technologies to secure aviation, passenger, and cargo safety at airports and checkpoints, as well as protect people and facilities in high-volume, fast-paced environments, such as mass transit hubs and conveyances. It works to protect national infrastructure and treasures from explosive threats, utilizing multiple capabilities, including canines, imagers, trace detectors, and video surveillance, and supports Transportation Security Administration (TSA), U.S. Secret Service, first responders, and U.S. Customs and Border Protection (CBP).

Over the next several pages, a few projects have been highlighted from each HSARPA division. A complete listing of HSARPA's FY 2011 projects can be found on page 33.

“The Science and Technology Directorate is critical in our fight against the ongoing terrorist threat.”

— *House Committee on Homeland Security, Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies*
Rep. Daniel Lungren (R-CA)

Borders and Maritime Security Division

Detecting and Tracking Small Dark Vessels



Under the Small Dark Vessel project, S&T is developing ways to find and track small, unlit smuggling vessels, including submersibles and semisubmersibles, that are suspected of trafficking drugs and other contraband into the United States. Borders and Maritime Security Division (BMD) works with DHS operating components, other agencies, and community partners to understand the threat and find or create technological countermeasures. To quickly survey large geographical areas of unlit water, S&T helped develop a software application, the Tipsheet Review And Correlation EnhanceR, or TRACER. With TRACER, an operator can quickly “see” and characterize a small, unlit watercraft, determine its bearing and speed, and alert law enforcement.

In FY 2011:

- A joint demonstration with CBP was held to show the utility of the TRACER tool. Planning meetings were held to integrate the tool with other exploitation techniques in a large-scale demonstration in FY 2012.
- A successful demonstration of TRACER’s ability to improve ship detection algorithms led to its current utilization by Joint Interagency Task Force-South, the U.S. Coast Guard (USCG) Maritime Intelligence Fusion Center – Pacific, and U.S. Pacific Command.

Buried Border Tripwire

Borders and Maritime Security Division is developing a buried tripwire to detect and classify targets of interest crossing the border. Reliable algorithms are being developed to enable classification of low-flying aircraft, road vehicles, all-terrain vehicles, animal activity, and people without the use of imagers. These targets must be identified to be able to alert agents to the type of activity and to prevent them from responding to false alarms (such as animal activity).

In FY 2011:

- Structured testing was completed on the southern border tripwire site. Results were analyzed and the algorithms will be updated prior to a second field test in 2012.
- Favorable test results to date have led CBP to request that the buried tripwire output be routed to the Tucson Sector Dispatch for operational assessment and use. A system Certification and Accreditation is being performed to enable this connectivity.

Detecting and Tracking Small Dark Aircraft

The Small Dark Aircraft project is focused on developing capabilities to find small aircraft that are suspected of carrying illicit goods into the United States. In partnership with the CBP Office of Technology, Innovation and Acquisition, BMD is leading a cross-discipline, multiagency team to assess current U.S. counter capabilities and develop new technical means/options to characterize small aircraft of interest, detect, track, and interdict these aircraft and/or the goods carried by them.

In FY 2011:

- Borders and Maritime Security Division conducted a joint exercise with CBP to evaluate CBP’s capability to detect small aircraft, including several complex tests at an Air Force test range in California. Results showed how CBP could enhance its detection ability by modifying certain operational tactics and procedures.

Chemical and Biological Defense Division

“Detect-to-Protect” Bio-Aerosol Detection Systems

The objective of the “Detect-to-Protect” Bio-Aerosol Detection Systems (D2P) program is to develop and integrate biological threat sensors that can be placed in large critical infrastructure locations throughout the nation, such as airports, buildings, and subways. The sensors, which identify and confirm biological agents within minutes, will be deployed in a multitiered network to minimize operating costs and maximize confidence in alerts. Following sensor development, the D2P project will demonstrate a D2P system in a real-world scenario in the Boston subway system. The projects represent significant steps forward in the nation’s ability to prepare for, respond to, and recover from a domestic biological attack.

In FY 2011:

- S&T’s D2P project developed sensors, in partnership with numerous private sector groups.
- Massachusetts Institute of Technology Lincoln Labs designed and installed a sensor network in three adjacent Boston subway stations. Boston public health authorities and city officials approved bioterror simulant release testing, planned for 2012. The testing will validate and showcase the protective capabilities of the sensor network.

Foot-and-Mouth Disease Vaccines & Diagnostics

Chemical and Biological Defense Division (CBD) is working with the Plum Island Animal Disease Center (PIADC) to enhance current capabilities and develop state-of-the-art countermeasures (vaccines and diagnostic assays) for the highest-priority foreign animal diseases (FADs), including foot-and-mouth disease (FMD). This initiative focuses on developing next-generation licensable vaccines for FADs that can be produced in the United States, and deploying diagnostic assays to the National Animal Health Laboratory Network.

In FY 2011:

- CBD and PIADC signed a cooperative agreement with an industry partner for further development and commercialization of an FMD vaccine candidate.
- A company funded by CBD received a permit from the U.S. Department of Agriculture for the import of an FMD vaccine produced in Argentina in the event of an outbreak.
- CBD and PIADC continued to seek out and invest in new and novel vaccine technologies that have shown promise against FMD and other FADs.



Autonomous Rapid Facility Chemical Agent Monitor

The Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM) “detect-to-warn” chemical vapor detectors provide increased protection for critical infrastructure and their occupants against a chemical attack. Detectors include continuous monitoring, the ability to detect and identify up to 17 chemical warfare agents, and high-priority toxic industrial chemicals at concentration levels low enough to provide sufficient time to implement evacuation and response procedures.

In FY 2011:

- ARFCAM prototype detectors were delivered to the Nevada Nuclear Security Site for testing.
- Final detector configurations were transferred to the Argonne National Laboratory for transition into testbed pilots in New York City and Washington, D.C.
- The ARFCAM detector was commercialized as the RAID-AFM (Advanced Facility Monitor) for chemical detection.

Cyber Security Division

Domain Name System Security Extensions

Cyber Security Division's (CSD) Domain Name System Security Extensions (DNSSEC) effort, part of the division's Secure Protocols project, is working with various agencies and communities, including international organizations, to develop, test, evaluate, deploy, and transition DNSSEC technology to the operational Internet to secure the protocols for the cyber components of the Internet, specifically its Domain Name System.

In FY 2011:

- The “.mil” top-level domain was partially signed and .com was fully signed, joining the other top-level domains now signed, including “.gov,” “.uk,” “.org.”
- The DNSSEC effort earned CSD a National Cybersecurity Innovation Award at the SANS Institute's Second Annual National Cybersecurity Innovation Conference.

Cyber Security: Forensics Support for Law Enforcement

CSD's Cyber Security Forensics project is developing analysis devices designed for law enforcement to use in the daily investigation of criminal and terrorist activity. These tools will allow investigators to visualize, analyze, share, and present data derived from cell phones, GPS devices, computer hard drives, networks, tablets, and other digital media. The Cyber Forensics project has focused on several areas of mobile device forensics, including developing the capability to quickly pull evidence from disposable phones, reconstruct evidence from damaged phones, and investigate NAND and NOR flash memory resident on mobile devices.



In FY 2011:

- The first prototype of the First Responder Cyber Field Kit, a computer triage tool designed for non-technical law enforcement officers, was released by ADF Solutions, under contract to S&T. In addition to the requested features, the deployment focused on two aspects of the tool: creating a portable package for easy field deployment, and integrating interactive tutorials for users to learn how to properly use the tool on their own time.
- CSD funding to the National Institute of Standards and Technology contributed to the publication of four quarterly releases of the National Software Reference Library, which grew by 10 million records.

Cyber Security Division

Linking the Oil and Gas Industry to Improve Cybersecurity

Cyber Security Division's (CSD) Linking the Oil and Gas Industry to Improve Cybersecurity (LOGIIC) effort, part of the division's Process Control Systems Security project, assists in identifying oil and gas industry-wide vulnerabilities and develops solutions to help secure critical infrastructure. The LOGIIC consortium, an ongoing collaboration between oil and gas companies and S&T, provides a unified voice to the industry in collaboration with government, researchers, and vendors in order to protect their products and the nation's infrastructure from imminent threats. LOGIIC provides a template for how the government and private industry can successfully work together.

In FY 2011:

- The LOGIIC consortium completed two projects: an advanced comprehensive monitoring system for process control systems and a best-practices report to better secure safety instrumented systems.



Explosives Division

Canine Program

Explosives Division (EXD) Canine Program is working to provide customers the tools, techniques, and knowledge to better understand, train, and use the explosives detection canine. The program will deliver low-cost, nonhazardous aids for training canines to recognize homemade explosives (HMEs), evaluate conventional explosives training aids, and provide operational assessments of canines screening air cargo. It will test the ability of an ozone generator to be used as a masking agent and develop a database of current behavior metrics for the TSA's puppies and dogs.

In FY 2011:

- EXD provided TSA with low-cost, nonhazardous canine training aids for evaluation by the TSA National Explosives Detection Canine Team Program.
- EXD provided initial detection results and recommendations for canine operations when conducting air cargo screening, third-party cargo screening, and person search.
- EXD completed a database of current behavior metrics for TSA puppies and dogs.

Checked-Baggage Program

EXD is developing automated, high-speed, high-performance checked-baggage explosives detection systems with reduced false alarm rates, improved throughput, and reduced operations and maintenance costs. To accomplish this, the program will develop a certification-ready Explosives Detection System (EDS) for TSA's near-term acquisition and performance requirements, standards, and enabling technology for a next-generation EDS and spiral upgrades.

In FY 2011:

- EXD transitioned next-generation EDS performance requirements to TSA. The commercial development of next-generation systems will substantially improve the performance and affordability of checked baggage screening.
- EXD delivered version 1 of the Digital Imaging and Communication in Security (DICOS) industry standard for checked baggage and carry-on luggage screening. DICOS enables security screening components and systems to have standard interfaces for images and data.

“S&T’s efforts are greatly appreciated and we look forward to many years of continued partnership with the Department of Homeland Security, Science and Technology Directorate.”

— *Los Angeles Police Department Chief of Police Charlie Beck*

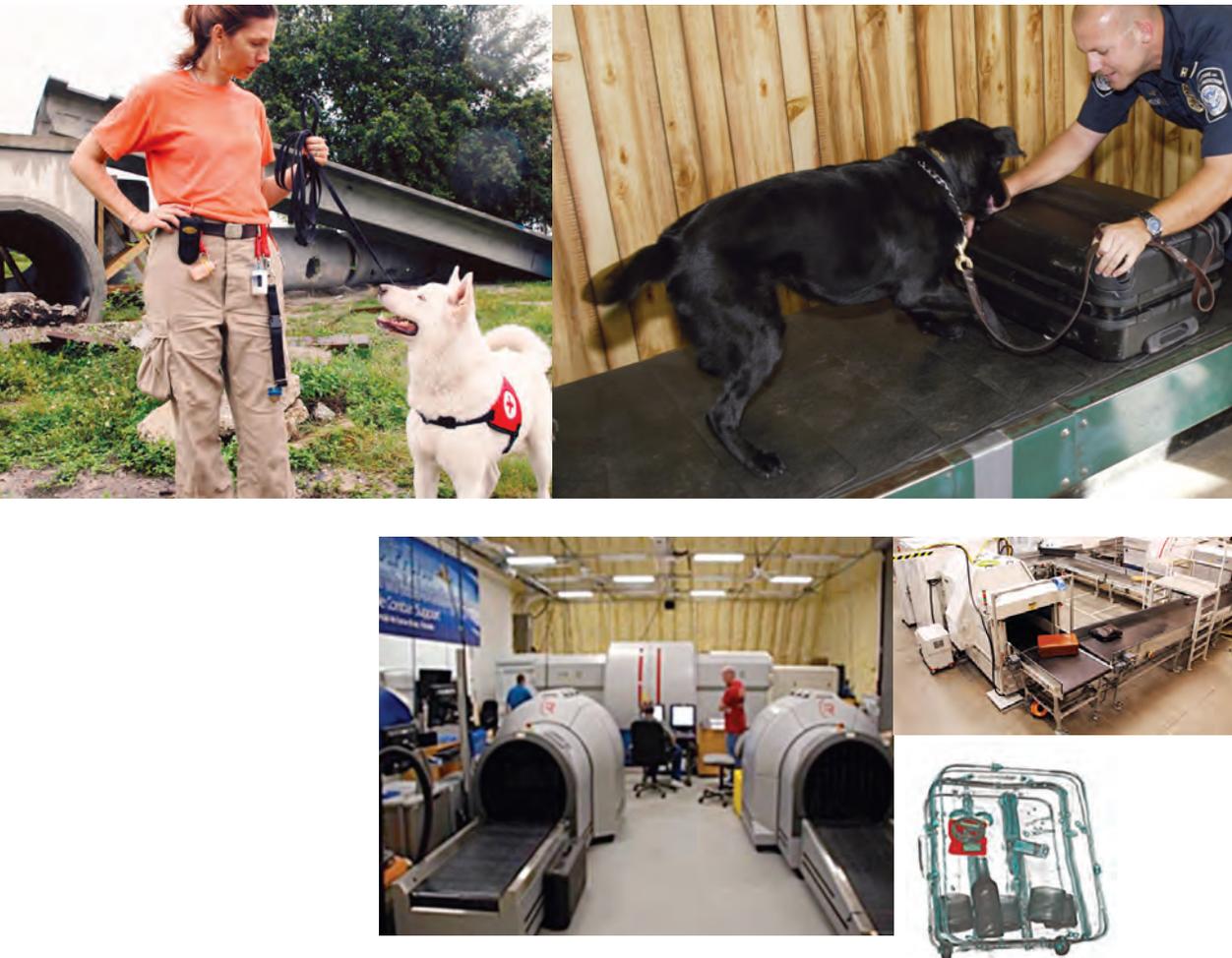
Explosives Division

Checkpoint Program

EXD is developing the next-generation threat detection system for TSA passenger checkpoints to screen out evolving threats while improving the passenger experience by allowing higher throughput and less intrusive security—passengers would be allowed to wear shoes, carry liquids, etc. To accomplish this, EXD is developing new personnel and carry-on baggage screening technology to improve detection capability and performance at checkpoints, and conducting test and evaluation of systems and components.

In FY 2011:

- EXD demonstrated a common screener interface for multiple checkpoint security technologies.



Human Factors and Behavioral Sciences Division

Rapid DNA

The Human Factors and Behavioral Sciences Division's (HFD's) Rapid DNA program conducts rapid and low-cost DNA-based biometric verification of family relationships to speed asylum requests, assist in refugee identification, and aid in overseas adoptions. The ability to verify relationship claims in the field will make processing legal immigration applications more efficient and deter fraudulent claims.

In FY 2011:

- The Rapid DNA program leveraged \$17 million of DoD, Department of Justice, and intelligence community funds to develop prototypes for U.S. Citizenship and Immigration Services to verify parent-child relationships in refugee cases. This work built upon existing partnerships in the White House National Science and Technology Council Subcommittee on Biometrics and Identity Management that the division co-chairs.
- Ongoing prototype acceptance testing and field testing in FY 2012 will validate the operational effectiveness of rapid DNA, while further development will expand the relationships to support expanded refugee, asylee, and adoption cases.

Screening Passengers by Observation Techniques Validation of Behavior-Based Screening Techniques

The Human Factors and Behavioral Sciences Division's Screening Passengers by Observation Techniques (SPOT) Validation program is the first large-scale, empirical validation study of operational behavior-based screening indicators. The American Institute for Research designed the Base Rate Study for HFD to compare TSA's SPOT Referral Report process with a random screening process. Findings showed that SPOT identifies higher-risk travelers at a significantly higher rate than random screening, and a high-risk traveler is more than four times more likely to be identified using SPOT than using random screening. Moreover, to achieve these outcomes, officers were able to engage with 50,000 fewer travelers using Operational SPOT than they did when using random selection methods.

In FY 2011:

- TSA used the study to support its request to Congress to release additional funds for the program.
- The study findings were transitioned to TSA.



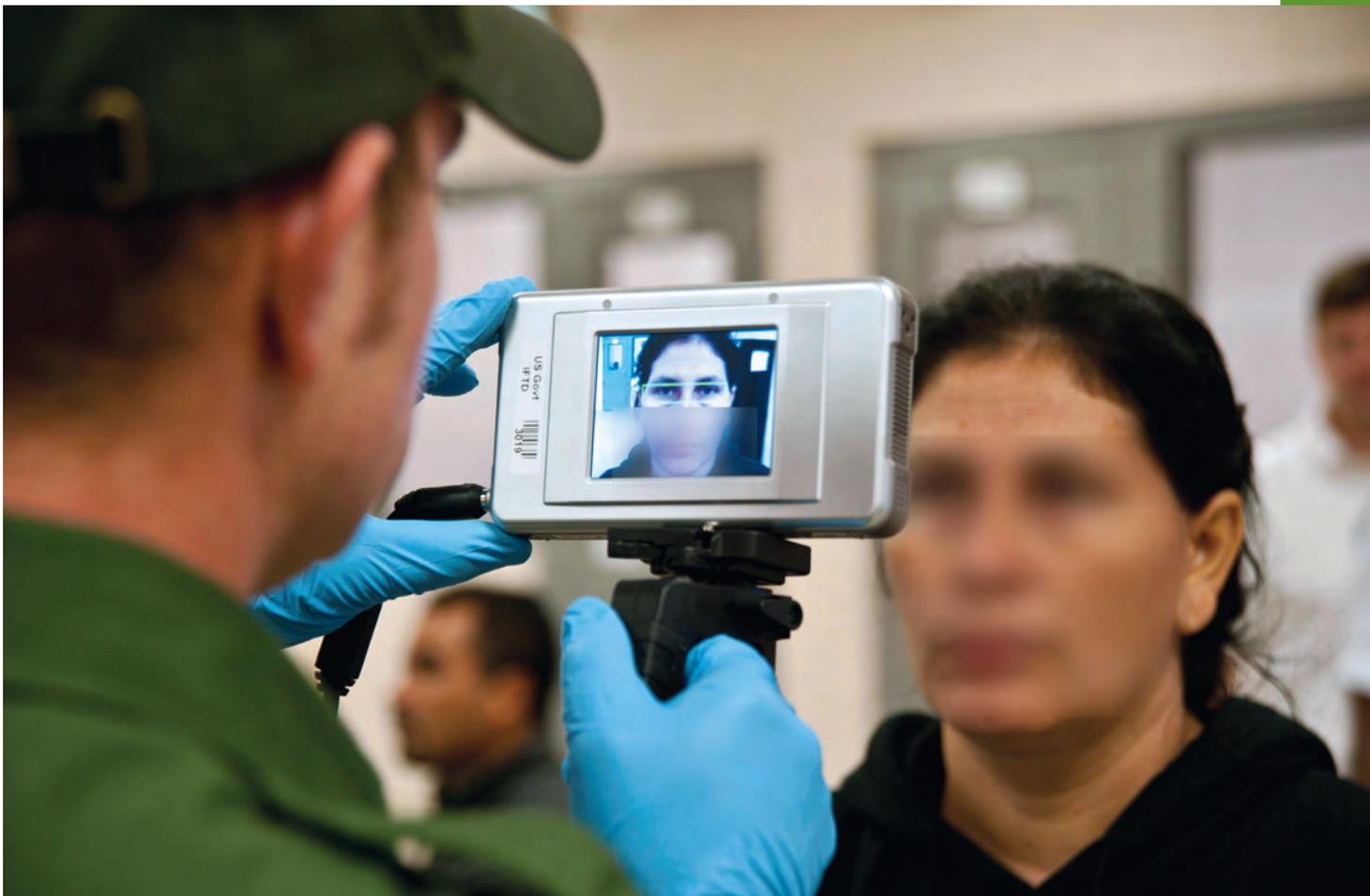
Human Factors and Behavioral Sciences Division

Multi-Modal Biometrics

The Multi-Modal Biometrics applied research project is focused on leading the near-term transition of iris and facial biometric recognition capabilities into daily DHS operations. Working in collaboration with interagency partners, including DoD and the National Institute of Standards and Technology (NIST), S&T is sponsoring research to mitigate remaining technical challenges, develop more robust biometric standards, and design common test methods to evaluate biometric technologies for reduced risk in future acquisitions.

In FY 2011:

- HFD sponsored research that enabled NIST to define standards for iris image quality and examine the performance of iris recognition on large-scale systems.
- HFD performed field evaluations of iris technologies in two DHS operational environments (USCG and CBP).
- HFD developed draft test protocols that will allow third-party laboratories to evaluate biometric vendor products based on DHS performance requirements.
- HFD initiated two related Small Business Innovation Research projects related to iris image quality and mitigation of factors that may limit iris recognition performance.



Infrastructure Protection and Disaster Management Division

Controlled Impact Response Tool

The Controlled Impact Response Tool (CIRT) is a concrete breaching tool that enables Urban Search & Rescue (USAR) teams to penetrate reinforced concrete walls up to four times faster than traditional methods. Faster breaching times translate into shorter time needed to reach a victim—increasing operator and victim safety, and the probability of success during a rescue mission. CIRT uses blank ammunition cartridges to drive a piston that generates a high-energy jolt to create a contained hole in the concrete. A series of these holes allows the creation of an area large enough to deliver vital supplies, such as food, water, and medicine to victims while first responders work to rescue them.

In FY 2011:

- Federal Emergency Management Agency (FEMA), acquired six CIRT units to increase its search-and-rescue capabilities.
- S&T distributed CIRT units to municipal search-and-rescue teams in Cincinnati, Ohio; Los Angeles, California; Seattle, Washington; Fairfax County, Virginia; Virginia Beach, Virginia; and Texas Disaster City, a training ground used by Urban Search and Rescue specialists.



Infrastructure Protection and Disaster Management Division

Geospatial Location Accountability and Navigation System for Emergency Responders

The Geospatial Location Accountability and Navigation System for Emergency Responders (GLANSER) is a system of sensors that enables incident commanders to accurately locate and track first responders anywhere in an incident environment—in three dimensions—providing real-time information on where their personnel are located. A stable, reliable, and robust system able to operate under challenging conditions, this technology allows emergency managers, including fire chiefs and other incident commanders, to rapidly and effectively deploy and redeploy their forces while better understanding the environment and potential consequences of their decisions.

In FY 2011:

- GLANSER was demonstrated at the International Association of Fire Chiefs Conference in Atlanta, Georgia.
- GLANSER was integrated and transitioned to fire departments across the United States.

Sport Evacuation Tool

Sport Evacuation Tool (SportEvac) is a computer modeling software program that draws on architecture computer-aided design data and creates 3-D virtual models of sports stadiums. This software simulates evacuations for venue operators and security planners to determine the safest movement of venue participants, allowing planners to optimize security plans and procedures.

In FY 2011:

- A SportEvac simulation was run during planning for the Super Bowl in Indianapolis, Indiana.
- Kickoff meetings were held for the upcoming use of SportEvac at the Verizon Center in Washington, D.C., and the 2012 Republican and Democratic National Conventions.



Apex

Science and Technology Operational Research and Enhancement

Science and Technology Operational Research and Enhancement (STORE) project supports S&T's goal to rapidly develop and deliver technology solutions to be integrated into homeland security operations. It is the first Apex project and was initiated under the leadership of the Under Secretary for Science and Technology and the Director of the U.S. Secret Service (USSS). Jointly staffed by S&T and the USSS, the

project's purpose is to arm USSS personnel with better technology to enhance the USSS protective mission. STORE has two goals. The first is to improve USSS acquisition processes and budget planning. This will enable the USSS to streamline and accelerate the acquisition of the advanced technologies it needs to perform its vital mission. The second goal, which is dependent on the first, is to deploy cutting-edge technology—both new and emerging—to strengthen USSS protective operations. The resulting products will help USSS personnel protect high-level government leaders.



Secure Transit Corridors Technology Demonstration Project

The Security Transit Corridors Technology Demonstration project will provide CBP and industry participants with security visibility of cargo conveyances entering the United States. This is accomplished by evaluating an Electronic Chain of Custody (ECoC) security device and its back-end analytic capabilities on four supply chain routes, both truck and rail, originating in Canada and Mexico and ending in the United States. The ECoC and system will detect

unauthorized door openings, anomalies, and events, as well as provide encrypted in-transit tracking throughout the international supply chain. The goal of the project is to provide CBP with the security standards to create secure transit corridors for Customs-Trade Partnership Against Terrorism (C-TPAT) Tier III members. This is intended to expedite the movement of C-TPAT Tier III members' intermodal cargo shipments at border crossings and to ensure such cargo shipments are not used for illegal activity.



HSARPA Projects at a Glance

Borders and Maritime Security Division

- CanScan
- Composite Container
- Ground Based Technologies
- Person In the Water
- Port and Coastal Surveillance Improvement
- Port Security Testbed
- SAFECON
- Small Dark Aircraft
- Small Dark Vessels
- Tunnel Activity Monitoring
- Tunnel Detection

Chemical and Biological Defense Division

- Agricultural Screening Tools
- Autonomous Rapid Facility Chemical Agent Monitor (ARFCAM)
- Bio Terrorism Risk Assessment
- Bioassays
- Bio-Defense Knowledge Center
- Bio-Forensics Operations
- Bio-Forensics R&D
- Bio-Threat Characterization
- Chemical Forensics and Attribution
- Chemical Infrastructure Risk Assessments
- Chemical Security Analysis Center
- “Detect-to-Protect” Bio-Aerosol Detection Systems (D2P)
- Foreign Animal Disease Modeling (FAD)
- FAD Vaccine & Diagnostics
- Integrated Consortium of Laboratory Networks
- Integrated Terrorism Risk Assessment
- Multi-Application Multiplex Technology Platform
- Next Generation Bio Detection
- Operational Tools for Response and Restoration
- Rapid Biodetection
- Underground Transport Restoration
- Viable Bioparticle Capture

Cyber Security Division

- Cyber Economic Initiatives
- Cyber Security Assessment and Evaluation
- Cyber Security Competitions
- Cyber Security Forensics
- Domain Name System Security Extensions (DNSSEC)
- Enterprise Level Security Metrics and Usability
- Experimental Research Testbed
- Experiments and Pilots

- Identity Management & Data Privacy Technologies
- Internet Measurement and Attack Modeling
- Leap Ahead Technologies
- Linking the Oil and Gas Industry to Improve Cybersecurity (LOGIIC)
- Moving Target Defense
- Process Control Systems Security
- Research Data Repository
- Secure Protocols
- Software Assurance Marketplace
- Tailored Trustworthy Spaces
- Transition to Practice

Explosives Division

- Air Cargo
- Aircraft Vulnerability Tests
- Algorithm and Analysis of Raw Images
- Canine Explosives Detection
- Checked-Baggage Program
- Checkpoint Program
- Homemade Explosives Characterization
- MagViz
- Mass Transit
- Next-Generation Passenger Checkpoint
- Person Borne Improvised Explosives Devices

Human Factors and Behavioral Sciences Division

- Biometrics
- Human Systems Engineering
- Predictive Screening Project
- Rapid DNA

Infrastructure Protection and Disaster Management Division

- Advanced Incident Management Enterprise System
- Controlled Impact Response Tool (CIRT)
- Geospatial Location Accountability and Navigation System for Emergency Responders (GLANSER)
- Overhead Imagery Data
- Recovery Transformer
- Resilient Electric Grid
- Sport Evacuation Tool (SportEvac)
- Standard Unified Modeling Mapping Integrated Toolkit

Apex

- Science and Technology Operational Research and Enhancement (STORE)
- Secure Transit Corridors Technology Demonstration Project



III. S&T Accomplishments

Acquisition Support and Operations Analysis (ASOA)



Acquisition Support and Operations Analysis

Mission

The Acquisition Support and Operations Analysis (ASOA) group is a customer-driven organization to support S&T and components with systems analysis; requirements analysis and development; and advisory services to achieve successful acquisition implementation. Through the engagement and partnership with the Homeland Security Enterprise (HSE), ASOA provides the corporate oversight of operational test and evaluation, standards, and the management of two Federally Funded Research and Development Centers (FFRDCs): the Homeland Security Studies and Analysis Institute (HSSAI) and the Homeland Security Systems Engineering and Development Institute (HS SEDI).

The Acquisition Support and Operations Analysis group is able to leverage S&T's knowledge, expertise, and technical resources across DHS and work closely with the Under Secretary for Management to improve the requirements gathering process and acquisition support to the components. ASOA leverages S&T's critical mass of technical capability across DHS to:

- manage the S&T-wide process of helping DHS components and other user communities articulate their operational needs, then identifying and matching those needs to technology or knowledge solutions that offer a high potential of quickly meeting their needs and transitioning to operational use;
- guide the framing and execution of analysis of alternatives and other trade studies to support the selection of the most appropriate solutions;
- provide, in coordination with the Under Secretary for Management, expert support to the components as they implement DHS acquisition policies to establish and execute their acquisition activities, with an emphasis on systems engineering, systems analysis, and test and evaluation;
- establish DHS-wide test and evaluation policies and procedures; serve as DHS's independent authority for operational test and evaluation; and serve as a member of the Department's Investment Review Boards;
- support the development of standards that meet DHS-wide mission needs, promote their use, and provide S&T's customers with reliable, interoperable, and effective technologies and processes;
- conduct research, development, and validation of solutions to detect and mitigate the threat of explosives at the DHS S&T Transportation Security Laboratory; and
- help components use DHS's FFRDCs, HSSAI, and HS SEDI.

Over the next several pages, a few projects have been highlighted from each ASOA group.

Capstone Analysis and Requirements Office

The Capstone Analysis and Requirements Office (CAR), in close coordination with the Office of Systems Engineering (SYS), supports the S&T Resource Allocation Strategy by providing subject matter expertise and the organic and nonorganic operations analysis services/support required to meet the analytical needs of S&T R&D programs, and the acquisition programs of other DHS directorates and components, in all DHS Acquisition Lifecycle Framework phases.

In FY 2011:

- ASOA's CAR is the co-chair of the DHS/DoD Homeland Security Air Surveillance Analysis of Alternatives Effectiveness Analysis working group, an interagency group responsible for evaluating alternative approaches to support critical U.S. air surveillance operations. This working group developed five attack scenarios based on geographic areas: Northeast Corridor; Southern Border; Far North; Denver, Colorado; and Northern Border.
- ASOA partnered with the U.S. Coast Guard (USCG) to enhance the Operational Risk Assessment Model. ASOA provided the focus, scope, and application to enhance a successful port security version of the DHS Center for Risk and Economic Analysis of Terrorism Events' intelligent game theory-based randomization model for defending critical infrastructure.

The two DHS FFRDCs—the HSSAI, and the HS SEDI—provide broad and deep technical support for the acquisition and employment of mission information capabilities across the Homeland Security Enterprise (HSE). HSSAI and HS SEDI collectively perform mission-level analysis and systems engineering throughout the DHS enterprise.

In FY 2011:

- HSSAI examined issues, including emergency preparedness; response and recovery; and counterterrorism, borders, and immigration, and completed three studies:
 1. Developing Resilience Profiles provided an analytically based method for relating estimated features of a resilient system to the creation of a “resilience profile.” The profile characterizes the behavior of that system in terms of a set of defining parameters, with emphasis on community systems.
 2. DHS Requirements Generation Process initiated a process for DHS to conduct rigorous, standardized analyses to determine requirements. This process is foundational, as the Department can use it to determine optimal, cost-effective, and operationally efficient solutions for any of its mission needs.
 3. A Strategic Look at Cybersecurity Policy assessed the complex policy issues surrounding the Department's role in cybersecurity and recommended strategies for improving the Department's implementation of those policies.
- HS SEDI leveraged best practices and lessons learned to advise major DHS acquisition programs on successful enterprise “IT Paths;” applied systems engineering expertise and FFRDC objectivity to combat human trafficking; helped DHS shape a national dialog on cybersecurity; provided technical assessments ensuring fault tolerance and continuity of DHS operations for the volatile DHS Classified Local Area Network; and provided advice for deploying the Information-Sharing Enterprise.

Office of Systems Engineering

The Office of Systems Engineering (SYS), working closely with the CAR, provides systems engineering advice and services to the Department and S&T to strengthen the DHS acquisition processes. The main areas of responsibility include requirements development, systems engineering strategic planning, process management, programmatic risk management, and systems engineering subject matter expertise.

In FY 2011:

- ASOA, in partnership with S&T's First Responders Group, established a joint working group to develop a technology roadmap for the DHS-wide Next Generation Wireless Broadband Tactical Communications Capability. ASOA's engagement early on in the acquisition requirements process will help to better define and characterize the operational needs of the end users.
- ASOA's Office of Systems Engineering led the development of the Cargo Release Technical Trade Study in support of CBP's Automated Commercial Environment (ACE) program. The study identified viable alternatives for implementing cargo release and performed a technical trade study for these alternatives, as well as a rough-order-of-magnitude cost estimation range for each alternative. This study will help shape an Analysis of Alternatives for ACE.

“It was evident that partnering with DHS S&T was essential for achieving success”...“by partnering with S&T the DHS TacNet program is instantly able to engage scientists, engineers, research labs, and acquisition specialists to ensure that we can develop and deploy effective solutions that enhance our mission capabilities and enable us to better secure the American homeland.”

— *DHS Joint Wireless Program Executive Director Mr. John Santo*

Test & Evaluation and Standards Office

The Test & Evaluation and Standards Office (TES) is responsible for establishing policies and programs to support the development, coordination, and operational management of test and evaluation (T&E) standards for assigned infrastructure. TES establishes T&E policy and procedures for DHS; provides independent T&E oversight and assessment for major acquisition programs; and catalogs DHS organic and non-DHS T&E capabilities in a database that can be accessed by all components.

In FY 2011:

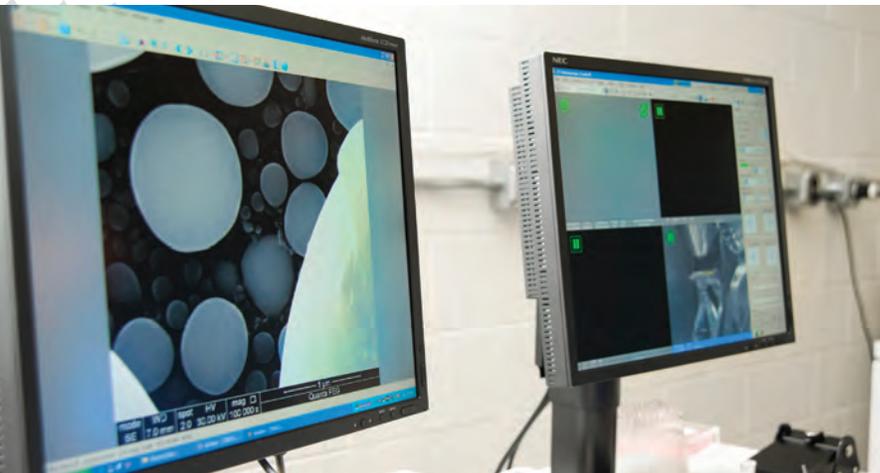
- Through T&E efforts, DHS completed the operational testing of eight major acquisition programs and completed Director, Operational Test & Evaluation Letters of Assessment that provided the independent assessment of the operational testing.
- TES published a national strategy for the chemical, biological, radiological, nuclear, and explosives standards.
- “National Response Framework for a Biothreat Field Response Mission Capability” was published for use in the field assessment of suspicious powders for *Bacillus anthracis* (Ba, the causative agent of anthrax).

System Assessment and Validation for Emergency Responders

System Assessment and Validation for Emergency Responders (SAVER) conducts impartial, practitioner-relevant, operationally oriented assessments and validations of commercial off-the-shelf equipment that falls within the categories listed in the DHS Authorized Equipment List.

In FY 2011:

- SAVER produced 13 assessment reports, 19 market survey reports, 16 focus group reports, 31 other knowledge products, and 69 Individual Product Assessed reports. In addition, SAVER users requested and downloaded 46,890 publications.



The Transportation Security Laboratory (TSL) is the leading federal laboratory for the applied research, development, integration, and validation of technology solutions for the detection and mitigation of explosives and conventional weapons threats.

In FY 2011:

- The Explosive Effects and Survivability Group completed development and successful explosive mitigation testing of a reduced weight and reduced cost, blast-resistant, widebody commercial aircraft air cargo container known as a Hardened Unit Load Device (HULD). The HULD design finalization of the Federal Aviation Administration’s airworthiness certification process is scheduled to be completed by March 2012.
- TSL completed more than 50 test events to qualify and certify Transportation Security Administration requested performance systems.

Test & Evaluation and Standards Office

List of Standards

Five biometric standards were adopted as DHS National Standards:

1. INCITS/ISO/IEC 19794-5:2005[2007]—Information technology biometrics data interchange formats Part 5: Face image data;
2. INCITS/ISO/IEC 19794-5:2005 AM 1-2007[2009]—Information technology biometrics data interchange formats Part 5: Face image data Amendment 1: Condition for taking photographs for face image data;
3. ANSI/NIST -ITL 1-2007 American National Standard for Information Systems Data Formats for the Interchange of Fingerprint, Facial, & Other Biometric Information;
4. ANSI/NIST -ITL 2-2008 American National Standard for Information Systems—Data Formats for the Interchange of Fingerprint, Facial, & Other Biometric Information—Part 2: XML Version; and
5. ANSI/NIST ITL 1a-2009 Update to: Data Formats for the Interchange of Fingerprint, Facial, & Other Biometric Information for multiple finger captions designations.

Three Standard Method Performance Requirement (SMPR) bio-threat detection standards were adopted:

1. SMPR 2010.001 Standard Method Performance Requirements for Polymerase Chain Reaction (PCR) Methods for Detection of *Francisella tularensis* in Aerosol Collection Filters and/or Liquids;
2. SMPR 2010.002 Standard Method Performance Requirements for Polymerase Chain Reaction (PCR) Methods for Detection of *Yersinia pestis* in Aerosol Collection Filters and/or Liquids; and
3. SMPR 2010.003 Standard Method Performance Requirements for Polymerase Chain Reaction (PCR) Methods for Detection of *Bacillus anthracis* in Aerosol Collection Filters and/or Liquids.

Two international standards for measurement and characterization of suspicious powders were developed:

1. ASTM E2805, standard practice for the measurement of the biological activity of Ricin; and
2. ASTM E2800, standard practice for the characterization of *Bacillus* spore suspensions for reference materials.



III. S&T Accomplishments

Research and Development Partnerships (RDP)



Research and Development Partnerships (RDP)

Mission

The Research and Development Partnerships (RDP) group builds enduring partnerships to deliver technological solutions to the Homeland Security Enterprise (HSE) resourcefully and swiftly. Possessing a broad range of experience and skills, RDP's experts reach across the HSE to cultivate shared ways to meet shared challenges. It's an urgent mission that demands close cooperation across the enterprise and among the group's six divisions: the Interagency Office (IAO), the International Cooperative Programs Office (ICPO), the Office of National Laboratories (ONL), the Office of Public-Private Partnerships (PPP), the Office of University Programs (OUP), and the Special Projects Office (SPO). RDP also executes the Homeland Security Science and Technology Advisory Committee (HSSTAC) and coordinates interactions with the White House through the Office of Science and Technology Policy.

Initiatives

The Research and Development Partnerships group was established in FY 2011. During its first year the RDP group initiated a new SECURE (System Efficacy through Commercialization, Utilization, Relevance and Evaluation) program, which fosters cooperative win-win partnerships between DHS and the private sector by providing certification to private sector-developed technologies whose performance has been validated to meet DHS requirements. Another new initiative is the Engage-to-Excel (E2E) program with our S&T's Centers of Excellence (COEs), which is designed to increase COE researchers' interaction with end users early in the research development process and through project completion and transition. It also awarded eight career development grants, 44 summer internships, 10 scientific leadership awards, and six summer research team grants. Our National Biodefense Analysis and Countermeasures Center (NBACC) was approved for Biosafety Level 4 (BSL-4), one of only six labs across the country that have this certification, and enables S&T to fully realize and execute its bio-forensics and threat characterization mission. Through the Technology Transfer Office, DHS signed 31 new Cooperative Research And Development Agreements (CRADAs) to work with industry (both domestically and internationally), academia, and consortia. The ICPO managed nine current and prior-year international research grant awards in science and technology for homeland security with seven U.S. universities and 14 international partners in nine countries. Additionally, as a result of negotiations led by ICPO and the DHS Office of the General Counsel, Secretary Napolitano signed the two new S&T sharing agreements with the European Commission and with Spain. The Small Business Innovation Research (SBIR) program FY 2011 solicitations resulted in 198 proposals from 32 states and resulted in 34 awards totaling approximately \$3.4 million. Additionally, the SBIR program awarded nine Phase II contracts totaling approximately \$7.6 million to small businesses located in six states as a result of the FY 2010 solicitations.

Under the new Technology Foraging Pilot Program, RDP crafted a methodical approach by which each S&T project manager would identify and evaluate existing or emerging technologies, services, and trends before spending a dime on development. To learn how to forage and who could help, a Technology Foraging working group enlisted advice from components, companies, and other agencies. A six-month pilot was launched to evaluate ways and means by which to find and evaluate promising technologies for meeting the HSE's needs without reinventing the wheel.

Over the next several pages, a few projects have been highlighted from each RDP division.

Interagency Office

The Interagency Office (IAO) serves as S&T's lead facilitator in developing partnerships between S&T and the interagency members of the Homeland Security Enterprise (HSE). It conducts outreach with interagency partners, including state and local governments, to strengthen collaborative efforts and collect input on their technology gaps. It also coordinates DHS roles in and input into the National Science and Technology Council and its various groups. Partnerships with other federal agencies are focused on sharing information relative to the research, development, and test and evaluation (RDT&E) requirements and capabilities of both the directorate and its partners.

In FY 2011:

- IAO served as the S&T lead on the DoD–DHS Capability Development Working Group Senior Steering Committee, which provided a senior-level forum to explore capability development topics of mutual interest; ensured best ways to use resources and avoid duplication of effort; promoted cooperation; and supported/informed policy, planning, and decision-making activities.
- IAO conducted interagency outreach and coordination with the National Guard and U.S. Northern Command to support interagency efforts to establish a Homeland Defense/Homeland Security (HD/HS) Capabilities Forum to enable awareness, synchronization of, and interest in finding solutions to HD/HS capability gaps.
- IAO operated the DHS Center of Innovation (COI) at the United States Air Force Academy. The COI has evolved rapidly into a significant public–private collaboration facility. Major components from the interagency, particularly the Intelligence Community, have joined with the COI to collaborate with the private sector on major computer processor-based research with a focus on improving how government communicates and works.
- Partnered with the Department of Defense's (DoD) Joint Capability Technology Demonstration Program for developing a successful tunnel detection technology, and developed a strategic partnership with U.S. Northern Command for transitioning the DHS/DoD jointly-developed tunnel detection technology.

“Given the complex and evolving range of threats to nations in this international community, homeland security and justice partnerships have become an essential element in the success of our shared security.”

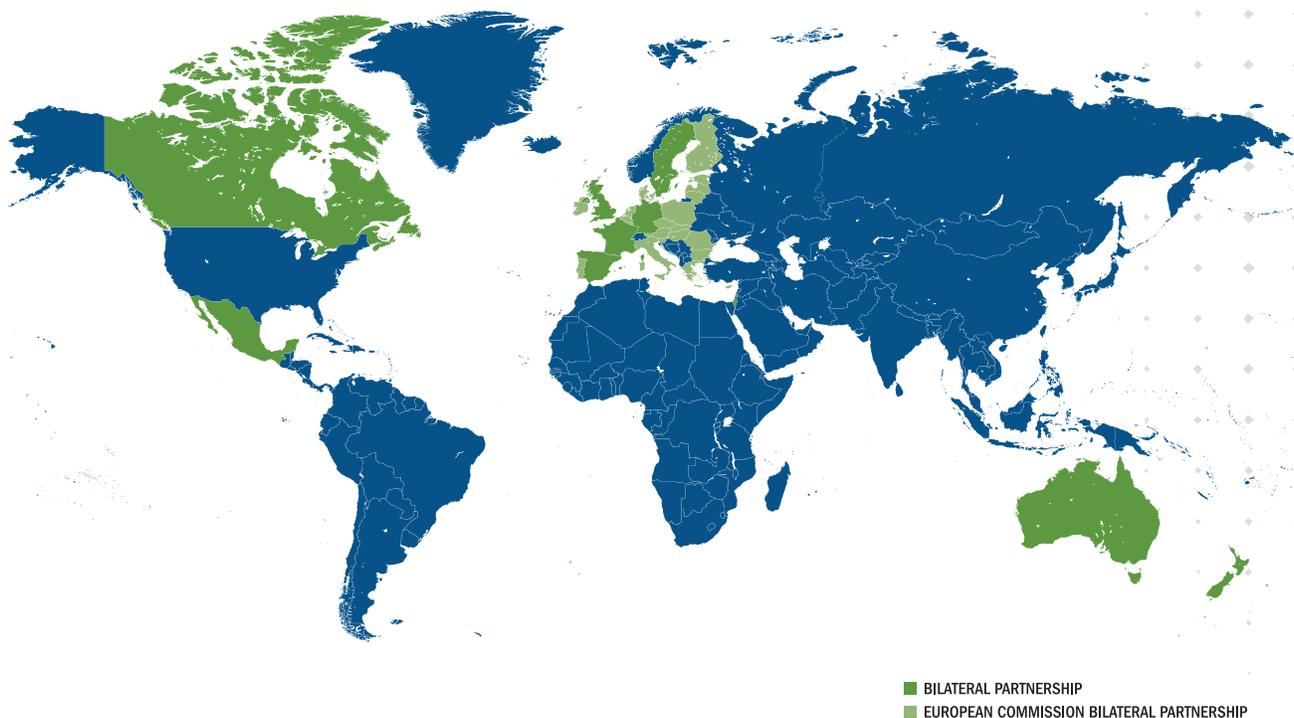
— *DHS Secretary Janet Napolitano*

International Cooperative Programs Office

The International Cooperative Programs Office (ICPO) advances the vital mission of securing the nation through international collaborative research partnerships. ICPO facilitates the planning, development, and implementation of international cooperative activity to address the strategic priorities S&T considers appropriate, including grants, cooperative agreements, or contracts to or with foreign public or private entities, governmental organizations, businesses, federally-funded research and development centers, and universities.

In FY 2011:

- The ICPO managed agreements on cooperation in science and technology for homeland security with 12 formal bilateral partners, listed in chronological order of date of agreement signature: Canada, the United Kingdom, Australia, Singapore, Sweden, Mexico, Israel, France, Germany, New Zealand, the European Commission, and Spain.
- As a result of negotiations led by ICPO and the DHS Office of the General Counsel, Secretary Napolitano signed the two newest S&T agreements, one with the European Commission and the other with Spain.
- The ICPO managed nine current and prior-year international research grant awards in science and technology for homeland security with seven U.S. universities and 14 international partners in the European Commission and nine countries: the United Kingdom, Sweden, Italy, Germany, Colombia, Costa Rica, the Netherlands, Canada, and Argentina.
 1. Previous ICPO grant recipients generated 18 peer-reviewed knowledge products in areas such as foreign animal disease epidemiological modeling, preventing progressive collapse in damaged buildings, and standoff detection of concealed weapons or explosives.
 2. The DHS Transportation Security Laboratory filed a U.S. invention disclosure related to a tamper-evident tape developed as part of a U.S.–Canada cooperative activity facilitated by ICPO.
 3. Purdue University filed an invention disclosure for a Fingerprint Acquisition System and Method Using Force Measurements as a result of a 2009 ICPO grant award for Enhancing High-Fidelity Ten-Print Capture for Department of Homeland Security Applications.
 4. The University of Connecticut filed an invention disclosure for Fluorescence Nanofibrous Membranes for Fast Screen of Explosive Vapors, Improvised Explosive Devices, and Landmines as a result of a 2008 grant award for a Novel Explosives Sensor Using Signal-Amplifying Molecularly Imprinted Conducting Polymer.



Office of National Labs

The Office of National Laboratories (ONL) develops and utilizes a coordinated network of S&T laboratories and Department of Energy (DOE) national laboratories to facilitate delivery of enduring capabilities vital to DHS and the national homeland security mission. This extensive network of laboratories house some of the most advanced scientific expertise and capabilities in the world. As a result, the HSE is able to leverage, transfer, and apply this wealth of expertise to inform policy, improve operations, and advance research in support of homeland security.

In FY 2011:

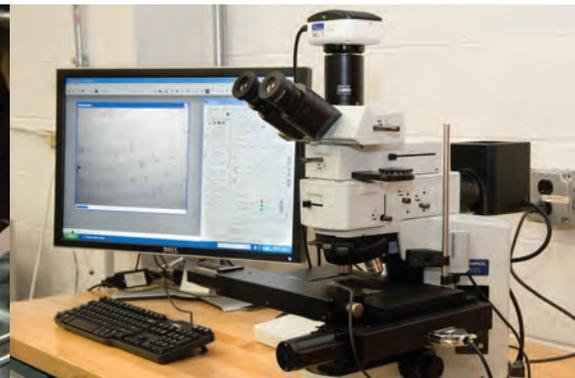
- ONL completed more than 500 appropriateness reviews of interagency agreements (IAA) for DHS RDT&E to be performed by the DOE national laboratories, and worked closely with DOE to streamline the IAA process, significantly increasing efficiency in RDT&E project initiation.
- DHS signed 31 new CRADAs to work with industry (both domestically and internationally), academia, and consortia.
- As a result of a Joint Technology Transfer Initiative between DHS, the Maryland Technology Development Corporation, and the U.S. Army Medical Research and Materiel Command, DHS entered into three CRADAs with small businesses that received \$75,000 in support of their efforts with DHS.
- RDP signed a Memorandum of Understanding with a partnership intermediary representing a coalition of government/federal laboratories to connect DHS with a network of industry, venture capital partners, economic development organizations, and academic institutions.
- In concert with the Office of General Counsel, the Technology Transfer Program started an initiative to mine for inventions. The initial effort resulted in 34 invention disclosures. In addition, DHS applied for 10 provisional patents.



*National Urban Security
Technology Laboratory*



Transportation Security Laboratory



Office of National Labs

The National Biodefense Analysis and Countermeasures Center (NBACC) is a national resource for understanding the risks posed by biological threats, bioterror, and biocrime.

In FY 2011:

- NBACC's BSL-4 lab sectors were registered with and accredited by the Centers for Disease Control and Prevention and the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Select Agent Program offices. As a result, research will be performed in-house, allowing DHS to fully carry out its mandate to perform bioforensics and characterize threats.

Since 1954, the Plum Island Animal Disease Center (PIADC) has served as the front line of the nation's defense against diseases that could devastate markets for livestock, meat, and other animal products. PIADC can diagnose foreign animal diseases (FADs) and domestic animal diseases that may resemble them. The center continued developing diagnostic tools as well as vaccines, antivirals, and other means for preventing or treating FAD, including Foot-and-Mouth Disease (FMD).

In FY 2011:

- To speed the development of an FMD vaccine, PIADC signed two CRADAs: one with Inovio Pharmaceuticals, the other with Benchmark Biolabs. Under a facility upgrade project, the center added BSL-3Ag animal holding space, doubling its onsite capacity to develop vaccines in cattle. The center also built a high-throughput lab to improve near-term research capabilities.
- Both necropsy spaces were renovated to allow the center to conduct more diagnostic procedures.

The National Bio and Agro Defense Facility (NBAF) in Manhattan, Kan., will be the nation's only large-livestock BSL-4 biocontainment facility for the study of zoonotic diseases. When completed, NBAF will be a state-of-the-art biocontainment facility where DHS will conduct research; develop diagnostic tools; develop vaccines and other countermeasures; and train veterinarians to recognize and treat FADs and emerging and zoonotic diseases that threaten the U.S. animal agriculture, the economy, and public health.

In FY 2011:

- ONL completed the Updated Site Specific Risk Assessment and site preparation activities, using gift funds from the State of Kansas. ONL's facilities branch completed the 65 percent design package.

The Chemical Security Analysis Center (CSAC) provides a scientific basis for confirming a chemical threat and attributing a chemical's use by a terrorist.

In FY 2011:

- CSAC continued to provide a centralized compilation of chemical hazard data to DHS (National Operations Center, TSA, CBP, Office of Health Affairs, S&T, Federal Emergency Management Agency, Office of Intelligence and Analysis), USDA, Department of Health and Human Services, FBI, and DoD, who are using it to assess the hazard posed by chemical threat materials.

ONL also works with the Transportation Security Laboratory, which is managed by S&T's Acquisition Support and Operations Analysis Group, and the National Urban Security Technology Laboratory which is managed by S&T's Homeland Security Enterprise and First Responders (FRG) Group, as part of its integrated network of S&T laboratories.



National Biodefense Analysis and Countermeasures Center



Plum Island Animal Disease Center

List of Labs:

- *National Biodefense Analysis and Countermeasures Center (NBACC)*
- *Plum Island Animal Disease Center (PIADC)*
- *National Bio and Agro Defense Facility (NBAF)*
- *Chemical Security Analysis Center (CSAC)*
- *Transportation Security Laboratory (TSL)*
- *National Urban Security Technology Laboratory (NUSTL)*

Office of Public-Private Partnerships

The Office of Public-Private Partnerships is composed of four offices: the Commercialization Office, the Small Business Innovation Research Program Office (SBIR), the Long-Range Broad Agency Announcement Office (LRBAA), and the Office of SAFETY Act Implementation.

Commercialization Office

The mission of the Commercialization Office is to develop and execute programs and processes that identify and evaluate privately owned technologies and commercialize them into products or services that meet the detailed operational requirements of DHS stakeholders. In particular, the office has had noteworthy success with the creation of the SECURE program and its execution of effective private sector outreach.

In FY 2011:

- S&T certified its first product under SECURE with the Blast Resistant Autonomous Video Equipment (BRAVE) forensic camera. This certification marked the culmination of a successful partnership among DHS, Department of Transportation, DoD, the mass transportation sector, and industry.
- The Commercialization Office released a Commercial Applications Requirements Document for a mobile water purification unit, expanding SECURE from a pilot to a full-fledged program.
- The Commercialization Office developed a company overview repository of information on more than 615 companies and more than 3,000 technologies, products, and/or services aligned with DHS capability gaps.

Small Business Innovation Research Program Office

The Small Business Innovation Research (SBIR) program, created in 1982 through the Small Business Innovation Development Act and reauthorized in 2011, is one of the largest public-private partnerships in the United States. The SBIR program encourages small businesses to provide quality research and to develop new processes, products, and technologies in support of the missions of the U.S. government.

In FY 2011:

- Two SBIR solicitations resulted in 198 Phase I proposal submissions from small businesses located in 32 states. Of these 198 proposals, 34 Phase I contracts, totaling \$3.4 million, were awarded to small businesses located in 14 states.
- Nine SBIR Phase II contracts resulting from the FY 2010 solicitations were awarded, totaling approximately \$7.6 million.
- Five SBIR Phase III awards were made, totaling approximately \$5.3 million in non-SBIR funding.
- Five SBIR-funded technologies were tested in the field.
- An S&T SBIR recipient and an S&T program manager/division chief were each awarded the prestigious Tibbetts Award.

A complete listing of SBIR's FY 2011 projects can be found on page 52 and 53.

Office of Public-Private Partnerships

Long-Range Broad Agency Announcement Office

The Long-Range Broad Agency Announcement (LRBAA) Office manages S&T's acquisition mechanism that solicits proposals for R&D projects addressing scientific and technological gaps in the HSE.

In FY 2011:

- The LRBAA Office received 554 white papers and 37 full proposal submissions. Small or disadvantaged businesses represented 19 percent of all white paper submissions and 14 percent of full proposal submissions.

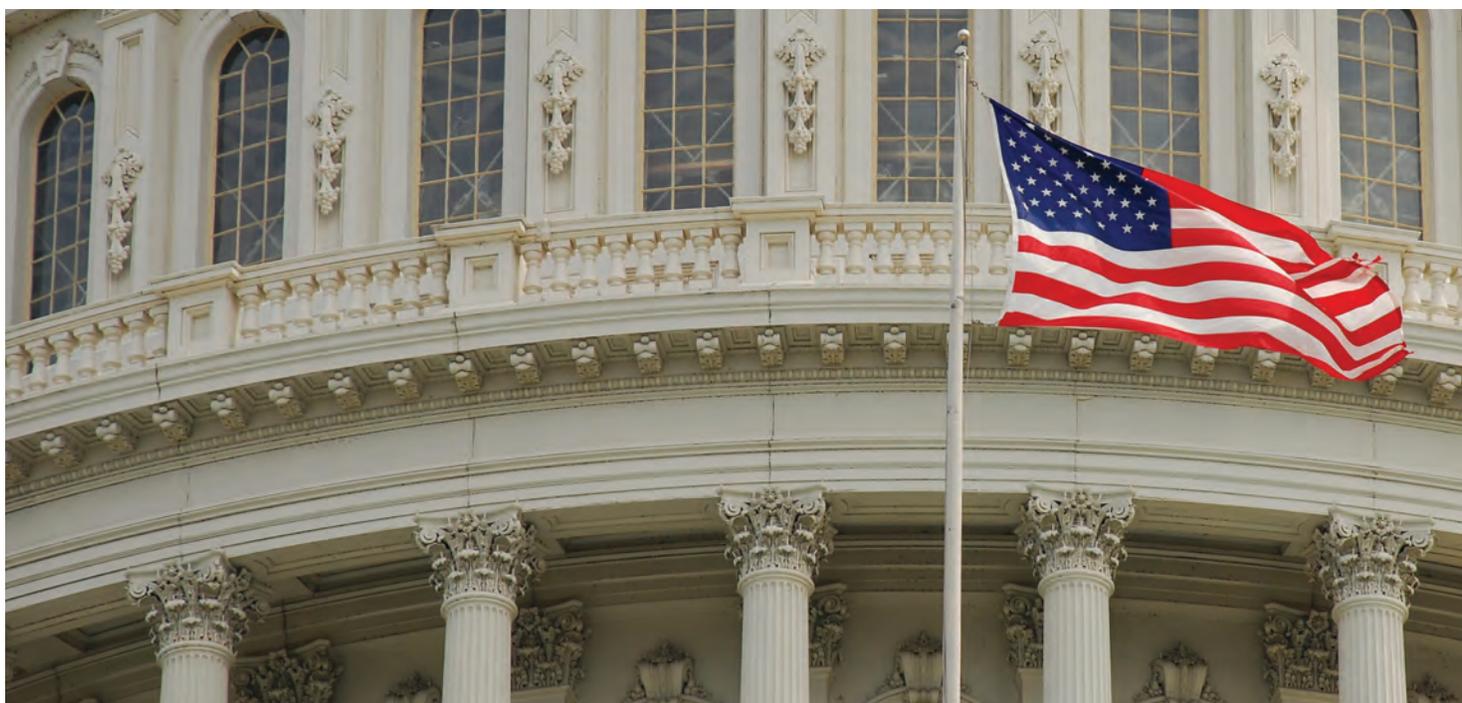
Office of SAFETY Act Implementation

The SAFETY (Support Anti-Terrorism by Fostering Effective Technologies) Act provides incentives for the development and deployment of effective anti-terrorism technologies and services through systems of risk and litigation management.

In FY 2011:

- A new evaluative capability allowed the SAFETY Act Program to complete complex reviews of applications for deployment and command and control of layered security capabilities at prominent and nationally significant venues, including the New York Stock Exchange and a major Midwestern airport.
- The SAFETY Act program approved a record-breaking 101 applications.
- SAFETY Act coverage was provided for the development, evaluation, and/or transition of seven S&T technologies.

A complete listing of SAFETY Act FY 2011 projects can be found in Appendix E on page 64.



Office of University Programs

The Office of University Programs (OUP) taps the expertise of the nation's colleges and universities to address pressing homeland security needs through three unique programs: Centers of Excellence (COE), OUP Education Programs, and the Minority Serving Institutions (MSI) Program.

In FY 2011:

- OUP launched the Engage-to-Excel (E2E) initiative with the S&T COEs. E2E increased COE researchers' interaction with end users at every phase, from early in the research development process to project completion and transition.
- The number of COE-generated products in use by DHS components, other federal agencies, and first responders grew considerably.
- The Center for the Study of Terrorism and Responses to Terrorism (START), led by the University of Maryland, was granted an award to operate a DHS S&T Center of Excellence for the Study of Terrorism and Behavior through 2016.
- OUP awarded eight Career Development Grants, 10 Scientific Leadership Awards, and six Summer Research Team grants.
- OUP initiated a focused effort to improve the transition of COE tools and technologies to end users.

List of COEs (For a full list of partners by state, see Appendix A on page 57.)

- *Center for Risk & Economic Analysis of Terrorism Events (CREATE)*
- *National Center for Zoonotic & Animal Disease Defense (ZADD)*
- *National Center for Food Protection & Defense (NCFPD)*
- *National Consortium for the Study of Terrorism and Responses to Terrorism (START)*
- *The Center for Visual and Data Analytics (CVADA)*
- *The Center for Awareness and Location of Explosives-Related Threats (ALERT)*
- *The National Center for Border Security and Immigration (NCBSI)*
- *The Center for Maritime, Island, Remote and Extreme Environment Security (MIREES)*
- *Coastal Hazards Center (CHC)*
- *National Transportation Security COE (NTSCOE)**
- *Center for Advancing Microbial Risk Assessment (CAMRA)**
- *Center for the Study of Preparedness & Catastrophic Event Response (PACER)**

**did not receive funding in FY 2012*

“The DHS University Programs Centers of Excellence initiative has demonstrated a significant positive return on investment. University contributions in developing new security technologies argues for additional investment.”

— *Northeastern University President Joseph E. Aoun*

Office of University Programs

Centers of Excellence Selected Projects

The National Center for Risk and Economic Analysis of Terrorism Events (CREATE), led by the University of Southern California, develops operations research, game theoretic, and economic tools to evaluate terrorism's risks, costs, and consequences.

In FY 2011:

- The U.S. Coast Guard (USCG) began a project to apply CREATE's Assistant for Randomized Monitoring Over Routes (ARMOR) randomized patrol and resource deployment tool to U.S. ports, starting with a pilot application in Boston Harbor.

The National Center for Border Security and Immigration (NCBSI), co-led by the University of Arizona and the University of Texas at El Paso, develops advanced methods and technologies to balance immigration and commerce with effective border security.

In FY 2011:

- The Automated Virtual Agent for Truth Assessments in Real-Time (AVATAR) screening technology, developed for use at ports of entry, was tested at a border checkpoint to screen low-threat travelers.
- The U.S. Customs and Border Protection Office of Border Patrol funded a Checkpoint Study project to assess the effectiveness of traffic checkpoint operations.

The Coastal Hazards Center of Excellence (CHC) performs research and develops education programs to enhance the nation's ability to safeguard populations, property, and economies from catastrophic natural disasters. CHC is co-led by the University of North Carolina and Jackson State University.

In FY 2011:

- The coupled ADvanced CIRCulation (storm surge)/SWAN (wave) model was used by the USCG during Hurricane Irene. Based on model results, the USCG relocated its operations to St. Louis before the storm struck the Virginia coast and was able to continue its critical operations during the hurricane, unabated.

The National Transportation Security Center of Excellence (NTSCOE), co-led by the University of Connecticut, Tougaloo College, and Texas Southern University, is a seven-institution consortium focused on developing new technologies, tools, and training to improve the resiliency of the nation's transportation infrastructure.

In FY 2011:

- The NTSCOE at Rutgers University produced three training videos for rail track workers on "Rail Sabotage Awareness and Reporting." TSA distributed 2,500 copies of the training video and 10,000 posters to 58 transit agencies and 565 freight railroad companies. The video includes a two-minute introduction by Secretary Napolitano, as it supports DHS's "If You See Something, Say Something" campaign.

Office of University Programs

The National Center for Food Protection and Defense (NCFPD), led by the University of Minnesota, defends the safety and security of the food system by countering vulnerabilities in the nation's food supply chain.

In FY 2011:

- NCFPD developed risk analysis approaches for U.S. food products that use imported ingredients to create a new supply-chain design.

The Center for Maritime, Island and Remote and Extreme Environment Security (MIREES) focuses on maritime domain awareness to safeguard populations and properties. MIREES is co-led by the University of Hawaii and Stevens Institute of Technology.

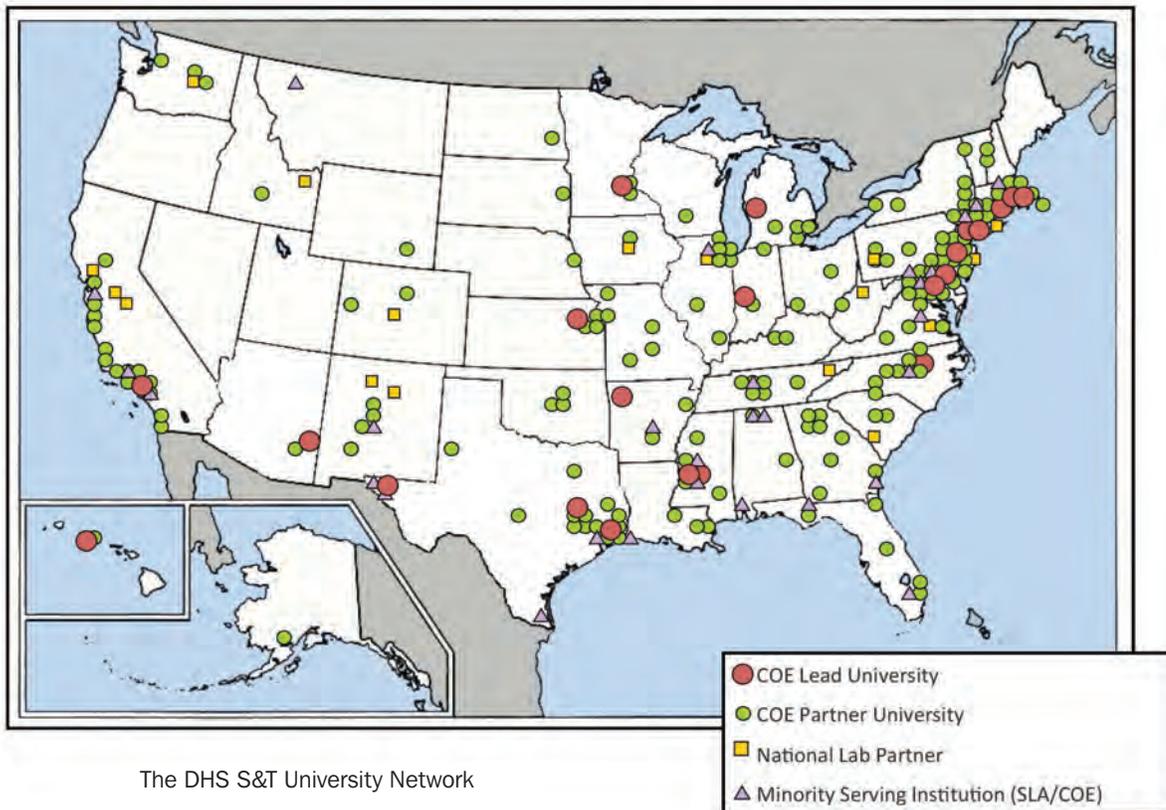
In FY 2011:

- The National Center for Island, Maritime and Extreme Environment Security (CIMES) researchers helped the USCG Healy escort the Russian fuel tanker to Nome, Alaska, by tracking sea ice conditions.

The Center for Visualization and Data Analytics (CVADA), co-led by Rutgers University and Purdue University, develops new methods and technologies to enable local, state, and federal homeland security agencies to manage and analyze large amounts of complex data.

In FY 2011:

- The Visual Analytics for Command, Control, and Interoperability Environments (VACCINE) Coast Guard Search and Rescue Visual Analytics (cgSARVA) project was awarded the Commander Atlantic-Area's Excellence Coin for its work with Coast Guard District One and District Nine to improve both risk assessment and operational efficiency.



Special Projects Office

In FY 2011, the Special Projects Office transitioned from Homeland Security Advanced Research Projects Agency (HSARPA) to RDP and increased its focus on partnering with the Intelligence Community to identify emerging technologies of interest and leverage relationships with the overall HSE and its components. The Special Projects Office is involved with the National Intelligence Science and Technology Committee, Senior Executive Bio-Intelligence Briefing Series, Mission Executive Council, S&T Intelligence Committee, S&T Leadership Council, Joint Planning and Development Office, Homeland Air Surveillance Integrated Product Team, and Remote Sensing Board.

Key projects included:

- Plant Pathogens Project
- Radio Frequency Identification Project
- Global Futures Forum Initiative
- Wind Turbine Radar Modeling Tool



Active SBIR at a Glance

Phase I Projects

- A Machine Learning Approach to Assessment of Image Quality Through Prediction of Iris Recognition Success
- A Novel Fractionation and Concentration System for Preparation Improved Biological Detection
- Acoustic Vector Sensor
- Automated Flash Memory Analysis
- Automated Tool for Assessing Usability in Systems (A-TAUS)
- Canine Training Aids for HMTD Detection
- Context-Sensitive Situational Awareness Server/Client
- Creating a Pragmatic Plan to Deploy and Evolve an LTE Centric Mission Critical Mobile Voice System
- Deploying Less of More: Leveraging the Long Tail of Distribution
- Detector for Smuggled Currency
- Development of a Standard-based Iris Image Quality Tool Suite
- Development of Liquid-Polymer Grafted Wipes for Improved Surface Sampling of Chemical Agents
- Distributed, Closed-loop, Anonymized, Dynamic Collaborative Defense Against Network Threats
- Dynamic Information Environment for Coordinated Attribution of Symbol Traits (DIE-CAST)
- Electrospray Based High Vacuum Diffusion Pump for Mass Spectrometers
- Electrospray Stand-off Detection of Trace Species in Air of Currency
- Global PSAP
- Handheld Multisensor Wand for the Detection of Threat or Illicit Objects on Persons
- Helmet Embedded Conformal Augmented Display
- Helmet With Embedded Display for Emergency Responders

- Highly Absorptive Nanostructured Chemical Wipe
- Identification of Test Materials and Test Plan for Improved Self-Contained Breathing Apparatus Face Piece Lenses
- Improved Firefighter Face Piece Lenses for Self-Contained Breathing Apparatus
- Improved Wipes for Surface Sampling of Chemical Agents on Porous Materials
- Inexpensive Low Maintenance Long Life Vacuum Pumping System for Hand-held Mass Spectrometers
- Iris Image Quality Tool Suite for Biometric Recognition
- Leveraging Innovative Rapid System Development Practices to Facilitate Effective Technology Deployment for First Responders
- Low-power Tri-axial Acoustic Sensor
- Membrane Cascade for Environmental Sample Separation and Concentration
- Methods to Unlock PIN/PUK Codes from SIM Cards
- Miniature, Rugged Vacuum System for Portable Mass Spectrometers
- Mitigation of Contact Lens, Eye Surgery, Pupil Dilation, and other Challenges on Iris Recognition (three projects)
- Monolithic Electronically Tunable M/LWIR Laser Source
- Monolithic Widely Tunable Quantum Cascade Laser
- Monolithic, Electronically and Widely Tunable Quantum Cascade Laser Sources
- Multispectral Omnidirectional Small Vessel Identification Imaging and Tracking Camera System
- Multistage Dielectrophoretic Sample Preparation System
- NAND/NOR Chip Forensics
- Natural Language Processing and Prioritization for Contextual Symbolic Rendering
- Non-Cooperative Vessel Imaging and Tracking (NVIT)
- Non-Detonable, Non-Hazardous, Low-Cost, Hexamethylene Triperoxide Diamine (HMTD) Training Aids for Canines
- Personal Situational Awareness APP
- PICS: Peer Integrity Checking System
- Portable Ultra High-Resolution Millimeter-Wave Inverse Synthetic Aperture Radar for Close-Range Detection of Concealed Objects
- Public Safety Voice Service Solution for Broadband Wireless Infrastructure and Handsets
- PULSE Portable Usability Lab for System Evaluation
- Scanning Eye-safe UV Raman Explosives Detection System
- SORN-S – Self Organizing Resilient Network Sensing
- Smart Chart AIS
- Standoff Explosive Particle Spectrometer (SEPS)
- Stand-off Explosives Detection by Photothermal Emission Imaging
- Three Dimensional Acoustic Sensing Unit (3DASU)
- Usability Evaluation and Management System (USEMAN)
- Using Semantic Recommendation, End-User Programming, and an Ecosystem to Radically Shorten DHS Adoption Time
- Visor-Enhanced SCBA Transparent Armor Lens System
- Web-based Intelligent Extraction of Symbolology-based on Contextual Information

Phase II Projects

- 3D Building Visualization Tool for Incident Commanders
- 3WEAVE Fabric/Composite Panels for Blast Protection
- A Novel Peak Detection and Data Fusion Methodology for Multidimensional Chemical Analysis
- A Wearable Battery Cloth
- ActionBuilder™: Automated Scenario/Script Builder for

Active SBIR at a Glance

- Simulation-Based Training Systems
- Aerosol Collection Into Low Analysis Volumes
- Assess Ability to use Eye Tracking and Pupil Dilation to Determine Intent to Deceive
- BioSwimmer Biomimetic in Liquid Inspection System
- Current Event Future Outcome Framework
- Customized STR Typing System for Kinship Analysis
- DHS Centers of Excellence Science Fair Projects
- DiamondBack: Sensor Fusion and Feature-Based Human/Animal Classification for UGS
- Dielectric Relaxation Analyzing Probe
- Differential Synthetic Biometric Sample and Template Generation
- Enhanced Charge Retention and Rate Capability in Lithium-Ion Batteries
- Enterprise Botnet Detection and Mitigation System
- Evidence Preserving Hard Disk Unlocking System
- Framework for Biometric Identification on the Move
- Generation of Bivalent Aptamers With High Affinity and Selectivity of Viruses and Bacteria From Environmental Samples
- Geospatial Underground Tracking Solution (GUTS)
- Global Biometrics Gateway System
- Location-based Service for Federal Identity, Credential & Access Management
- Low-cost 3D Sonar System for Underwater Threat Detection
- Low-cost Underwater Threat Detection System
- Low-cost and Rapid DNA Sequencer for Biometric Applications
- Magnetically Switchable Explosives Vapor Isolator
- Miniature and Reliable Chemical Sensors for Cell Phones
- Mobile Stand-off Secure Wireless Biometrics Screening Device
- Modular Frequency Extenders for Vector Network Analyzers
- Multi-Function Wand Prototype Development
- Multi-Platform Program Analysis
- Network Survivability, Recovery & Reconstitution (NS2R)
- Noise Cancellation for Voice Operated Switch (VOX) Communications
- OBSERVER: Ocular-Based Screening Evaluation and Real-time Verification Examination Remotely
- Precision Information Environment for Collaborative Emergency Support (PIECES)
- Protective Panels for Bridge Supports
- Run Time Tools' Output Integration Framework
- Sampling System for Trace Explosive Particles and Vapors
- Screeners Auto-Diagnostic Adaptive Precision Training (Screen-ADAPT) System
- Secure and Reliable Wireless Communication for Control Systems
- Securing Network Access in Wireless Sensor Networks Supporting Industrial Control System
- Semantic Mesh for Intelligent Sensors
- Smart Sensing and Tracking with Video and Mote Sensor Collaboration
- Software Assurance Analysis and Visual Analytics
- Spray-on Treatments for Critical Infrastructure Protection
- Stand-Off Detection of VBIED and Suicide Bomber Threats
- Tamper-Resistant Stretch Wrap
- Telecommunications Linking System
- The BioSonics UnderWater Acoustic Sentinel (UWACS), a Low Cost Underwater Threat Detection
- Use of X-ray Backscatter Imaging to Screen General Aviation Aircraft
- Utility of Next Generation Sequencing Data for Rare Variant Detection and Identification in a Bacterial Sample
- Wearable Thermoelectric Generators for First Responders
- Wide-Area Infrared Imaging (WAIRI) System for Person-in-Water Detection
- Wireless Intelligent Sensor Platform for Emergency Responders (WISPER)

Phase III Projects

- Acoustic Classification Capability for Target Discrimination
- Chem-Tag: Chemical Detection and Alert Badges for First Responders
- Extended STR Typing System for KinSHIP Analysis
- Instantaneous Remote Sensing Data Receiving and Processing for Emergency Response
- Law Enforcement and Intelligence Sensor Fusion: Federal Air Marshal Service Analytic Innovation
- Mobile ELISA-Based Pathogen Detection System (MEPAD)
- Mobile Sensor System Imager Upgrade and Demonstration, Field Support and Testing at a Southwest Border Location
- Mobile Sensor System Radar Upgrade and Demonstration, Field Support and Testing at a Southwest Border Location
- Pilot Tests/Comms Support/In-Bond Shipping/Certifications and Standards
- Secure Parcel ISO Distributed Enhanced RFID (SPIDER)
- Southern Border Video Surveillance System
- Stand-Off Detection of VBIED and Suicide Bomber Threats
- Support to the DHS Knowledge Frameworks Program: Geospatial Analytic Training and Transition



IV. Moving Forward in Uncertain Times



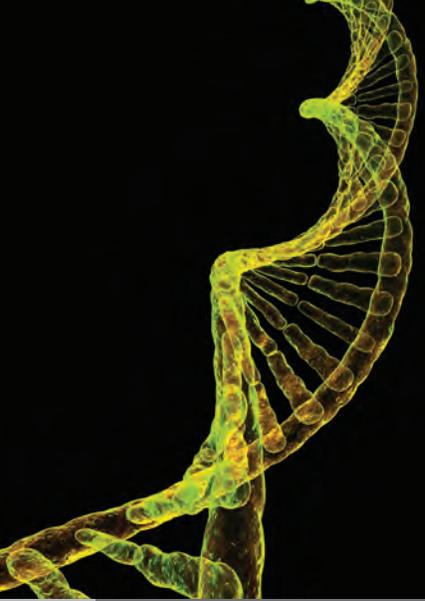
Taking S&T to the Next Level

Moving forward, S&T will continue to support and fight for the needs of its stakeholders, doing productive work with the resources available. S&T will continue to work hand-in-hand with partners to provide innovative, systems-based solutions to complex homeland security challenges, and to evolve the nation's understanding of current and future homeland security risks and opportunities. With a realigned structure that revised the processes by which work was chosen and pursued, S&T is ensuring it can provide the technological capabilities and knowledge products that its partners need. S&T will leverage the solutions developed by other federal agencies and laboratories; state, local, and tribal governments; universities; and the private sector, together with the diverse expertise within S&T and the research community, to enhance the nation's readiness and security.

S&T will focus its resources on fewer projects with higher technology-readiness levels—items that are ready for application by their intended users. In doing so, S&T will cut down on the number of technologies in the pipeline and invest limited funds more strategically. Additionally, S&T will work closely with the first responder community to identify its needs and priorities, and help bring innovation and new technologies to the field. S&T's plan will undergo periodic revisions to ensure it adapts to new circumstances while remaining on track to achieve desired outcomes given available resources.

“On the 10th anniversary of the 9-11 attacks, the 8th anniversary of the creation of the department, and the 6th anniversary of the catastrophic levee failures which caused horrific destruction in and around the city of New Orleans, [caused by] the hurricanes of Katrina and Rita along the Gulf Coast, we must not let our guard down. We must remember the lessons of those horrific events. We must have the fortitude and the discipline and tenacity to continue to fund adequately this effort and not become lax or distracted.”

— *Senate Homeland Security Committee Member
Sen. Mary L. Landrieu (D-LA)*



V. Appendixes



Appendix A: Centers of Excellence (COEs) by State

Centers of Excellence, Partners and Labs | January 2012

*= Minority Serving Institution

Alabama

- Alabama A&M University* – ZADD
- Tuskegee University* – C2I; NCFPD; ZADD

Alaska

- University of Alaska, Fairbanks – MIREES

Arizona

- Arizona State University – NCBSI
- Northern Arizona University – CAMRA
- University of Arizona (**co-lead institution**) – NCBSI; CAMRA

Arkansas

- Arkansas State University, Beebe – ZADD
- Cooperative Extension – ZADD
- University of Arkansas (**co-lead institution**) – NTSCOE; START
- University of Arkansas, Pine Bluff* – ZADD

California

- California Institute of Technology – ALERT
- California Polytechnic State University – CHC
- California State University, Long Beach – CREATE
- California State University, Los Angeles* – CREATE
- Claremont McKenna College – CREATE
- Cooperative Extension – ZADD
- Decision Insights Inc. – NCFPD
- Geosemble Technologies – C2I
- GenVault – ZADD
- Information Sciences Institute (USC) – C2I
- Monterey Institute of International Studies – START
- RAND Corporation – NCBSI
- San Diego State University* – START; NCBSI
- San Jose State University (**co-lead institution**) – NTSCOE
- Stanford University – C2I; CREATE; START
- University of California, Berkeley – CAMRA
- University of California, Davis – ZADD
- University of California, Irvine – CREATE; NCBSI; START
- University of California, Los Angeles – CREATE; PACER; START; ZADD
- University of California, San Diego – CREATE

- University of Southern California (**lead institution**) – CREATE; C2I; NCBSI; ZADD

Colorado

- Colorado Department. of Agriculture – ZADD
- Cooperative Extension – ZADD
- University of Colorado – START

Connecticut

- Artelis – ZADD
- University of Connecticut (**co-lead institution**) – NTSCOE; CHC; NCBSI
- University of New Haven – START
- Wesleyan University – START

Delaware

- University of Delaware – CHC

District of Columbia

- American Medical Association – PACER
- American University – START
- Brookings Institution – PACER
- Catholic University – START
- George Washington University – PACER
- Georgetown University – CREATE; ZADD
- Howard University* – C2I; CREATE; PACER
- Migration Policy Institute – NCBSI
- U.S. Department of Agriculture, National Institute of Food and Agriculture – ZADD

Florida

- Florida A&M University* – ZADD
- Florida International University* – ALERT; C2I
- University of Florida – ZADD
- University of Miami – MIREES
- University of North Florida – START

Georgia

- Cooperative Extension - ZADD
- Fort Valley State University* – ZADD
- Georgia Department of Agriculture – ZADD
- Georgia Institute of Technology – C2I; NCFPD
- Georgia State University – CHC
- Merial – ZADD

Appendix A: COEs by State

- Morehouse College* – ALERT; START
- Morehouse School of Medicine – PACER
- Spelman College* – ALERT
- University of Georgia – ZADD

Hawaii

- University of Hawaii (**co-lead institution**) – MIREES; PACER

Idaho

- Cooperative Extension – ZADD
- Idaho Department of Agriculture – ZADD

Illinois

- Illinois Institute of Technology – NCFPD
- Institute of Food Technologists – NCFPD
- University of Chicago – PACER
- University of Illinois – ALERT
- University of Illinois, Urbana-Champaign – C2I

Indiana

- Indiana University School of Medicine – C2I
- Purdue University (**co-lead institution**) – C2I; ALERT; START
- University of Notre Dame – ALERT

Iowa

- Iowa State University – ZADD

Kansas

- Arthropod-Borne Animal Disease Research Unit – ZADD
- Cooperative Extension – ZADD
- Haskell Indian Nations University* – CREATE
- Kansas Bioscience Authority – ZADD
- Kansas State University (**lead institution**) – ZADD; NCFPD

Kentucky

- Cooperative Extension – ZADD
- Kentucky State University* – NCFPD; ZADD
- University of Kentucky – NCFPD; ZADD

Louisiana

- Extension Disaster Education Network (EDEN) – ZADD
- Louisiana State University – CHC
- Tulane University – CHC

Maine

- Lohmann Animal Health – ZADD
- University of Maine – ZADD

Maryland

- Akonni Biosystems – ZADD
- Cooperative Extension – ZADD
- GenVec – ZADD
- John Hopkins University (**lead institution**) – PACER
- Morgan State University* – C2I
- Qiagen – ZADD
- Regal Decision Systems – C2I
- University of Maryland (**lead institution**) – START; CREATE

Massachusetts

- Boston University – ALERT
- Brandeis University – START
- Fisher Scientific – ZADD
- Massachusetts General Hospital – ALERT
- Massachusetts Institute of Technology – MIREES; START
- Northeastern University (**co-lead institution**) – ALERT
- Tufts University – ALERT; START
- University of Massachusetts, Lowell – C2I
- Wellesley College – START
- Woods Hole Oceanographic Institution – ALERT

Michigan

- Cooperative Extension – ZADD
- Eastern Michigan University – START
- Michigan Department of Agriculture – ZADD
- Michigan State University (**lead institution**) – CAMRA; START; ZADD
- University of Michigan – CAMRA
- Wayne State University – NCFPD

Minnesota

- Cooperative Extension – ZADD
- Midwest Veterinary Supply – ZADD
- University of Minnesota (**lead institution**) – NCFPD; NCBSI; START; ZADD

Mississippi

- Alcorn State University* – CHC
- Cooperative Extension – ZADD
- Jackson State University* (**co-lead institution**) – CHC
- Mississippi Department of Agriculture and Commerce – ZADD
- Mississippi State University – CHC
- Mississippi Valley State University* – CHC

Appendix A: COEs by State

- Tougaloo College* (**co-lead institution**) – **NTSCOE**; CHC
- University of Southern Mississippi – NCFPD
- USACE Engineer Research and Development Center – CHC

Missouri

- Boehringer Ingelheim Vetmedica Inc. – ZADD
- Cooperative Extension – ZADD
- Missouri University of Science and Technology – ALERT
- Synbiotics – ZADD
- University of Missouri, Columbia – NCFPD; ZADD
- University of Missouri, Kansas City – START

Nebraska

- University of Nebraska at Omaha – NCBSI

New Hampshire

- Dartmouth College – NCBSI
- Dartmouth Medical School – START

New Jersey

- Alcatel-Lucent Bell Labs – C2I
- AT&T Labs-Research – C2I
- Cooperative Extension – ZADD
- Monmouth University – MIREES
- New Jersey Dept. of Agriculture – ZADD
- Port Authority of New York and New Jersey – MIREES
- Princeton University – C2I; CREATE
- Rutgers University (**co-lead institution**) – **C2I**; **NTSCOE**; MIREES; NCFPD; START
- Stevens Institute of Technology (**co-lead institution**) – **MIREES**
- Telcordia Technologies – C2I
- University of Medicine and Dentistry of New Jersey – C2I

New Mexico

- Navajo Technical College* – C2I
- New Mexico Consortium – NCFPD
- New Mexico Institute of Mining and Technology* – NCBSI
- New Mexico State University* – ALERT; NCBSI; NCFPD; ZADD
- New Mexico Swansea University – C2I
- University of New Mexico* – NCBSI; START

New York

- City College of New York* – C2I
- Columbia University – ZADD

- Cornell University – CREATE; NCFPD; ZADD
- Integrated Nano-Technologies – ZADD
- John Jay College, CUNY* – START
- Long Island University (**co-lead institution**) – **NTSCOE**
- Mt. Sinai School of Medicine – ZADD
- New York Department of Agriculture – ZADD
- New York University – CREATE
- Orion Integrated Biosciences – ZADD
- Plum Island Animal Disease Center – ZADD
- Rensselaer Polytechnic Institute – ALERT; C2I; CHC
- SUNY, Buffalo – CREATE
- SUNY, Purchase – START
- University at Albany, SUNY – START
- U.S. Army Corps of Engineers Field Research Facility – CHC

North Carolina

- Cooperative Extension - ZADD
- Johnson C. Smith University* – CHC
- North Carolina A&T State University* – ZADD
- North Carolina Department of Agriculture – ZADD
- North Carolina Farm Bureau – ZADD
- North Carolina State University – CHC
- Research Triangle Institute International – NCBSI
- Smithfield Premium Genetics Group – ZADD
- University of North Carolina, Chapel Hill (**co-lead institution**) – **CHC**
- University of North Carolina, Charlotte – CHC; C2I

North Dakota

- North Dakota State University – NCFPD

Ohio

- North American Deer Farmers Association – ZADD
- Ohio State University – START

Oklahoma

- University of Oklahoma – CHC; START
- University of Oklahoma, Health Sciences Center – START

Pennsylvania

- Bryn Mawr College – START
- Carnegie-Mellon University – C2I; CAMRA
- Drexel University – CAMRA
- Hemispherx Biopharma Inc. – ZADD
- King's College – START
- Penn State University – C2I; NCBSI; START

Appendix A: COEs by State

- Pennsylvania School of Veterinary Medicine – ZADD
- University of Pennsylvania – CREATE; START
- University of Pittsburgh, Center for Biosecurity – PACER
- University of Pittsburgh Medical Center – START

Rhode Island

- University of Rhode Island (**co-lead institution**) – **ALERT**

South Carolina

- Medical University of South Carolina – CHC
- South Carolina State University* – CHC
- University of South Carolina – START

South Dakota

- South Dakota State University – ZADD

Tennessee

- Meharry Medical College – PACER
- St. Jude Children's Research Hospital – ZADD
- Tennessee State University* – ZADD
- University of Tennessee – PACER; NCFPD
- Vanderbilt University – CREATE
- Vanderbilt University Medical Center – PACER

Texas

- AgriLife Extension – ZADD
- Agrilife Research – ZADD
- Bio Scientific Corp. – ZADD
- Center for Career and Technology Education – NCBSI
- Rice University – CHC
- Sam Houston State University – ZADD
- Texas A&M College of Veterinary Medicine – ZADD
- Texas A&M University, College Station (**lead institution**) – ZADD; NCFPD
- Texas Animal Health Commission – ZADD
- Texas Engineering Experiment Station – ZADD
- Texas Southern University* (**lead institution**) – **NTSCOE**; C2I; CHC
- Texas Tech University – ALERT
- Texas Veterinary Medical Diagnostic Laboratory – ZADD
- University of Houston – C2I; CHC
- University of Houston, Downtown* – C2I
- University of Texas, Austin – C2I; START
- University of Texas, Dallas – CHC; CREATE

- University of Texas, El Paso* (**co-lead institution**) – **NCBSI**

- University of Texas, Medical Branch – ZADD
- University of Texas, Pan American* – NCBSI

Vermont

- Cooperative Extension – ZADD
- Vermont Agency of Agriculture – ZADD

Virginia

- American Indian Higher Education Consortium – PACER
- AT&T Labs-Research – C2I
- Ceres Nanosciences – ZADD
- George Mason University – ZADD
- MITRE Corporation – PACER
- Old Dominion University – NCFPD; ZADD
- University of Virginia – CREATE
- Virginia Tech University – C2I; ZADD

Washington

- University of Washington – C2I; NCFPD; ZADD
- VMRD Inc – ZADD
- Washington State University, Pullman – ALERT

West Virginia

- West Virginia University – NCBSI

Wisconsin

- University of Wisconsin, Madison – CREATE; NCFPD; START

Wyoming

- University of Wyoming – ZADD

Appendix B: COE International Partners and Labs

*= Minority Serving Institution

Australia

- Monash University – CREATE

Canada

- Carleton University – C2I
- Dalhousie University – C2I
- University of Manitoba – C2I
- University of Ontario Institute of Technology – C2I
- University of Victoria – C2I
- University of Calgary – C2I
- Risk Sciences International – NCFPD
- Simon Fraser University – C2I
- University of British Columbia – C2I
- University of Guelph – NCFPD

Finland

- Laurea University of Applied Sciences – NCBSI; MIREES

Germany

- Freie Universität Berlin – ZADD
- Labor Diagnostik Leipzig – ZADD
- University of Stuttgart – C2I

Israel

- Bar Ilan University – START
- Ben-Gurion University – ALERT
- Hebrew University, Jerusalem – ALERT
- Weizmann Institute – ALERT

Italy

- European University Institute – START

Macedonia

- University of Macedonia, START

Netherlands

- TNO, Netherlands – CREATE

New Zealand

- Fonterra – NCFPD
- Massey University – CHC

Puerto Rico

- University of Puerto Rico*, Mayaguez – ALERT; CREATE; MIREES
- University of Puerto Rico, Ponce – ZADD

Singapore

- Nanyang Technological University – START

Switzerland

- Prionics – ZADD

United Kingdom

- Middlesex University, England – C2I
- Oxford University, Wales – C2I
- United Kingdom, Institute for Animal Health (Pirbright) – ZADD
- St. Andrews University – START
- University of Surrey – START
- Swansea University – C2I

Appendix C: Full Proposal Titles Submitted to 2011 Long-Range Broad Agency Announcement Office

- Gaming Systems Monitoring and Analysis Project
- Collegiate Cyber Defense Competition, CyberPatriot, and Cyber Cup Support
- Mobile Geospatial Situational Awareness for Field and Command Staff During the Emergency Response Phase
- Development of Northrop Grumman Viable Bioaerosol Collector (NG-VBC) Prototypes
- Novel X-Ray Differential Phase-Contrast Tomography Methods for Aviation Security/Explosives Detection
- Infrastructure Protection and Disaster Management
- Wireless Health Monitoring and Location Tracking Rapid Product Development Center
- Automated Behavior-based Screening and Anomaly Detection Technology
- Diagnostic Countermeasures for Biological Threats
- Hyperspecific Monoclonal Antibodies for Pathogen Detection
- Video for Behavior Detection Officers
- U.S. Cyber Challenge
- Evaluation/Enhancement of the GOES Early Fire Detection (GOES-EFD) System Supporting First Responders
- A Device for Automatic Color Correction in EMS Video Communications
- Tracking Airborne and Satellite Remote Sensing Collection Assets for Emergency Response Phase
- DHS BAA Pictometry RAMS LiDAR Response
- Panoply Network Security Competition
- SSMT Security System for Mass Transit (EXD.01-0012-1)
- SSMT Security System for Mass Transit (EXD.04-0002-1)
- Interfacing Visual Analytics With Network Security Data Sources
- Using DHS Risk Assessments to Inform Resource Decision Making
- Label-free, Electrical Single Molecule Detection of Pathogenic DNA in a Nanofluidic Structure
- Automatic Software Model Repair for Security Policies
- Virtual Environment & Visualization Support to National Level Exercise 2012
- Validation of Sample Processing and Analysis for Microbial Forensics
- Secure Authentication and Entitlement Using Formal Methods and Separation Kernels
- Early Detection of Adverse Events
- Enhancement of First Responder Decision Making/ Action Capability Through Improved Information Sharing by Leveraging Existing Modeling and Simulation for Disaster Threat and Mitigation and S&T Investments
- Development of an Automatic Solid Extraction Platform for Sample Pre-Treatment of Complex Sample Matrices for Detection of Biothreat Agents
- Construction and Evaluation of Recombinant MVA-BN Foot and Mouth Disease Vaccine Candidates
- Methodology & Technology to Manage System Requirements for DHS S&T Programs
- Disease in Motion: Integrating Epidemic and Social Dynamics in the Control of Infectious Agents
- The Prediction and Containment of Livestock Diseases With Spatio-Temporal Network Modeling
- An Examination of Model Complexity for Within-Farm Assessment of Potential Epidemics in Livestock Populations
- Method and System for Increased Indoor Position Tracking Accuracy in GPS-denied Areas
- An Integrated Approach to Geo-Target At-Risk Communities and Deploy Effective Crisis Communication Approaches
- Effects of Reconstruction Algorithms on Key Detection Parameters in the Presence of Clutter
- Development of Infrastructure and Procedures for Evaluating Earthquake Forecasts and Predictions
- Resource Deployment System (RDS) Extension to New Multi-Modal Transportation Security Responsibilities of the Federal Air Marshal Service

Appendix D: International Cooperative Programs Office Active Grant Projects

- Genomic Sequencing and Signature Identification in Clostridium Botulinum Strains from Argentina, Northern Arizona University (Flagstaff)
- Smart Monitoring of Complex Public Scenes, University of Nevada at Reno
- Biometric Uniqueness and Permanence Analysis, Purdue University (West Lafayette, Ind.)
- Development and Full-Scale Testing of Early Detection Tools for Flood-Control Infrastructure, Rensselaer Polytechnic Institute (Troy, NY)
- Technology and Data Integration for Bioforensics, Northern Arizona University (Flagstaff)
- Keeping Our Structures Standing and Our People Alive: The Next 25 Years, The University of Texas at Austin
- High Strain Rate Behavior of Dam Concrete: Experiments and Multiscale Modeling, Rensselaer Polytechnic Institute (Troy, NY), Northwestern University (Chicago, Ill.)
- Spread of Animal Disease Within U.S. Livestock: Improving Decisions and Interventions, Colorado State University (Fort Collins)
- Radio Frequency Identification (RFID) Systems For Small Vessel Maritime Security, University of Houston (Houston, Texas)

“Through international collaboration, we not only enhance our ability to prevent terrorism and transnational crime, we also leverage the resources of our international partners to more efficiently and cost-effectively secure global trade and travel. Today, DHS works in more than 75 different countries—the third largest foreign footprint of any civilian U.S. government agency—in order to address and respond to evolving threats before they reach our shores.”

— *DHS Secretary Janet Napolitano*

Appendix E: Office of Safety Act Implementation (OSAI) / SAFETY Act Projects FY 2011

SAFETY Act Designations and Certifications

Northrop Grumman Systems Corporation

September 27, 2011 – Northrop Grumman Systems Corporation provides anti-terrorism Integrated Security Services (ISS). The Technology comprises a suite of services for assessing security needs, developing systems architecture (including infrastructure modifications), and combining the necessary sensors, communications networks, and operations center systems to provide an anti-terrorism security capability. The Technology also includes training, post-installation maintenance, and the qualified personnel who perform these services. This renewed Designation and Certification will expire on October 31, 2016.

BlastGard® International Inc.

September 13, 2011 – BlastGard® International Inc. provides BlastWrap®. The Technology can be deployed to mitigate (i.e., contain) the effects of an explosion or as a protective layer to absorb energy and possibly protect assets from damage caused by an external explosion. This renewed Designation and Certification will expire on October 31, 2016.

E-Z-EM Inc.

August 30, 2011 – E-Z-EM Inc. provides Reactive Skin Decontamination Lotion (RSDL). The Technology is a topical lotion used to neutralize and/or remove chemical weapon, blister, or T-2 agents that have come in contact with the skin. The Technology also includes individual sealed applicators impregnated with the lotion and instructions for proper use. This renewed Designation and Certification will expire on September 30, 2016.

ASIS International

August 29, 2011 – ASIS International, a not-for-profit professional association incorporated in Delaware and an American National Standards Institute Accredited Standards Development Organization has developed DHS National Standards. The Technology is a DHS National Standard, ASIS SPC.1-2009, “Organizational Resilience: Security, Preparedness and Continuity Management Systems – Requirements with Guidance for Use.” The standard(s) have been reviewed, formally adopted, and encouraged for promulgation by the Department of Homeland Security (“DHS”) according to the procedures set forth by the DHS National Standards Program and the DHS Standards Council. This Designation and Certification will expire on September 30, 2016.

Mistral Security Inc.

August 26, 2011 – Mistral Security Inc. provides its Blast Containment Receptacles, which are trash receptacles

designed to absorb the blast energy and resist fragments of an explosive device concealed within the receptacle (the “Technology”). This renewed Designation and Certification will expire on September 30, 2016.

Cepheid Inc.

August 16, 2011 – Cepheid Inc. provides GeneXpert®. The Technology is an anthrax identification system, which uses a polymerase chain reaction (PCR) to amplify the genes of a given sample. The systems self contained cartridges house the PCR reagents and protect the user from cross contamination. The Technology also includes installation, maintenance, and operator training, as outlined in Cepheid Inc.’s GeneXpert® Field System Operator Manual. This renewed Designation and Certification will expire on September 30, 2016.

Emergent BioDefense Operations Lansing LLC

August 09, 2011 – Emergent BioDefense Operations Lansing LLC provides BioThrax®. The Technology is a sterile liquid suspension made from cell-free filtrates of microaerophilic cultures of an avirulent, nonencapsulated strain of *Bacillus anthracis*. The Technology is U.S. Food and Drug Administration (FDA)-licensed for active immunization of individuals between 18 and 65 years of age to prevent disease caused by *B. anthracis*. The Technology is to be administered and used in a manner consistent with its FDA licensing as a pre-exposure prophylaxis or as directed by the U.S. government as a post-exposure prophylaxis. The Technology also includes manufacturing, testing, labeling, packaging, and storage of BioThrax®, as well as the associated technical documents and manuals. This renewed Designation and Certification will expire on September 30, 2016.

Northrop Grumman Security Systems LLC

July 29, 2011 – Northrop Grumman Security Systems LLC provides the Biological Detection System. The Technology is a biological pathogen point detection system that is configured to screen for the presence of *Bacillus anthracis* in mailrooms. The Technology also includes training and maintenance. This renewed Designation and Certification will expire on August 31, 2016.

Raytheon Company

July 27, 2011 – Raytheon Company provides Screening Partnership Program Services. The Technology consists of the provision of trained and skilled personnel to operate screening equipment, conduct pre-board passenger screening, and carry-on and checked luggage and accessible property screening to prevent prohibited items from entering the sterile area of an

Appendix E: OSAI / SAFETY Act Projects FY 2011

airport. This renewed Designation and Certification will expire on August 31, 2016.

Rapiscan Systems Inc.

July 27, 2011 – Rapiscan Systems Inc. provides Metal Detection Systems. The Technology is a line of non-intrusive metal detection systems that can be used to screen for weapons and explosives with metal components. The Technology also includes installation, integration, maintenance, training, a warranty, personnel qualifications, and all technical manuals. This renewed Designation and Certification will expire on August 31, 2016.

Prepared Response Inc.

July 21, 2011 – Prepared Response Inc. provides the Rapid Responder. The Technology is a web-based application that provides access to critical facility information enabling authorized first responders and managers to view pre-determined tactical response plans while responding to an emergency and assist in the coordination of an on-site response to emergency incidents. The Technology includes training and maintenance services. This renewed Designation and Certification will expire on August 31, 2016.

Hach Company

June 29, 2011 – Hach Company provides the Hach Guardian Blue™. The Technology is a system of monitoring systems designed to monitor drinking water networks and alarm in the event that threat agents or other contaminants are introduced. The Technology also includes site assessments, site preparation, installation, manuals, operator training, and service and maintenance programs. This renewed Designation and Certification will expire on July 31, 2016.

Kenton County Airport Board

June 28, 2011 – Kenton County Airport Board provides Cincinnati/Northern Kentucky Airport (CVG) Airport Security Management Plan. The Technology is the development and implementation of its Transportation Security Administration (TSA)–Approved Airport Security Management Plan, which includes physical and electronic security measures, tools, and procedures. The Technology also includes the operations and training of airport police, security, and rescue and firefighting personnel; operations of the airport Emergency Operations Center; selection and integration of technical physical and technical security systems and procedures; airport security plans and planning documentation; and, the maintenance of physical and technical security

measures. This Designation and Certification will expire on July 31, 2016.

Alluviam LLC provides HazMasterG3®

June 23, 2011 – Alluviam LLC provides HazMasterG3®. The Technology is decision-support software for responding to Acts of Terrorism or other incidents involving chemical, biological, radiological, nuclear, and/or explosives, Homemade Explosives, or other hazardous materials. The Technology includes product documentation and periodic updates to the software and associated databases. This renewed Designation and Certification will expire on July 31, 2016.

Lockheed Martin Corporation

June 16, 2011 – Lockheed Martin Corporation provides Specialized Security Training Services. The Technology is a customized suite of training services and program support designed to train airport security personnel in the screening of persons and packages for TSA Contract HSTS01-09-D-OSO900. The Technology also includes support services, documentation, etc. This renewed Designation and Certification will expire on July 31, 2016.

Garrett Electronics Inc. (d/b/a Garrett Metal Detectors)

June 13, 2011 – Garrett Electronics Inc. (d/b/a Garrett Metal Detectors) provides Walk-through Metal Detectors. The Technology is a line of walk-through metal detectors and includes the following model: PD-6500i. The Technology uses low frequency electromagnetic fields and makes detections by measuring disturbances in those fields due to the presence of conductive metal. The Technology responds with visual and/or audible alarm warnings when detections are made. The Technology consists of three main subsystems: a detection unit (electronics), transmit and receive side panels, and auxiliary components. Included in the Technology are the Technology-related user manuals. This Designation and Certification will expire on July 31, 2016.

Ameristar Fence Products Inc.

June 07, 2011 – Ameristar Fence Products Inc. provides the Stalwart Anti-Ram Passive Cable Barrier. The Technology is a passive vehicle barrier intended to create safe stand-off distance around protected areas or facilities. The Technology is applicable to government and commercial facilities. The Technology also includes guidance with atypical site conditions; guidance with the selection of a specific Ameristar Stalwart cable barrier system

Appendix E: OSAI / SAFETY Act Projects FY 2011

SAFETY Act Designations and Certifications

variant that meets the customer's penetration resistance and stand-off distance requirements; and recommendations of experienced installers. This Designation and Certification will expire on June 30, 2016.

Ameristar Fence Products Inc.

June 07, 2011 – Ameristar Fence Products Inc. provides the Impasse High Security Pale Fence. The Technology is high security fencing intended to deter, delay, and/or prevent intruders from gaining access to an asset or from launching attacks from the area immediately outside a facility's perimeter. The Technology also includes Technology-related accessories such as privacy slats, intrusion detection system clips, rail covers, and barbwire arms; recommendations of qualified installers, a warranty; and guidelines for maintaining the Technology. This Designation and Certification will expire on June 30, 2016.

OSI Systems Inc. and Rapiscan Systems Inc.

June 07, 2011 – OSI Systems Inc. and Rapiscan Systems Inc. provides Rapiscan Conventional X-ray Systems. The Technology consists of units in the 500 and 600 Model Lines (515, 520B, 522B, 618XR, 620DV, 620XR, 622XR, 624XR, 626XR, 627DV, 627XR, 628DV, 628XR, 632DV, 636SV, 638DV, and 638XR). The non-intrusive systems use ionizing radiation, software, and hardware to produce density-based images for the operator in which shapes and material types are outlined and is designed to be effective against incendiary weapons or explosive devices. The Technology also includes operation and maintenance training, system installation and integration, preventative maintenance, warranty services, manuals, image interpretation aids, peripherals, and upgrades. This renewed Designation and Certification will expire on June 30, 2016.

Universal Protection Service

June 03, 2011 – Universal Protection Service provides Security and Guard Services. The Technology is physical security services for commercial buildings designed to deter, prevent, detect, alert, and respond to a variety of security threats. The Technology also includes unarmed security officers, fire/life safety, security assessments, security training, and emergency preparedness services and the recruitment, vetting, hiring, and training of its personnel which perform these services. This Designation and Certification will expire on January 31, 2015.

Genetec Inc.

April 11, 2011 – Genetec Inc. provides Omnicast. The Technology is a Windows-based secure IP Video Surveillance Software that provides seamless

management of video, audio, and data across any IP network through plug-ins. The Technology also includes training and internal certification of resellers, custom software services, user manuals, and help desk services. This Designation and Certification will expire on May 31, 2016.

T&M Protection Resources L.L.C.

April 08, 2011 – Protection Resources L.L.C., a Delaware Limited Liability Company, provides Explosive Detection Canine Services ("the Technology"), which consists of a trained and certified chemical detector canine, together with a trained and certified human canine "handler," for the focused purpose of detecting the presence of a defined group of common explosives and constituent odor signature chemicals that could be used in a terrorist attack. Guided by their handlers, the canines are used to screen packages, vehicles, venues, special events, and customer locations for conventional explosives and improvised explosive devices. This Designation and Certification will expire on May 31, 2016.

FirstLine Transportation Security Inc.

April 01, 2011 – FirstLine Transportation Security Inc. provides Airline Passenger and Baggage Screening Services. The Technology consists of the provision of trained and skilled personnel to operate screening equipment, conduct pre-board passenger screening, and carry-on and checked luggage and accessible property screening to prevent prohibited items from entering the sterile area of an airport. This Designation and Certification will expire on May 31, 2015.

The Sherwin-Williams Company

March 10, 2011 – The Sherwin-Williams Company provides Blast Mitigating Composite Panels (BMCP). The Technology is a line of fiber-reinforced or non-fiber-reinforced polymer panels designed to mitigate the damage caused from projectile strikes or explosions. The Technology also includes sales and installation services. This renewed Designation and Certification will expire on March 31, 2016.

SAFRAN USA Inc. (a wholly owned subsidiary of SAFRAN Group), GE Homeland Protection Inc. (f/k/a GE InVision Inc.), Morpho Detection Inc., and Morpho Detection International Inc.

February 17, 2011 – SAFRAN USA Inc. (a wholly owned subsidiary of SAFRAN Group), GE Homeland Protection Inc. (f/k/a GE InVision Inc.), Morpho Detection Inc., and Morpho Detection International Inc., provide CTX™ Explosives Detection Systems. The Technology is used in screening, for example,

Appendix E: OSAI / SAFETY Act Projects FY 2011

checked airline baggage. It aids in the detection of explosives through the combined use of two types of X-ray images, computed tomography (CT), and proprietary software algorithms. The Technology includes two models: CTX 2500™ and CTX 5500 DS™. Included in the Technology are customized services associated with the Technology's deployment, such as installation, training, maintenance, and technical and logistical support. This renewed Designation and Certification will expire on March 31, 2016.

SAFRAN USA Inc. (a wholly owned subsidiary of SAFRAN Group, a French company), GE Homeland Protection Inc. (f/k/a GE InVision Inc.), Morpho Detection Inc., and Morpho Detection International Inc.

February 17, 2011 – SAFRAN USA Inc. (a wholly owned subsidiary of SAFRAN Group, a French company), GE Homeland Protection Inc. (f/k/a GE InVision Inc.), Morpho Detection Inc., and Morpho Detection International Inc., provide the Itemiser®2, Itemiser®3, and Itemiser® DX. The Technology is desktop trace detectors that enable the detection of microscopic particles of explosives that remain on, for example, clothing, luggage, or ID cards. The Technology's detection system is based on Ion Trap Mobility Spectrometry (ITMS®). Also, the Technology allows for two sampling methods: Surface Wipe Sampling, which uses reusable sample traps that are manually swiped across a surface; and Vacuum Sampling, which uses an optional vacuum sampling unit to draw vapors into a sponge-like sample trap. The Technology is deployed as stand-alone units. Included in the Technology are: the desktop detector unit, consumables and accessories, and user manuals and the procedures defined therein. This renewed Designation and Certification will expire on February 29, 2016.

Securitas Holdings Inc., Securitas Services Inc., Securitas Security Services USA Inc., Securitas Security Systems USA Inc., Pinkerton Consulting & Investigations Inc., Pinkerton Government Services Inc., Pinkerton Government Services of Puerto Rico Inc., Globe Aviation Services Corporation, Securitas Security Services of Puerto Rico Inc.; Securitas Security Services Guam Inc.; Burns International Security Services Company LLC, Burns International Services Company LLC; Pinkerton's LLC; and Renaissance Center Management Company

February 17, 2011 – Securitas Holdings Inc., Securitas Services Inc., Securitas Security Services USA Inc., Securitas Security Systems USA Inc.,

Pinkerton Consulting & Investigations Inc., Pinkerton Government Services Inc., Pinkerton Government Services of Puerto Rico Inc., Globe Aviation Services Corporation, Securitas Security Services of Puerto Rico Inc.; Securitas Security Services Guam Inc.; Burns International Security Services Company LLC, Burns International Services Company LLC; Pinkerton's LLC; and Renaissance Center Management Company provides Security Services. The Technology provides an array of security services including armed and unarmed security officers, access control, ambulatory response, and associated security guard services. The Technology is specific to guards receiving anti-terrorism training. The Technology also includes control through drug testing, background checks, proprietary hiring practices and procedures, training, certification, and recertification standards. This Designation and Certification will expire on October 31, 2015.

Reveal Imaging Technologies Inc.

January 25, 2011 – Reveal Imaging Technologies Inc., and Science Applications International Corporation provide the CT-80 and CT-80DR Explosives Detection Systems (EDSs). The Technology is used to screen items, such as checked airline baggage, for the presence of explosives. It is based on compact, dual-energy computed tomography (CT). Additionally, algorithms used in the Technology software reconstruct an item's contents and analyze the contents for the presence of explosives in an automated manner. SAFETY Act protections apply to models of the Technology that TSA has certified as EDSs. This renewed Designation and Certification will expire on February 29, 2016.

The Turner Corporation

December 16, 2010 – The Turner Corporation and its subsidiaries provide Checked Baggage Screening Services (CBSS Services). The Technology is a set of services that includes the development, installation, and maintenance of checked baggage screening systems at airports. The Technology also includes maintenance training, maintenance manuals, system warranties, maintenance management, and the qualifications of the personnel. This renewed Designation and Certification will expire on January 31, 2016.

Service Source Inc.

December 13, 2010 – Service Source Inc., provides a Mail Processing, Screening, and Distribution Service. The Technology is an integrated set of processes, procedures, equipment, and personnel designed to safeguard facilities, their occupants, and addressees against mail-borne chemical, biological, radiological,

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nuclear, and explosive threats. The Technology includes the receipt, screening, processing, and distribution of incoming mail and parcels. It is deployed in accordance with operational requirements set forth by DHS. Included in the Technology are all manuals and technical documents associated with deployment of the Technology as well as the underlying process. This Designation and Certification will expire on November 30, 2014.

Raytheon Company

October 06, 2010 – Raytheon Company and its wholly owned subsidiary Raytheon Technical Services Company LLC, provide Private Screening Services as part of the TSA Screening Partnership Program (SPP). The Technology consists of trained and certified personnel who conduct passenger, airport employee, and baggage screening in accordance with TSA guidelines and standard operating procedures. The Technology also includes operation, training, and maintenance as related to airport screening equipment. Certification of the Technology is specific to deployment at Key West International Airport (Florida). This Designation and Certification will expire on February 29, 2012.

SAFETY Act Designations

iControl Inc.

September 30, 2011 – iControl Inc. provides the Marine Asset Tag Tracking System (MATTS). The Technology is a family of devices used for tracking and monitoring remote mobile assets. The family consists of the: iTAG, mLOCK, iCHIME, and miKEY. This Designation will expire on October 31, 2016.

MVT Equity LLC

September 30, 2011 – MVT Equity LLC provides the Passive Millimeter Wave Sensor Systems. The Technology is a passive sensor system used for detecting potential threat objects present on individuals passing through an area under surveillance. The Technology also includes an operator's manual. This Designation will expire on October 31, 2016.

L-3 Communications Security and Detection Systems Inc.

September 27, 2011 – L-3 Communications Security and Detection Systems Inc. provides Security X-Ray Inspection and Screening Systems. The Technology is security X-ray inspection and screening system which detects threat objects, to include explosives, weapons, narcotics, and other contraband in baggage and packages. The Technology also includes the training, installation, maintenance, customer service

and support, and technical documents associated with the Technology. This Designation will expire on October 31, 2016.

Summit NW Corp.

September 27, 2011 – Summit NW Corp. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by the TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology will include, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology includes only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on October 31, 2016.

Bluebird Express LLC

September 26, 2011 – Bluebird Express LLC, provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by the TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, and adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on October 31, 2016.

Lockheed Martin Corporation

August 30, 2011 – Lockheed Martin Corporation provides Biological Aerosol Warning System. The Technology is a networked array of single-point sensor nodes that can alert a user to the presence of biological particulates. The Technology also includes: operational and maintenance training; and systems engineering and integration services for the design, development, and deployment of the Technology. This renewed Designation will expire on September 30, 2016.

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Northrop Grumman Systems Corporation

August 29, 2011 – Northrop Grumman Systems Corporation provides Secure Broadband Wireless Communications Infrastructure systems engineering and integration services. The Technology provides design, recommendations, and procures equipment; installs, tests, and fully integrates user-required network and applications into live operating environments. This renewed Designation will expire on September 30, 2016.

Advanced Maritime Transports Inc.

August 09, 2011 – Advanced Maritime Transports Inc., provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, and adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on September 30, 2016.

Locke Funeral Home Inc.

August 09, 2011 – Locke Funeral Home Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology will include, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology includes only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on September 30, 2016.

ASIS International

July 27, 2011 – ASIS International provides ASIS International Certification, a certification process for security personnel, including Certified Protection Professionals, Professional Certified Investigators,

and Physical Security Professionals. This renewed Designation will expire on August 31, 2016.

Hamilton Safe Company and Hamilton Products Group Inc.

July 21, 2011 – Hamilton Safe Company and Hamilton Products Group Inc. provide Hamilton Entrance Control System. The Technology is a security vestibule system designed to prevent or delay access to a facility by individuals with firearms. The Technology also includes installation by Hamilton trained and company certified personnel, operator training for facility personnel, maintenance support, and all applicable system documentation and manuals. This Designation will expire on August 31, 2016.

Lufthansa Cargo A.G.

July 21, 2011 – Lufthansa Cargo A.G. provides Lufthansa Screening and Security Services. The Technology is cargo screening services under TSA programs within the United States and its territories. The Technology also includes training and quality control audits for the TSA cargo screening regulations. This Designation will expire on August 31, 2016.

The Raytheon Company

July 12, 2011 – The Raytheon Company provides the Perimeter Intrusion Detection System. The Technology is a systems-engineering and integration service that is designed to deploy and support systems that detect, assess, track, and facilitate response to perimeter intrusions at ports, airports, sensitive buildings or other customer sites. The Technology may also include the following: program management, system design, subcontractor selection, system integration, system maintenance plans, testing services, training, warranty and maintenance services, and technical manuals. This renewed Designation will expire on August 31, 2016.

Panalpina Inc.

June 29, 2011 – Panalpina Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology will include, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology includes

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only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on July 31, 2016.

MKS Instruments Inc.

June 28, 2011 – MKS Instruments Inc., provides the AIRGARD® Gas Analyzer. The Technology is self-contained system used for continuous monitoring of ambient air in an enclosed area and, if present, detection of chemical threat agents. The Technology also includes Technology-related hardware and software manuals, as well as the procedures defined therein. This Designation will expire on July 31, 2014.

Lockheed Martin Corporation

June 28, 2011 – Lockheed Martin Corporation provides Dry Filter Unit Systems and Services. The Technology is a blower and filter unit which continuously traps airborne particulate matter for customer analysis. This Technology is provided in three configurations: the DFU 1000, the DFU 2000, and the DFU Executive. The Technology also includes consumable supplies, and support services including deployment and installation, sample collection and preparation, field maintenance, and training. This Designation will expire on July 31, 2014.

Composite Technologies LLC, BAE Systems Inc.

June 21, 2011 – Composite Technologies LLC, BAE Systems Inc., and BAE Systems Survivability Systems LLC provide Energy Absorbing Walls. The Technology is a composite assembly of a steel stud frame and an exterior panel of Ultra High Performance Ballistic Concrete which are joined as an integrated structure that provides increased resistance of critical building facades to fire, ballistics, and explosive blasts. The Technology also includes the manufacturing of the different components of the Technology and attendant services related to deployment. This Designation will expire on July 31, 2016.

Composite Technologies LLC, BAE Systems Inc.

June 17, 2011 – Composite Technologies LLC, BAE Systems Inc., and BAE Systems Survivability Systems LLC provide Cable and Piping Shields. The Technology is composed of Ultra High Performance Ballistic Concrete and a non-combustible steel chassis that provide increased resistance of pipelines and bridge suspender ropes/cables to various threats, such as explosive blasts, ballistics, cutting, hammering, and torching. The Technology also includes the manufacturing process and attendant services related to deployment. This Designation will expire on July 31, 2016.

New York Stock Exchange-Euronext

June 14, 2011 – New York Stock Exchange-Euronext provides the New York Stock Exchange Security System. The Technology is composed of command and control and integration of a multi-layered security system and services at a major financial venue. The Technology also includes the integration with supporting government agency programs. This Designation will expire on June 30, 2016.

Garrett Electronics Inc. (d/b/a Garrett Metal Detectors)

June 13, 2011 – Garrett Electronics Inc. (d/b/a Garrett Metal Detectors) provides Walk-through Metal Detectors. The Technology is a line of walk-through metal detectors and includes the following models: CS-5000, MT-5500, MS-3500, and PD-6500i. The Technology uses low-frequency electromagnetic fields and makes detections by measuring disturbances in those fields due to the presence of conductive metal. The Technology responds with visual and/or audible alarm warnings when detections are made. The Technology consists of three main subsystems: a detection unit (electronics), transmit and receive side panels, and auxiliary components. Included in the Technology are the Technology-related user manuals. This Designation will expire on July 31, 2016.

G4S Secure Solutions (USA) Inc.

June 09, 2011 – G4S Secure Solutions (USA) Inc. provides Physical Security Services. The Technology represents the provision of armed and unarmed security personnel, not requiring security clearances, at commercial, government, and government-related facilities, excluding nuclear facilities and/or those facilities operating under license from the Nuclear Regulatory Commission. The Technology also includes the qualification and training of personnel who conduct these services pursuant to the training standards that Wackenhut uses, and all attendant manuals and technical documentation related to the above-listed services. The Technology does not include response to Acts of Terrorism that use chemical, biological, radiological or nuclear agents or materials. This renewed Designation will expire on June 30, 2016.

Messinger Mortuary & Chapel Inc. d/b/a Messinger Indian School Mortuary Inc.

June 09, 2011 – Messinger Mortuary & Chapel Inc. d/b/a Messinger Indian School Mortuary Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities,

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are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on July 31, 2016.

Visual Defence Inc.

June 08, 2011 – Visual Defence Inc. provides the VDI “SecurEye.®” The Technology The VDI “SecurEye.®” camera creates a digital “video” recording that will survive blasts caused by explosive devices and other catastrophic events. The Technology is designed for both surveillance and post-event forensic investigations by recording video in a self-contained package. This Designation will expire on June 30, 2016.

Pitney Bowes Inc.

June 07, 2011 – Pitney Bowes Inc. provides Biohazard Isolation and Screening System (BISS). The Technology is a mail isolation system used to screen parcels for biological agents. The BISS is used to take air samples from mail that has been placed inside an isolation bag. The collected sample can be used with a biological test kit or sent to a lab for evaluation. The Technology includes impermeable plastic bags, collection tubes, air pump, sealed filter cassette, and tags. Optionally available are integration with a biohazard testing kit (GeneXpert) and commercial off-the-shelf mail agitation system. This renewed Designation will expire on July 31, 2016.

United Technologies Corporation, UTC Fire & Security Corporation, and UTC Fire & Security Americas Corporation Inc.

June 07, 2011 – United Technologies Corporation, UTC Fire & Security Corporation, and UTC Fire & Security Americas Corporation Inc., provide MobileView®. The Technology is a mobile surveillance system consisting of digital video recorders, cameras, audio microphones, a variety of accessory and ancillary devices, and support services. The Technology is designed for deployment on public transit vehicles such as buses, paratransit

vans, and light rail and commuter rail vehicles. Also, the Technology can transmit digital and audio information to a monitoring station. Thus, when connected to a MobileView® network, centralized audio and video monitoring is possible. The Technology includes three MobileView® models: MobileView® 3, MobileView® 4, and MobileView® PENTA. Included in the Technology are: installation, maintenance, and support services; all service-related manuals, reference guides, and policies and procedures; and qualified personnel involved in deploying and servicing the Technology. This Designation will expire on July 31, 2016.

Satellite Air-Land Motor Service Inc.

June 03, 2011 – Satellite Air-Land Motor Service Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on June 30, 2016.

Africa 2000, Incorporated

June 03, 2011 – Africa 2000, Incorporated, provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by the TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, and adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on July 31, 2016.

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A. A. Rayner & Company, Ltd.

May 31, 2011 – A. A. Rayner & Company, Ltd. (d/b/a A. A. Rayner & Sons) Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on June 30, 2016.

Smiths Detection Inc.

May 19, 2011 – Smiths Detection Inc. provides the Protect System. The Technology is an early warning, crisis management system designed to operate in various settings such as subways, transportation terminals, and buildings. The Technology also includes selection criteria for various commercial-off-the-shelf devices, command and control hardware and software, and integration capabilities with existing infrastructure. This Designation will expire on June 30, 2016.

DisastersNet Inc.

May 13, 2011 – DisastersNet Inc. provides the Disaster Incident Management System. The Technology is a web and/or server-based incident management system that uses a proprietary methodology for conducting training exercises and managing incidents. The Technology also includes help-desk services; training services; optional hosting, on-site installation, and off-site data backup services; and the customization of multi-media exercise scenarios. This Designation will expire on May 31, 2016.

Priority 5 Holdings Inc.

May 04, 2011 – Priority 5 Holdings Inc. provides Touch Assisted Command and Control System. The Technology is a software suite that fuses disparate data sources, the output of various software tools, and the results of one or more simulations as layers over imagery the end-user independently obtained. The Technology also includes customization and installation services, and support per the maintenance agreement. This Designation will expire on May 31, 2016.

IntelliQuick Delivery Inc.

May 03, 2011 – IntelliQuick Delivery Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, and adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on June 30, 2016.

Emerald Logistics Solutions

April 18, 2011 – Emerald Logistics Solutions provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology will include, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology includes only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on May 31, 2016.

The Boeing Company

April 15, 2011 – The Boeing Company provides the Security Monitoring Infrastructure System. The Technology is a software suite which provides cyber security situational awareness and network security monitoring. The Technology also includes training, support, and all associated technical documentation. This Designation will expire on May 31, 2016.

Wave Dispersion Technologies Inc.

April 08, 2011 – Wave Dispersion Technologies Inc., a New Jersey corporation provides WhisprWave® Small Craft Intrusion Barrier™ (the “Technology”), a modular, rapidly deployable floating security barrier system designed to enhance maritime

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security by deterring, delaying, or impeding small boats traveling at high speed from approaching protected targets. Anchoring of the Technology is customized for each installation and involves use of a commercially available marine-grade anchoring system, based on need. This Designation will expire on May 31, 2016.

The University of Kentucky

March 23, 2011 – The University of Kentucky provides the Ferti-Safe Process. The Technology is the intellectual property defining a process for the production of an ammonium nitrate (AN) fertilizer that has been treated to render it less detonable than standard AN fertilizer. The Technology also includes test-market and research-scale quantities of the Ferti-Safe product that the Seller manufactures for the purpose of market evaluation and testing. This Designation will expire on April 30, 2016.

Honeywell International Corporation

March 16, 2011 – Honeywell International Corporation provides Enterprise Building Integrator. The Technology is a common software control architecture used to control a building or facility's security, life safety, and/or building maintenance (heating, cooling, ventilation, etc.) functions. The Technology also includes design, installation, integration, maintenance support, and customer training, and documentation services provided by Honeywell. The Designation for this Technology does not apply to or provide coverage for Acts of Terrorism that utilize chemical, biological, radiological, or nuclear agents or materials. This Designation will expire on March 31, 2016.

Chesley Brown International Inc.

March 16, 2011 – Chesley Brown International Inc., provides Physical Security Services. The Technology is physical security services including armed and unarmed security officers and security project management for commercial facilities. The Technology also includes processes to recruit, hire, and train and manage qualified personnel and all operational manuals. This Designation will expire on April 30, 2016.

Trans-Pak Inc.

March 10, 2011 – Trans-Pak Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft.

The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, and adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on March 31, 2016.

The Port Authority of New York and New Jersey

February 28, 2011 – The Port Authority of New York and New Jersey provides the Protective Sleeve for Suspension Bridge Suspender Rope Damage Mitigation. The Technology is a sleeve made of steel and cementitious material. It is designed to increase resistance of bridge suspender ropes to various threats. This Designation will expire on March 31, 2016.

Mulligan Security Corporation

February 23, 2011 – Mulligan Security Corporation provides Security Services. The Technology is physical security services that deter, prevent, detect, alert, and respond to a variety of security threats at high-rise commercial buildings, corporate facilities, and adjacent critical infrastructure in the New York Metropolitan area and in New Jersey. The Technology also includes the processes used to recruit, hire, train, and manage the qualified personnel who perform the above-described services. This Designation will expire on March 31, 2016.

L-3 Communications Security and Detection Systems Inc. and L-3 Communications Corporation

February 23, 2011 – L-3 Communications Security and Detection Systems Inc. and L-3 Communications Corporation provide the ProVision™ SC-100 (also known as the Scout 100) and ProVision™ 360 (also known as the SafeScout™ 360). The Technology is a line of security portals that use millimeter-wave scanning technology to produce three-dimensional images of subjects to detect threat objects. The Technology also includes training, installation, maintenance services, manuals, and technical documents. This renewed Designation will expire on March 31, 2016.

Quantum Corporation Inc.

February 23, 2011 – Quantum Corporation Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities,

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are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on March 31, 2016.

SAFRAN USA Inc. (a wholly owned subsidiary of SAFRAN Group), GE Homeland Protection Inc. (f/k/a GE InVision Inc.), Morpho Detection Inc., and Morpho Detection International Inc.

February 17, 2011 – SAFRAN USA Inc. (a wholly owned subsidiary of SAFRAN Group), GE Homeland Protection Inc. (f/k/a GE InVision Inc.), Morpho Detection Inc., and Morpho Detection International Inc., provide CTX™ Explosives Detection Systems. The Technology is used in screening, for example, checked airline baggage. It aids in the detection of explosives through the combined use of two types of X-ray images, computed tomography, and proprietary software algorithms. The Technology includes five models: CTX 2500™, CTX 5500 DS™, CTX 9000 DSi™, CTX 9400 DSi™, and CTX 9800 DSi™. Included in the Technology are customized services associated with the Technology's deployment such as installation, training, maintenance, and technical and logistical support. This renewed Designation will expire on March 31, 2016.

Lion Apparel Inc.

February 17, 2011 – Lion Apparel Inc. provides Chemical and Biological Protective Ensembles and Liquid Splash Protective Clothing. The Protective Ensembles are a family of multi-wear, multi-threat NFPA 1994 Class 2, Class 3, and NFPA 1992 protective suits designed to protect emergency first responder personnel at terrorism and emergency incidents involving vapor or liquid chemical and biological hazards. The SAFETY Act Designation for the Technology does not include protection from radiological and/or nuclear events. This Designation will expire on February 29, 2016.

DHL Global Forwarding and DHL Express

January 18, 2011 – DHL Global Forwarding

and DHL Express, and their parent entity DPWN Holdings Inc., provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on February 29, 2016.

Alclear LLC

December 21, 2010 – Alclear LLC provides CLEAR, which is a voluntary, biometrically secured, identification and access system. The Technology is intended to be used to expedite the screening process at airports. The Technology also includes support services necessary to install the Technology. This renewed Designation will expire on January 31, 2016.

NABCO Inc.

December 13, 2010 – NABCO Inc. provides NABCO Explosive Containment Vessels. The Technology is a series of vessels allowing for the safe containment, transport, and disposal of explosive devices. The Technology is designed to be used by experienced, trained emergency response personnel such as Explosive Ordnance Disposal or Bomb Squad personnel. Included in the Technology are all related manuals and documentation. This Designation will expire on January 31, 2016.

Shipco Transport Inc.

November 12, 2010 – Shipco Transport Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or

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or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on December 31, 2015.

IPC International Corporation

November 12, 2010 – IPC International Corporation provides Security Services. The Technology is unarmed physical security services at commercial facilities. The Technology also includes support services, documentation, etc. This renewed Designation will expire on December 31, 2015.

URS Corporation (Delaware), URS Group Inc.

October 22, 2010 – URS Corporation (Delaware), URS Group Inc., URS Corporation (Nevada), and URS Corporation Southern provide Threat and Vulnerability Assessment Services. The Technology provides threat and vulnerability assessment services, including analyses of threats; modeling and analysis of threats to structures; prioritization of threats as a function of probability and magnitude of impact; defining mitigation strategies; developing security plans and guidelines, and security system designs; and other support services for security operations. This renewed Designation will expire on November 30, 2015.

Barry International Forwarding Inc.

October 18, 2010 – Barry International Forwarding Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on November 30, 2015.

World Trade CFS LLC Inc.

October 18, 2010 – World Trade CFS LLC Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with

directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on November 30, 2015.

AllTranspack Inc.

October 06, 2010 – AllTranspack Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on November 30, 2015.

Trans-Expedite Inc.

October 06, 2010 – Trans-Expedite Inc. provides Certified Cargo Screening Facilities. The Technology, Certified Cargo Screening Facilities, are secure facilities established in accordance with directives issued by TSA for the screening and securing of cargo which will be transported on passenger aircraft. The Technology includes, in accordance with TSA directives, maintaining a security plan that limits access to secure cargo screening areas, training and vetting employees in accordance with TSA guidance, adherence to all TSA-specified chain of custody rules for this cargo, and use of TSA-approved methods and/or equipment for the screening of cargo. The Technology is limited to only those locations in possession of current TSA certifications for cargo screening facilities. This Designation will expire on November 30, 2015.

Appendix E: OSAI / SAFETY Act Projects FY 2011

SAFETY Act Developmental Testing and Evaluation Designations

Raytheon Company and Raytheon UTD Inc.

September 13, 2011 – Raytheon Company and Raytheon UTD Inc. provide the Controlled Impact Rescue Tool. The Technology is a hand-held excavation tool for emergency rescue in urban environments. This Developmental Testing and Evaluation Designation will expire on October 31, 2014.

Implant Sciences Corporation

August 26, 2011 – Implant Sciences Corporation provides Quantum Sniffer™ QS-B220 Benchtop Explosives Trace Detector. The Technology is a device designed to detect trace levels of explosives vapor and nanogram quantities of explosives particulates. This Developmental Testing and Evaluation Designation will expire on September 30, 2016.

RBC Shield LLC

July 27, 2011 – RBC Shield LLC, provides RBC Shield® Tiles. The Technology is self-adhesive, lead-lined, interlocking tiles intended for use in converting an unprotected space into a shelter-in-place to protect occupants from radiological, biological, and chemical threats. The Technology also includes training and training materials for professional installation, as well as do-it-yourself installation, of the Technology and construction of a shelter-in-place. This Developmental Testing and Evaluation Designation will expire on August 31, 2014.

BioDefense Corporation

July 07, 2011 – BioDefense Corporation provides the MailDefender™. The Technology is a mail decontamination device that decontaminates mail through a combination of thermal/radiation energy and steam. The decontamination process reduces the viability of biological pathogens potentially contaminating pieces of paper posted mail. The Technology includes training and support services. This Developmental Testing and Evaluation Designation will expire on July 31, 2014.

Bayer Material Science LLC

June 29, 2011 – Bayer Material Science LLC, provides Blast Resistant Barrier Wall for Buildings. The Technology is laminated polycarbonate panels bolted to a steel skeleton in a manner such that the panels can flex to absorb the shockwave from an explosive and effectively dissipate the energy via flexing of the panels and the transfer of energy from the panels and skeleton to the mass of the building. The Technology includes support services necessary for deployment. This Developmental Testing and Evaluation Designation will expire on July 31, 2014.

The Boeing Company

February 17, 2011 – The Boeing Company provides Boeing's Virtual Port – Situational Awareness Systems for Maritime Domain Applications in Support of the Port of Long Beach. The Technology interfaces with third-party systems to provide geo-spatial and domain awareness in a Common Operating Picture by combining real-time data feeds, information from data mining, and quality Geographic Information Systems information for the Port and surrounding areas. The Technology also includes training, technical support, and technical documentation. This Developmental Testing and Evaluation Designation will expire on February 28, 2014.

Northrop Grumman Security Systems LLC

February 01, 2011 – Northrop Grumman Security Systems LLC provides WatchNet-3G. The Technology is a BioWatch Generation-3 candidate and includes an automated biological agent detector deployed in accordance with BioWatch Gen-3 Program test specifications issued by DHS. The Technology also includes logistics support, preventative and corrective maintenance, training, installation and setup, teardown, data collection, and a secure data monitoring network with the ability to transmit data securely to remote locations. This Developmental Testing and Evaluation Designation will expire on February 28, 2014.

Fisher Research Labs Inc.

November 03, 2010 – Fisher Research Labs Inc. provides the M-Scope. The Technology is portable walk-through metal detection system designed to alert operators to the presence of threat objects located on a person's body. This Developmental Testing and Evaluation Designation will expire on November 30, 2013.

“...today, more than ever before, science holds the key to our survival as a planet and our security and prosperity as a nation. It is time we once again put science at the top of our agenda and worked to restore America’s place as the world leader in science and technology.”

— President Barack Obama

