FIRST RESPONDER TECHNOLOGIES: ENSURING A PRIORITIZED APPROACH FOR HOMELAND SECURITY RESEARCH AND DEVELOPMENT

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON EMERGENCY PREPAREDNESS, RESPONSE, AND COMMUNICATIONS

AND THE

SUBCOMMITTEE ON CYBERSECURITY, INFRASTRUCTURE PROTECTION, AND SECURITY TECHNOLOGIES

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FIRST RESPONDER TECHNOLOGIES: ENSURING A PRIORITIZED APPROACH FOR HOMELAND SECURITY RESEARCH AND DEVELOPMENT

Wednesday, May 9, 2012

U.S. HOUSE OF REPRESENTATIVES,
COMMITTEE ON HOMELAND SECURITY,
SUBCOMMITTEE ON EMERGENCY PREPAREDNESS,
RESPONSE, AND COMMUNICATIONS, AND
SUBCOMMITTEE ON CYBERSECURITY, INFRASTRUCTURE
PROTECTION, AND SECURITY TECHNOLOGIES,
WASHINGTON, DC.

The subcommittees met, pursuant to call, at 11:02 a.m., in Room 311, Cannon House Office Building, Hon. Gus M. Bilirakis [Chairman of the Emergency Preparedness, Response, and Communications subcommittee] presiding.

Present from the Subcommittee on Emergency Preparedness, Response, and Communications: Representatives Bilirakis, Walberg, Long, Clarke of New York, and Richmond.

Present from the Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies: Representatives Lungren, Marino, Richardson, and Clarke of Michigan.

Mr. BILIRAKIS. Good morning. It is still morning. The Joint Hearing of the Committee on Homeland Security, Subcommittee on Emergency Preparedness, Response, and Communications and the Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies will come to order.

The subcommittees are meeting today to receive testimony on Federal efforts to research, develop, and deploy technologies to help first responders achieve their vital missions. I now recognize myself for an opening statement.

I am pleased our two subcommittees are once again meeting to consider a topic of mutual interest and concern. Our Nation's first responders are vital members of the Homeland Security Enterprise. First responders at the State and local level are first on the scene of a terrorist attack, natural disaster, or other emergency and we must ensure that they have the training, equipment, and technology they need to get the job done.

The Department of Homeland Security Science and Technology Directorate through its First Responder Group has taken steps to work with Federal partners, the first responder community, and the private sector to research, develop, and get to market technologies that will enhance response capabilities.

I want to thank Dr. Griffin for bringing some of the technologies—and they are right here—that S&T has developed along with him today. So thanks for bringing them, Doctor. I appreciate it very much. They provide great examples of S&T's on-going work.

I am interested in hearing from our Federal witnesses about how technology requirements and standards are set for this technology and how successful we have been in getting these promising technologies into the hands of first responders. I am also interested in hearing how DHS assists first responders in identifying appropriate technology as they consider how to allocate grant funding.

From our first responder witnesses, I am interested in your perspective in how the technology research and development process is working, and how well your input is being integrated into that process. I will say that I am disappointed that FEMA declined to participate in today's hearing.

FEMA's National Integration Center and Grant Programs Directorate regularly work with S&T and the first responder community and provide resources for technology identification and procurement through grant funds, responder knowledge base, and project responder. It would have been nice, of course, to have their input in today's hearing. So I am very disappointed. However, the subcommittees' oversight of this issue will continue after this hearing and that oversight will include FEMA.

With that, I welcome our distinguished panel of witnesses and we look forward to your testimony.

The Chairman now recognizes the Ranking Member of the Subcommittee on Emergency Preparedness, Response, and Communications. Of course, the gentlelady and the Ranking Member from California, Ms. Richardson, you are recognized.

Ms. RICHARDSON. Good morning. Thank you, Mr. Chairman Bilirakis and also Mr. Lungren for supporting this hearing today.

As Ranking Member on Emergency Communications, Preparedness, and Response Subcommittee, and also a Member of Cybersecurity with my colleague here from New York, Ms. Clarke, I have a documented interest in ensuring that Science and Technology Directorate effectively meets the needs of first responders.

Today, we will hear from Dr. Griffin on Science and Technology Directorate's efforts to better meet the needs of first responders like others on this panel. Yet, I equally am concerned, as Mr. Bilirakis has just stated, of FEMA's failure and its decline to appear and testify before us today. Discussing FEMA's role in ensuring that our first responders have the equipment they need to respond to disaster safely and effectively should be a priority for all of us.

In previous hearings, this committee has joined with the Government Accountability Office and the Department of Homeland Security's Inspector General to raise appropriate questions about S&T's efforts to meet the responsibilities to the first responder community. Before 2009, concerns were brought to the Director regarding the inadequate conduct of adequate outreach for first responders in the community. It was noted before 2009 that S&T had not identified the needs of first responders. If a system to identify needs does not exist, then the assignment of priorities certainly cannot be done in a meaningful way.

Equally, last November, Under Secretary O'Toole appeared before the Subcommittee on Cybersecurity to discuss her efforts to reorganize S&T and to put it on the right track. At that same time, she informed us of her efforts to establish a first responder group to identify the priorities of the first responders community and to allocate appropriate resources accordingly.

Further, the Under Secretary was made aware of and had discussed herself the improvements and the mechanisms that she had established to ensure that taxpayer dollars are used effectively about the effect of budget cuts that would occur on S&T's first responder activities. The Under Secretary was candid with this committee about the impacts of the Congressional budget cuts that would allow S&T to address only two or three of the 11 first responder priorities identified by the National Academy of Public Administration.

It is unfortunate that as S&T is working to become more responsive to the needs of first responders, Congress is significantly reducing its ability to do so by cutting its funding. Today, as the Appropriations Committee on Homeland Security marks up the Department's budget, I think it is important to bear in mind how S&T's budget affects its ability to work to get things done and to ensure that S&T has the proper infrastructure to invest the money necessary that we have deemed in this committee. Although S&T has made progress since 2009, more must be done to fully carry out the R&D strategies and to fully implement the evaluation metrics.

I am also eager to hear from representatives of the first responder community about their technology needs and whether they feel the Department has effectively solicited and responded to their input. Current challenges do exist and we need to make sure that they are removed.

I look forward to the testimony today and I yield back the balance of my time.

Mr. BILIRAKIS. Thank you very much. Now I recognize the Ranking Member of the Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies, the gentlelady from New York, Ms. Clarke, you are recognized.

Ms. CLARKE of New York. Thank you very much, Mr. Chairman. I thank the Ranking Member, Ms. Richardson, as well as Chairman Lungren for convening this joint hearing.

Having a closer look at how the Homeland Security Enterprise and First Responders Groups operates in S&T will be valuable. I also want to welcome all of our witnesses, especially my fellow New Yorker, Chief Ed Kilduff. Thank you for taking the time from your responsibilities to come to Washington today.

Over the years, many of our successes have come from our ability to forge practical solutions from tough challenges. This committee has been supportive of the S&T Directorate in becoming better prepared to make such contributions for first responders. This progress is due to the hard work of S&T's people, our better understanding of the precise problems, and to the increasing capacity to make use of innovation from our laboratories, universities, and the private sectors.

The S&T Directorate has found it challenging to craft an overall strategy for first responder needs. It has also lacked the mecha-

nisms necessary to assess past performance. Over the past few years, GAO and OIG reports have suggested that the Department had not yet developed a transparent, risk-based methodology to determine what first responder projects to fund, how much to fund, and how to evaluate the project's effectiveness and usefulness. Without clearly defined metrics, Congress cannot gauge project goals and evaluate funding.

I am eager to hear of the strides that the first responder group may have made in evaluating first responder needs, developing new and readapting existing technology, creating standards and prioritizing how first responder R&D moves forward. What we do here in Washington affects how fire fighters, police, EMS technicians, border and maritime security, doctors and nurses protect Americans every day, especially in times of disaster.

One key issue in translating what works at the local level is finding a way to communicate success, so each jurisdiction doesn't have to reinvent the wheel. Local first responders must feel more empowered to develop strategic initiatives for themselves. They recognize the importance of interoperability and the collaboration across jurisdictional boundaries. They know that crises do not stop at city and county lines.

In the end, Congress needs to know how current first responder technology investments position S&T for the future. We must have a clear view of how first responder projects are aligned with customer requirements and how projects are prioritized and evaluated.

We have been told by Under Secretary O'Toole that decreases in S&T's budget will wipe out dozens of programs, stalling the development of technologies for border protection, detection of biohazards, cargo screening, and leaving in doubt research in IED detection. Striving to do more with less is always a symbol of an efficiently running program of any type, but trying to protect our citizens and Nation with programs that are backed by limited and dwindling science and technology assets is another matter.

There are serious concerns about what programs the Directorate will have to give up as result of the budget voted by the majority. I look forward to hearing from Director Griffin on how he will prioritize the project in a reduced Homeland Security Enterprise and First Responder Group operation.

I thank you, Mr. Chairman. I yield the balance of my time.

Mr. BILIRAKIS. Thank you, Ms. Clarke. I do want to report that this year's budget—this bill that is on the floor is $158 million above last year's level, so I am glad to see that.

Other Members are reminded that statements may be submitted for the record.

[The statement of Ranking Member Thompson follows:]

PREPARED STATEMENT OF RANKING MEMBER BENNIE G. THOMPSON

MAY 9, 2012

Good afternoon. I want to thank our witnesses for being here today.

To effectively prioritize resources, we need to align technology and training with the specific needs of our first responders.

Since fiscal year 2002, DHS has awarded $35 billion in Federal grant money. Because of significant budget cuts and grant consolidation, fewer resources will be available to the first responder community.

As the "boots on the ground" in every emergency and disaster, first responders have a unique vantage point on equipment needs and equipment failures.

The Department must have a two-way dialogue with the first responder community.

It is only through planning based on such a dialogue that Science and Technology will be able to prioritize its limited resources and conduct research and development that meets the needs of the first responder community.

It is my understanding that the Under Secretary has established a First Responder group to begin such a dialogue.

However, FEMA's involvement in this group is unclear.

As the agency within the Department with the most direct interaction with the first responder community, FEMA should be much more than a liaison.

Further, in light of budget cuts to the Science and Technology Directorate and the Homeland Security Grant Program, DHS must take a fresh look at its research and development resources.

S&T's activities must be designed to meet real needs.

In the past, I have had serious concerns about how the Science and Technology Directorate invested resources.

In 2009, for example, S&T funded a project on something called "brain music," which was billed as research that would help first responders.

This project had been funded for several years without any measurable results.

At the time, I questioned the wisdom of funding that project, and how it could have any practical use for a fire fighter, police officer, or other first responder.

After today's hearing, I want the Under Secretary to inform me whether the "brain music" project is still being funded.

I commend the Under Secretary for her reorganization of S&T and hope that the alignment of research with real needs will enhance this Nation's safety and security.

However, we all know that the austerity measures forced by this Congress will seriously undermine your ability to conduct meaningful research and development.

My colleagues on the other side of the aisle tout the need to do more with less. However, reducing the number of scientists and engineers involved in working on a problem does not help us arrive at solutions any sooner.

As Ben Franklin once said, "an investment in knowledge pays the best interest."

I look forward to the testimony of all of the witnesses, and I yield back the balance of my time.

Mr. BILIRAKIS. I now am pleased to welcome our distinguished panel of witnesses.

Our first witness is Dr. Bob Griffin. Dr. Griffin is the director of first responder programs in the Department of Homeland Security Science and Technology Directorate, a position he has held since August 2012—2010, excuse me.

Prior to joining DHS, Dr. Griffin served as the director of environmental services for Arlington County, Virginia. He also served as Arlington's director of emergency management and as the assistant county administrator and chief of fire and rescue in Loudoun County, Virginia.

Dr. Griffin earned his Ph.D. in Public Administration from Virginia Tech and his Master's degree in Public Administration and Bachelor's of Science in Political Science from UMass Amherst.

Following Dr. Griffin, we will hear from Ms. Mary Saunders. Ms. Saunders is the director of the standards coordination office at the National Institute of Standards and Technology.

Prior to her current position at the NIST, Ms. Saunders served as the deputy assistant secretary for manufacturing and services at the International Trade Administration. Ms. Saunders has been in Federal service for more than 30 years, including with the Department of Army and the U.S. Military Academy.

Next, we will hear from testimony from Chief Edward Kilduff. Chief Kilduff is from New York City, New York City's Fire Department, 34th Chief of Department, a position to which he has been appointed. He was appointed in January 2010.

Prior to his position, Chief Kilduff served as a Brooklyn Borough commander and has been a New York City fire fighter since 1977. Thank you for your service, Chief. Chief Kilduff has a Bachelor's of Arts degree in Political Science from Amherst College.

Following Chief Kilduff, we will receive testimony from Ms. Annette Doying. Ms. Doying is emergency management director for Pasco County, Florida, and serves as the Tampa Bay Emergency Management co-chair to Florida's Domestic Security Oversight Council.

Ms. Doying has been educated as an EMT and has trained in chemical, biological, radiological, nuclear, and explosives response. Ms. Doying also has a graduate degree in Applied Forensics Anthropology from the University of South Florida.

Finally, we will hear testimony from Kiersten—Ms. Kiersten Coon. Ms. Coon is the president and CEO of Liberty Group Ventures. She previously served on the staff of the U.S. Senate Committee on Governmental Affairs. Ms. Coon has a Public Policy degree from Princeton University and a Master's degree in Public Policy from the Kennedy School of Government at Harvard University.

I want to welcome all the witnesses. Your entire written statements will appear in the record. I ask that you summarize your testimony for 5 minutes. Again, welcome. I will ask Dr. Griffin to begin and you are recognized, sir. Thank you.

STATEMENT OF ROBERT GRIFFIN, DIRECTOR OF FIRST RESPONDER PROGRAMS, SCIENCE AND TECHNOLOGY DIRECTORATE, DEPARTMENT OF HOMELAND SECURITY

Mr. GRIFFIN. Good morning. Thank you. Chairman Bilirakis, Ranking Member Richardson, Ranking Member Clarke, Members of the subcommittee, I would like to begin by apologizing to anybody in the audience that hopes to hear from the quarterback for the Redskins. I am Robert Griffin. I am not that Robert Griffin. I am the Director of the Support to the Homeland Security Enterprise and First Responder Group in Science and Technology.

I joined the Federal Government August 2010, after 20 years of service in local government, including service as a fire chief and emergency manager.

My approach to the research and development for first responders is based on a mix of field experience, empathy, and a healthy dose of operational pragmatism. In December 2010, Under Secretary O'Toole realigned the Directorate and created a group to better understand, prioritize, and transition S&T's work to the first responder community.

I will present a quick overview of how we integrate first responder operational needs into our process, create methodologically valid approaches to drive critical funding decisions, promote innovation to meet capability gaps, and leverage partnerships to maximize our funding. To scope the challenge and opportunity of my role, the first responder community consists of over 80,000 different agencies, each of which has numerous needs and strong opinions on priorities.

To capture and prioritize the needs and requirements of this diverse and often divergent community, we developed a methodology to prioritize gaps and expand first responder participation.

In order to build trust, we created a transparent process to identify first responder needs in strategic programmatic areas. Working with FEMA and first responders from a cross-section of disciplines, geography, demographics, and levels of government, we commissioned a third iteration of Project Responder to identify and prioritize capability gaps. From these gaps, we developed projects based on a criterion that includes meeting operational needs, building on existing investments, leveraging interagency and private sector resources, promoting non-proprietary solutions, and increasing market competition.

We recognize that getting research to the field requires solutions that are affordable with a clear transition path. We have broadened our participation requirements gathering by leveraging ongoing work in the Interagency Board, professional associations, and other regional collaborative efforts. The use of multiple groups allows us to gather requirements from a larger cross-section of first responders, while validating gaps and funding priorities.

While strengthening the process is important, our measure of success is transitioning technologies to operational use. We have successfully commercialized the multi-band radio, the protective backboard cover, explosive and hazardous materials response application, the compact rescue tool, the dazzler, the pipe bomb cap remover for improved forensics and bomb tech safety. We have also developed technology, like the advanced breathing apparatus that you see in front of you with private-sector partners who are working to bring this technology to market.

Recent efforts have brought significant technology innovations to the first responder community, allowing them to become more resilient, efficient, and effective in executing their missions. Innovation is often limited by budget constraints, the capacity to incrementally incorporate new technologies into operations, while overcoming procurement, cultural, and functional challenges.

Innovation can be creative. The creative use of existing technologies, like Kevlar and Breathing Apparatus or Tyvek, act as an impervious barrier to protect patients from contaminated body fluids.

As a former fire chief, I am used to working in teams and leveraging others' resources. For example, building off the investments of the Department of Defense, we developed requirements that linked industry to the first responders to build and test the multi-band radio prototypes you see before you. The multi-band project provides a single radio capable of operating across disparate public safety radio bands. These radios are now available commercially from three manufacturers. In addition to local jurisdictions, ICE, the FBI, and Marine Corps are all procuring these radios for use.

We are also currently working with the Army's National Protection Center and NATICK, Kell Fire, the U.S. Fire Service, Australia, and the commercial sector to develop wildland fire fighter gear that improves radiant thermal protection, form, fit, and function, and reduces heat stress. This project leverages funding from

not only DHS, but DOD and the Department of Agriculture. During this summer's fire season, the gear will be field-tested by over a thousand fire fighters in California, as we work to reduce wildland fire fighter deaths and injuries.

Following Project Responder, we are working on virtual training, first responder tracking, hazard location, interoperable communications, and protective clothing and equipment. We will also continue to work in areas such as extending the operational life of existing technologies, technology forging, developing with NIST and others in communications, data sharing, ambulance safety, and alerts and warnings.

Every dollar we are allocated is targeted to improving the operations of the men and women like Chief Kilduff and Ms. Doying. My team recognizes that by keeping the first responders safer, directly translates to keeping the Nation safer.

Thank you for the opportunity to address the committee. I am happy to answer any questions you may have.

[The statement of Mr. Griffin follows:]

PREPARED STATEMENT OF ROBERT GRIFFIN

MAY 9, 2012

INTRODUCTION

Good morning Chairman Lungren, Chairman Bilirakis, Ranking Member Clarke, Ranking Member Richardson, and Members of the subcommittees. Thank you for inviting me to speak with you today about our efforts to develop technologies to assist first responders.

The Department of Homeland Security (DHS) remains committed to helping first responders Nation-wide by ensuring that they are prepared, equipped, and trained for any situation and by bringing together information and resources to prepare for and respond to a terrorist attack, natural disaster, or other large-scale emergency. The DHS Science and Technology (S&T) Directorate's mission is to strengthen America's security and resiliency by providing knowledge products and innovative technology solutions for the Homeland Security Enterprise (HSE). To meet the diverse needs of the HSE, S&T provides value by pursuing a strategy which is operationally focused, highly innovative, and founded on building strong partnerships. As the primary research, development, testing, and evaluation agency for the first responder community, S&T provides the HSE with strategic and focused technology options and operational process enhancements. S&T provides 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.

This commitment is reflected in S&T's third strategic goal, which charges the Directorate to "strengthen the Homeland Security Enterprise and First Responders' capabilities to protect the homeland and respond to disasters." To meet this goal S&T created the Support to the Homeland Security Enterprise and First Responders Group (FRG) to foster S&T's understanding of the needs and requirements of responders. The responder community consists of more than 60,000 disparate agencies across a variety of disciplines, including but not limited to fire, law enforcement, emergency management, and emergency medical services. By engaging first responders at every stage of the technology development cycle, FRG pursues a better understanding of their functional needs and requirements, and develops innovative solutions to their most pressing operational challenges. Without an effective research, development, testing, and evaluation program that specifically address their needs, responders have largely either done without or relied on vendor-driven solutions.

Since it was created in December 2010, FRG has committed to understanding the mission and operational requirements of first responders, creating high-impact technologies and knowledge products, improving interoperability of equipment, and increasing first responders' access to technical- and science-based information. To maximize limited funding, FRG is focusing on advanced technologies that address the greatest multi-functional need and that can be developed for first responders

within a 12- to 18-month time frame—providing them access to new technology that meet at least 80 percent of their requirements. FRG has also focused on building methodologically sound processes to define and prioritize first responder needs while engaging responders at all levels of government. This process has allowed FRG to fund the highest-priority projects identified by practitioners and leverage resources from partners within DHS and across other levels of government to create the greatest impact.

GUIDING PRINCIPLES

To safely and effectively respond in dangerous environments, first responders need access to better technology and equipment. FRG approaches project solutions with pragmatic criteria in mind. Through direct engagement with first responders, FRG has identified several guiding principles used as criteria to assist with identifying solutions including:

- *Practitioner-Driven Approach*.—Recognizing that initiatives must be based on user needs and driven from the field.
- *Building on Existing Investments*.—Encouraging efficiencies by building on existing investments saves money by avoiding unnecessary and costly new hardware, software, data development, and training.
- *Leveraging Existing Solutions*.—Conducting environmental scans to help leverage existing interagency and private sector solutions before any investments in new solutions are made.
- *Daily Use Solutions*.—Seeking technological solutions that improve not only catastrophic response but daily use by first responders.
- *Non-Proprietary Solutions*.—Ensuring that technologies from different manufacturers can actually interoperate requires the use of open-source, non-proprietary solutions.
- *Affordable and Accessible Solutions*.—Recognizing that solutions need to be affordable and commercially available for purchase.

SOLUTION DEVELOPMENT PROCESS

In 2009, S&T established the First Responder Integrated Product Team (IPT), often referred to as the 13th IPT, to address the most critical needs of the first responder community. Building on the First Responder IPT, FRG established a more methodologically comprehensive process—known as the Solution Development Process (see Figure 1)—to identify and address the most critical needs of the community.

In partnership with first responders, FRG uses the Solution Development Process to identify, validate, and facilitate the fulfillment of needs through the use of existing and emerging technologies, knowledge products, and standards. This process focuses FRG's limited funding on priorities identified by the first responder community. The process provides methodological rigor and allows for programmatic prioritization before projects are funded. This has helped ensure that related projects are coordinated, thereby consolidating efforts and saving time and money. The Solution Development Process is designed to operate within the broader S&T portfolio review process, which evaluates projects based on impact, transition, technology positioning, clarity of purpose, customer involvement, and innovation. Additionally, this process supports the S&T Resource Allocation Strategy which includes all activities and processes associated with the timely development and transition/transfer of S&T products.

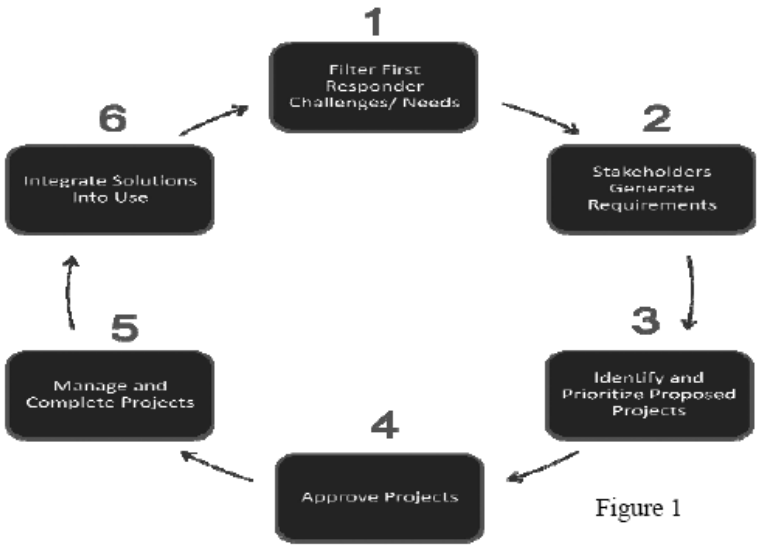

Figure 1

As part of the Solution Development Process, first responders from around the country including those serving on S&T's First Responder Resource Group (FRRG),[1] the InterAgency Board for Equipment Standardization and Interoperability (IAB),[2] and Project Responder[3] focus groups identify the current capability gaps faced by the community. These capability gaps are used by stakeholders to generate accompanying requirements. FRG uses the capability gaps, requirements, and its own analysis to inform its resource allocation and the private sector's research and development investments. FRG selects projects for funding based on a number of criteria including: The practitioner-identified gaps, criticality/operational impact, threat likelihood, applicability, state of the science, cost-benefit analysis, ease of integration, transition likelihood, and time needed to prototype. The responders work with FRG program managers throughout the life cycle of each project and assist DHS in creating awareness of these newly-developed solutions in the field. FRG then works with the first responder community and commercial sector partners to transition the technologies, standards, and knowledge products and integrate them into regular use.

First Responder Coordination

Direct first responder interaction is paramount to S&T's ability to deliver critically-needed solutions and technologies to the emergency preparedness and response community. S&T established the FRRG to aid in this mission by serving as a mechanism for continuous dialogue and the coordination of research, development, and delivery of technology solutions to first responders at the local, State, Tribal, territorial, and Federal levels. As part of the FRRG, responders from around the country are engaged throughout FRG's 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 addition to being geographically diverse, the FRRG membership represents jurisdictions of varying population sizes and budget size. The membership also represents the wide breadth of

[1] The FRRG includes over 120 practitioners from a wide array of professional disciplines representing all levels of the public sector.

[2] The IAB is a voluntary collaborative panel of emergency preparedness and response practitioners from a wide array of professional disciplines that represent all levels of government and the public sector.

[3] Project Responder is a partnership between FRG, the Homeland Security Studies and Analysis Institute, the IAB, and the Federal Emergency Management Agency's National Preparedness Directorate to identify capability gaps and prioritize areas of investment to address or reduce those gaps.

professions involved in emergency preparedness and response that includes, but is not limited to, leaders and experts in law enforcement, fire fighting, emergency medical services, emergency management, 9–1–1, public health, hospital preparedness, Geospatial Information Systems, and information security.

One of the areas both first responder and industry leaders identified as needing improvement was a clearer articulation of the funding priorities. Recognizing this, FRG has focused its resources on this critical first step of FRG's Solution Development Process. Project Responder 3 is the third iteration in a series of studies to identify gaps between current and required capabilities to ensure that responders can effectively and safely address catastrophic incidents, both now and in the future. By leveraging Project Responder 3 and the FRRG, FRG is currently focused on the following five highest priority areas:

- Readily accessible, high-fidelity simulation tools to support training in incident management and response.
- The ability to remotely monitor the tactical actions and progress of all responders involved in the incident in real time.
- The ability to know the location of responders and their proximity to risks and hazards in real time.
- The ability to communicate with responders in any environmental conditions (including through barriers, inside buildings, and underground).
- Protective clothing and equipment for all first responders that protects against multiple hazards (e.g., heat, smoke, blood-borne or airborne pathogens, and projectiles).

These priority areas are currently being used to help guide research and development investment by the Federal Government, as well as, local, Tribal, State, and territorial authorities, and the private sector.

Realized Solutions

One example of how FRG partners to bring solutions to operations is the Wildland Firefighters Advanced Personal Protection System. Wildland fire fighters are often required to respond to emergencies in remote areas. This can involve hiking from a staging area to the fire location. Because the fire season takes place during the warmest months of the year, wildland fire fighters frequently must work under extreme heat and humidity. The Wildland Firefighters Advanced Personal Protection System will help to reduce heat stress—a major concern for wildland fire fighting personnel who must wear and carry a significant amount of personal protective gear to perform their duties. FRG is working with the U.S. Army Natick Research, Development & Engineering Center's National Protection Center (Natick), the California Department of Forestry and Fire Protection (CALFIRE), the United States Fire Service, and others to develop a National Fire Protection Association (NFPA) certified garment system that improves radiant thermal protection; reduces heat stress; and improves form, fit, and function when compared to existing garment systems.

TECHNOLOGY TRANSITION

Transitioning technology for regular use by first responders remains a critical challenge for S&T. To help mitigate this challenge, FRG leverages the Center for Commercialization of Advanced Technology (CCAT) process, in coordination with San Diego State University, to solicit proposals from the vendor community for technologies that address gaps identified by first responders. The goal of this process is to develop technologies in 12 to 18 months that meet 80 percent or more of the requirement identified by the first responder community, with transition occurring 6 to 12 months after project completion. Should a capability gap be both unique and one that receives a high-priority ranking by practitioners, contracts may then be awarded. By using CCAT, FRG is able to bring first responders, industry, and business professionals together under one focus, which allows FRG to provide solutions more efficiently. This process ensures that each technology development is undertaken with a high probability of successfully transitioning to the first responder community.

A core focus of S&T is the rapid delivery of new technologies that address the mission needs of the first responder community. Over the past year, S&T has used Research, Development, and Innovation funding to develop technologies and knowledge products important to a range of homeland security activities and customers. FRG, with a cost share from industry, has been able to develop and transition technology solutions to the first responder community. Recent transitions include:

First Responder Equipment

- *Board Armour™ Backboard Cover*.—Repurposing the Tyvex™ material used to wrap houses in construction, S&T, in partnership with Advanced EMS Designs,

developed a disposable backboard cover to better protect patients and responders from disease and contaminants. This product was developed, tested, and commercialized in less than 8 months. It is now commercially available for about $10.

- *Next-Generation Self-Contained Breathing Apparatus (SCBA)*.—S&T partnered with the Mine Safety Appliance Company to integrate and certify S&T's lighter and smaller profile SCBA cylinder array into a full SCBA ensemble that has been certified by the Department of Transportation and tested against National Fire Protection Association standards. This represents the first major redesign in decades of this critical piece of first responder safety equipment.
- *First Responder Support Tool (FIRST)-Bomb Response*.—S&T partnered with Applied Research Associates, Inc. to develop a smartphone application that provides authorized first responders the information necessary to safely control incident locations such as stand-off distances, rough damage and injury contours, nearby areas of concern (e.g., schools and daycare centers), and suggested roadblocks that could help isolate an incident. FIRST-Bomb Response also provides improvised explosive device and HAZMAT guidelines, reference information, and points of contact to call for questions and assistance. This capability is available through the Apple App store, the Android Market, and the ARA Store for laptops.
- *Semi-Autonomous Pipe Bomb End Cap Remover (SAPBER)*.—This technology removes end caps from pipe bombs while keeping operators at a safe distance and collecting video and physical evidence from the pipe bomb. SAPBER is a small, low-cost system capable of remote operation and accommodating a range of possible pipe bomb sizes and configurations.

Interoperable Communications Solutions

- *Multi-Band Radio (MBR)*.—To provide a successful coordinated response, emergency responders must be able to effectively communicate with all partners across jurisdictional lines, including local, regional, State, and Federal entities. Until recently, no public safety radio existed that was capable of operating on more than one radio band. S&T developed the requirements for a hand-held MBR that allows first responders to communicate with partner agencies, regardless of the band on which they operate. The first responder communities in Chicago, Illinois, Miami, Florida, and New Orleans, Louisiana participated in highly successful pilots of the technology. S&T's efforts sparked industry interest: MBRs are now commercially available from four manufacturers (Thales Communications, Inc., Harris Corporation, Datron World Communications, and Motorola Solutions, Inc.). Recently the Federal Bureau of Investigation and the United States Marine Corps both announced they would be procuring MBRs for operational use. This project is just one example of how FRG efforts can result in useful market competition.
- *Voice over Internet Protocol (VoIP)*.—This project enables legacy analog radio systems to interoperate with similar systems as well as with new digital systems. Given the need for standardized implementations, the VoIP Working Group is producing specifications, or implementation profiles, for the most critical VoIP interfaces. The first VoIP specification developed by the working group is the *Bridging Systems Interface (BSI) Core Profile,* which allows first responder agencies to seamlessly connect radio systems over an IP network regardless of the manufacturer. Thirteen manufacturers voluntarily adopted the BSI platform and others have committed to doing so in their next product cycle. This helps reduce costs for first responder agency's system design and installation.
- *Virtual USA® (vUSA)*.—A collaborative effort among S&T, other DHS agencies, and State and local emergency management agencies, vUSA improves information sharing among agencies and other partners. vUSA is a blend of process and technology that provides a virtual pipeline to allow data (such as the operational status of critical infrastructure or emergency vehicle locations) to be shared by different systems and operating platforms with no changes to the current system. Selected as a White House Open Government Initiative and a flagship DHS Open Government Initiative, vUSA is currently in use in 23 States. Earlier this year, FRG initiated a pilot in the Northeast to integrate vUSA and the Next-Generation Incident Command System (NICS). NICS improves first responder situational awareness, collaboration, and interagency interoperability during disaster response efforts by displaying incident information—such as road closures and fire hot spots—on a shared on-line map, allowing it to be shared between local agencies and local-to-State. The San Diego County Board of Supervisors has agreed to use vUSA/NICS as the primary way of sharing in-

formation within the county as well as with other agencies outside of San Diego County. The CALFIRE is also adopting vUSA/NICS as their incident command and data sharing system. Partnering with the DHS Office of the Chief Information Officer's Office of Operations Coordination and Planning, S&T plans to make vUSA/NICS available as part of the Homeland Security Information Network (HSIN). vUSA users now have HSIN accounts, which allows them to access a new HSIN Community of Interest that provides a suite of collaboration services such as web conferencing and instant messaging and access to new geospatial data.

- *Commercial Mobile Alert Service (CMAS)*.—This program provides a National capability to deliver relevant, timely, and geographically-targeted messages to mobile devices. In December 2011, New York City partnered with S&T and the Federal Emergency Management Agency (FEMA) to conduct the first end-to-end test of the CMAS tool. CMAS has reached its initial operating capability and S&T is working on several research, development, testing, and evaluation activities designed to improve current and future system capabilities.
- *Emergency Data Exchange Language (EDXL) Suite of Standards*.—These standards help responders share critical data in any form. By sending messages to tablets, computers, and phones with EDXL-compliant software, real-time information arrives at the fingertips of those who need it most. EDXL standards are helping provide the ability to exchange all-hazard emergency alerts, notifications, and public warnings as well as to the exchange of hospital status, capacity, and resource availability/usage information among medical and health organizations and emergency information systems.

In fiscal year 2012, FRG is working on additional projects including:

- *Heads Up Display for HazMat Suits*.—This device will monitor the internal and external temperatures both inside and outside a responder Level-A suit and will provide a warning when hazardous temperatures are reached.
- *Improved Structure Glove*.—This next-generation high dexterity structural fire glove will dramatically improve water repellency, heat and flame protection, puncture resistance, dexterity, and don and doff ability.
- *Wireless Vital Sign Monitoring*.—This hands-free body-worn system, lacking any external wires, will measure vital signs and properties through a short-range wireless interface, and during transport, will transmit data from the ambulance to a receiving hospital through a long-range wireless interface. In an effort to leverage DoD's work in this area, this project uses the 1401 Technology Transfer Program to make use of similarly developed DoD technology. FRG is in the process of awarding a contract to modify the technology so it can be used by EMT emergency responders on the civilian side.
- *Next Generation Textiles for Personal Protective Equipment (PPE)*.—FRG is working across the S&T community to identify current technology and research efforts to determine the feasibility of a material that could provide protection against multiple threats (e.g., chemical/biological agents, ballistic, puncture, and fire/thermal) while maintaining wearer comfort. By improving the normal response garments, FRG will ensure that first responders have safer PPE that will protect them—even in unexpected incidents. This project is part of S&T's Small Business Innovation Research Program that was initiated in 2004. Two solicitations are issued per year and consist of topics that address the needs of the seven DHS Operational Units (e.g., U.S. Coast Guard, U.S. Transportation Security Administration, U.S. Customs and Border Protection, Federal Emergency Management Agency), as well as first responders.
- *National Information Sharing Consortium*.—FRG is partnering with a core group of leaders in State and local government to build the National Information Sharing Consortium to address and promote State-wide information sharing and data interoperability. The purpose of the Consortium is to promote private investment and creativity to enhance data sharing and the creation of collaborative technologies and exchange environments. The Consortium's activities will include the sharing of software code, applications, and model practices. The Consortium will oversee the on-going transition of vUSA as an operational capability for local and State use.
- *Virtual Training*.—FRG is conducting research to leverage existing Government funding investments and technological advances that use capabilities available in the gaming industry, interagency simulations, and virtual interactive training to promote different first responder operating training opportunities. Virtual training can dramatically reduce training costs, help standardize training—especially for multi-agency events—and make it possible to provide more responders the training required to respond to emergencies.

FRG also works closely with other elements of S&T to improve first responders' operational capabilities. Additional examples of S&T's recent transition successes include:

- *Controlled Impact Rescue Tool (CIRT).*—Decreases by 85 percent the time it takes to breach reinforced concrete walls while increasing first responders' control and overall safety. S&T demonstrated and transferred CIRT to Fairfax County Fire and Rescue, who routinely deploy internationally to assist in rescues from disasters both natural and man-made. CIRT is now commercially available from Raytheon Corporation, which shared development costs with S&T.
- *Explosives Trace Detection.*—For checked baggage screening, this next-generation device is ten times more sensitive than existing systems, can detect narcotics as well as explosives, and is similarly priced to existing machines. The system is currently undergoing operational testing with the Transportation Security Administration and will be commercially available within a year.
- *SportEvac.*—This is computer modeling software developed by S&T that provides simulation of evacuations allowing venue operators to determine the safest evacuation and optimum plans and procedures. The Indianapolis Department of Public Safety used SportEvac in their security and safety planning for this year's NFL Super Bowl. This technology is covered by the SAFETY Act.[4]
- *Geo-spatial Location Accountability and Navigation System for Emergency Responders (GLANSER).*—A tool which allows incident commanders to locate and track personnel inside enclosed areas. Honeywell, Inc. has begun to commercialize GLANSER.
- *Qualification Testing on White Powder Detector.*—S&T completed qualification testing for a commercially-available system that allows first responders to determine if suspicious white powders contain threat agents. The process relied upon the S&T-developed Public-Safety Actionable Assay standards that ensure local jurisdictions are using technology that meets rigorous specifications for accuracy and sensitivity.
- *System Assessment and Validation for Emergency Responders (SAVER).*—SAVER is an S&T program that provides knowledge products that enable responders to better select, procure, use, and maintain their responder equipment. The SAVER Program conducts objective assessments of commercial responder equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER focuses primarily on answering two main questions for the responder community: "What commercial equipment is available?" and "How does it perform?" The knowledge products produced by the SAVER Program are available to the responder community through FEMA's Responder Knowledge Base (RKB).

Moving forward, FRG will continue to serve as a voice for the first responder community. While FRG itself stood up in 2010, FRG's Office for Interoperability and Compatibility (OIC) was established in 2004.[5] OIC has a long history of developing solutions to help strengthen first responder communications for legacy systems. OIC's technical capability and firm understanding of first responder needs has resulted in a trusted relationship with the first responder community. Recently, FRG has played a similar role for DHS operational components serving as a technical resource for the DHS Tactical Wireless Communications Modernization Effort (TacNet) as the Department makes critical procurement decisions for communications systems. FRG intends on continuing to play this role for legacy systems as well as emerging systems that use new technology.

Not only is it important to develop and transition technologies, but it is also vital to inform the first responder community about the type of technologies and services that are available to them. FRG is committed to building high levels of trust with the field and does so through direct interaction with first responders. At the same time, FRG is continuing to identify effective, innovative, affordable ways to enhance those efforts, including working to increase the use of virtual meetings, brain storming platforms, and social media to strengthen our contacts with the field.

The Homeland Security Act of 2002 requires DHS to establish a Federal clearinghouse for information and technology, to encourage and support innovative solutions to enhance homeland security.[6] FirstResponder.gov and First Responder Commu-

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[4] The Support Anti-terrorism by Fostering Effective Technologies Act of 2002 (SAFETY Act) provides important legal liability protections for providers of Qualified Anti-Terrorism Technologies—whether they are products or services.

[5] 6 U.S.C. § 195.

[6] 6 U.S.C. § 193.

nities of Practice (FR CoP) are two websites that were developed by S&T to support this mandate. FirstResponder.gov debuted in January 2007 as a "one-stop" portal to enable local, Tribal, State, and Federal first responders to easily access and leverage Federal web services, information on resources, products, standards, testing and evaluation, and best practices, in a collaborative environment. In 2010, S&T unveiled a newly redesigned and enhanced FirstResponder.gov, which includes original news stories and communication tools to help first responders engage directly with DHS. FirstResponder.gov has more than 200 links to Federal, State, and local resources; is linked from more than 300 external sites; and is either the first or second website listed for a "first responder" query in both Google and Yahoo. FRG also developed the FR CoP. FR CoP is a professional networking, collaboration, and communication platform for first responders and others working in homeland security and provides an opportunity for responders to share lessons learned and best practices to assist other departments. FR CoP has approximately 3,000 members and more than 100 communities.

CONCLUSION

S&T is committed to developing technologies for and providing technology information to our first responders, to assist them in conducting their mission to protect the Nation more effectively, efficiently, and safely. While we have seen significant results, capability gaps remain and the response environment's constantly changing, which necessitates S&T to continually evaluate needs, required capabilities, and potential investments and innovations. S&T will continue to work with partners at the local, Tribal, State, territorial, and Federal levels to maximize investments as we develop new technologies to meet responders' highest priority needs. My vision for FRG is grounded in the principles I discussed earlier, and I look forward to achieving that vision for our Nation's first responder community.

Thank you for inviting me to appear before you today. I appreciate the opportunity to testify and would be pleased to answer any questions you may have.

Mr. BILIRAKIS. Thank you, Dr. Griffin. Now I recognize Ms. Saunders. You are recognized for 5 minutes. Welcome.

STATEMENT OF MARY H. SAUNDERS, DIRECTOR, STANDARDS COORDINATION OFFICE, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Ms. SAUNDERS. Thank you. Chairman Bilirakis, Ranking Members Richardson and Clarke, and Members of the subcommittees, thank you for this opportunity to discuss standards development and this role in standards that relates to equipment for and in support of our first responders.

NIST is a non-regulatory agency within the U.S. Department of Commerce, whose mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

Mr. Chairman, a U.S. voluntary consensus standards system is bottom-up, private-sector-driven, and sector-focused. The Government participates as an equal and very interested partner. In contrast to many other countries, the Federal Government does not control or direct the standards system in the United States.

As the Nation's measurement laboratory, NIST has multiple roles relating to standards in the Federal enterprise. This standards coordination function, defined by statute has been borne out by a track record of over a hundred years of technical excellence and objectivity. NIST's strong ties to the industry and the standards development community have enabled us to take on critical standards-related challenges and deliver timely and effective solutions.

NIST also leads the National Science and Technology Council Subcommittee on Standards, which brings together senior officials from across the Federal Government to engage on standards-related issues. NIST views standardization as an important tool to enable U.S. innovation and competitiveness, and facilitate the effective and efficient transfer of technology from the NIST laboratories to the marketplace.

Mr. Chairman, I would like to highlight for you some of NIST's programmatic activities that relate directly to standards development for a wide variety of first responder equipment, from telecommunications interoperability for public safety to materials research and more. One of the most important issues facing the first responder community is the current inability of telecommunications equipment to talk across systems or interoperate. NIST is deeply involved in the effort to foster interoperability.

The Middle Class Tax Relief and Job Creation Act of 2012 has allocated $7 billion in funding and made new broad-band spectrum in the 700 MHz band available to public safety, setting a foundation for a unified system operating on common spectrum bands that will foster Nation-wide roaming and interoperability and provide access to broadband data, video, mapping, GPS applications, and more. NIST Public Safety Communications Research Program, with support and funding from DHS S&T, has stood up a 700 MHz Public Safety Broadband Demonstration Network at our Boulder, Colorado campus, that serves both as a vendor-neutral environment and a test bed to aid and requirements gathering and standards development.

Leveraging our staff's expertise and the unique assets of the Boulder facilities, TSCR has taken steps to get the network up and running, including acquiring 700 MHz band class 14LTE commercial broadband equipment free of charge as part of a series of cooperative research and development agreements. Knowledge gleaned from network testing and evaluation will allow us to understand where current commercial standards meet public safety needs and where there are gaps. Identified needs will be incorporated into a standards development strategy.

Broadband presents a unique opportunity for public safety. It is crucial that public safety's requirements are reflected in the LTE standards, so that Federal grant dollars and taxpayer dollars are spent only on equipment that is both interoperable and performs as required under high user volume in emergency conditions, allowing first responders to better carry out their mission of protecting lives and property.

NIST has also been involved in research efforts within the National Institute of Justice to develop standards related to body armor. A key NIJ standard describes how body armor used by first responders should perform and includes methods for testing and evaluating the armor. Nearly every piece of body armor worn by law enforcement officers in this country complies with the NIJ standard.

Beginning in 2005, NIST provided assistance to NIJ to revise the standard to address a number of concerns. NIST developed a new protocol through which armor is exposed to an environment of elevated temperature, humidity, and mechanical tumbling, and then

subjected to ballistic tests. This proposed protocol has been incorporated into the most recent revision of the NIJ standard issued in July 2008 and continues to be used in NIJ's body armor compliance testing program.

NIST is creating critical solution-enabling measurement science and technical contributions underpinning emerging standards, codes, and regulations that are used to improve the safety and effectiveness of fire fighters. We are working with local and States' fire services, manufacturers, and a range of other Federal agencies on equipment such as self-contained breathing apparatus, thermal imaging cameras, and personal alert safety systems.

I will talk specifically about the PASS devices, which are designed to signal for aid if a fire fighter becomes incapacitated. NIST investigators found evidence that PASS signal failed to function properly in the fire fighter's environment. NIST determined that exposure to higher temperature environments negatively affected the loudness of the alarm signal. As it cooled, the alarm signal on most of the units returned to pre-exposure sound levels. NIST researchers, supported by DHS S&T, developed a new high temperature functionality requirement and test protocol, a life-saving improvement for each of the 1.25 million fire fighters whose past devices were upgraded.

Mr. Chairman, NIST, in conjunction with other Federal agencies, is focusing on developing test methods in a number of areas and has other activities focused on specific environments of interest in which the first responder community operates.

We look forward to continuing to work with our Federal, State, local, and private sector partners to improve safety and performance of our Nation's first responders. Thank you, again.

[The statement of Ms. Saunders follows:]

PREPARED STATEMENT OF MARY H. SAUNDERS

MAY 9, 2012

Chairmen Bilirakis and Lungren, Ranking Members Richardson and Clarke, Members of the subcommittees, I am Mary Saunders, director, Standards Coordination Office of the National Institute of Standards and Technology (NIST). I want to thank you for this opportunity to discuss standards development and NIST's role in standards as it relates to equipment for and in support of our first responders.

NIST is a non-regulatory Federal agency within the U.S. Department of Commerce. NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. Our efforts to drive innovation through advances in measurement science enable industry to bring technological advances to the commercial market sooner, thereby helping U.S. manufacturers stay globally competitive. The focus on innovation is critical if we are to, as the President and Secretary of Commerce John Bryson have noted, "make it here and sell it everywhere."

Today's hearing is focused on innovation as it relates to the development of standards for equipment used by or in support of the first responder community. My testimony will discuss the standards ecosystem in which NIST works, address the issue of standards as a help or hindrance to innovation in this space, highlight some examples of our work related to first responders, and the touch upon the technical challenges ahead.

THE STANDARDS ECOSYSTEM

Mr. Chairman, the U.S. voluntary, consensus standards system is bottom-up, industry-driven, and sector-focused. The Government participates as an equal and interested partner. Federal, State, local, and Tribal government representatives par-

ticipate when the activity is relevant to their needs, and consistent with their respective missions and functions. In contrast to the Government-directed, prescriptive standards that characterize the systems in place in a number of other countries, the Federal Government does not control or direct the standards system in the United States.

The modern-day engagement of the U.S. Government in the formal U.S. standards system can be traced back to the founding of the organization that has evolved into the American National Standards Institute (ANSI). In 1916, the Department of Commerce was one of the founding members of the American Engineering Standards Committee, formed to be an "impartial national body to coordinate standards development, approve national consensus standards, and halt user confusion on acceptability."[1]

Since the founding of the American Engineering Standards Committee, U.S. Government agencies have been extensively involved in the development and use of standards to meet agency missions and priorities. This engagement was catalyzed in 1995 by the passage of the National Technology Transfer and Advancement Act (Pub. L. 104–113), which directed Federal agencies to "use technical standards that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments",[2] except where inconsistent with applicable law or impractical.

The strength and agility of the U.S. standards system stems from its sector-specific focus. Individual industry and technology sectors are served by standards developing organizations that are sensitive to and responsive to that sector's needs, and understand the dynamics of that technology and industry. While there is no formal count of the number of standards developers in the United States, it is estimated that there are about 600 standards-setting organizations based in the United States.

THE FEDERAL GOVERNMENT'S ROLE

Federal Government agencies engage in standardization in a wide range of mission-specific roles, including contributing to development of standards in the private sector and using standards for procurement or regulatory actions. In fiscal year 2010, more than 2,800 Federal agency staff from across the Federal enterprise participated in more than 500 private-sector standards organizations. This participation is spurred in large part by the National Technology Transfer and Advancement Act (NTTAA) of 1995 (Pub. L. 104–113), and the associated OMB Circular A119. The NTTAA directs agencies to consider the use of voluntary consensus standards, in lieu of Government unique standards, and OMB A–119 reflects this direction and also strongly encourages agencies to participate in standards development activities to ensure that the resulting standards are better suited to meet agency needs.

NIST'S ROLE IN THE U.S. STANDARDS SYSTEM

NIST plays a critical role in the context of Federal engagement in the standards process. As the Nation's measurement laboratory, NIST has multiple roles relating to standards in the Federal enterprise. NIST's coordination function, defined by statute, has been borne out by a track record of technical excellence and objectivity, embraced by NIST's world-class scientists and engineers, ever since the Institute was chartered by Congress in 1901. NIST's strong ties to industry and the standards development community, backed by technical excellence, have enabled NIST to take on critical standards-related challenges and deliver timely and effective solutions.

NIST also plays a leadership role on the National Science and Technology Council's Subcommittee on Standards (SOS), which brings together senior officials across the Federal Government to engage on standards-related issues. In October 2011, the subcommittee issued a report, "Federal Engagement in Standards Activities to Address National Priorities: Background and Proposed Policy Recommendations," that provided an overview of the current legal and policy frameworks for Government engagement in private-sector standardization and conformity-assessment activities; described how the Government engages in those activities; summarized stakeholder observations in response to a request for information about Government engagement in standardization; and outlined policy recommendations to supplement existing guidance to agencies. As a follow-up to this report, the administration released

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[1] *http://www.ansi.org/about_ansi/introduction/history.aspx?menuid=1.*

[2] Pub. L. 104–113 National Technology Transfer and Advancement Act of 1995, § 12(d)(1). (available at: *http://standards.gov/standards_gov/nttaa.cfm).*

a memo in January 2012 highlighting the need for continued work in the standards area.[3]

NIST views standards and standardization as an important tool to enable U.S. innovation and competitiveness. NIST engagement in the private-sector-led standards system enables the effective and efficient transfer of technology from the NIST laboratories to the marketplace. This is further made possible by the participation of nearly 400 NIST technical staff in over 100 standards organizations, and more than 1,000 different standards activities, in support of domestic and international priorities. It is noteworthy that this number represents more than a quarter of the NIST technical staff. NIST's engagement with industry in these standards activities also provides us the ability to learn first-hand about industry's measurement, standards, and research needs, and this provides valuable input into our prioritization of current NIST programs and planning for future programs.

Mr. Chairman, I would like to highlight for you some of NIST's specific programmatic activities that directly relate to standards development for a wide variety of first responder equipment. Given the foundational nature of NIST's research mission in measurement science and standards, NIST technical expertise is being brought to bear across multiple sectors. From telecommunications interoperability for public safety to materials research, NIST technical expertise, in collaboration with industry, academia, and other Federal entities, such as the Department of Homeland Security's Science and Technology Directorate (DHS S&T), can improve the reliability, safety, and performance of equipment used by first responders across the country.

EXAMPLES OF NIST STANDARDS ACTIVITIES RELATED TO FIRST RESPONDER EQUIPMENT

700 MHz Public Safety Broadband Communications

This subcommittee is very aware of challenges facing the first responder community. One of the most important issues is the current inability of telecommunications equipment to talk across systems, or "interoperate". NIST is deeply involved in the effort to foster interoperability.

The public safety community is experiencing a generational shift in technology that will revolutionize the way it communicates. Traditionally, emergency responders have used land mobile radio technology that has limited data capabilities and suffers from a large installed base of stove-piped proprietary systems with non-contiguous spectrum assignments. As a result, public safety has long struggled with effective cross-agency/jurisdiction communications and lags far behind the commercial sector in data capability. The Middle Class Tax Relief and Job Creation Act of 2012 (Pub. L. 112–96)[4] has allocated $7 billion in funding and made new broadband spectrum in the 700-megahertz (MHz) band available to public safety, setting the foundation for a unified system operating on common spectrum bands that will foster Nation-wide roaming and interoperability and provide access to broadband data, video, mapping, GPS applications, and more.

The new Nation-wide public safety broadband network will rely on commercial cellular technology. However, the public safety community has several unique requirements that are not reflected in current broadband technology or the roadmap for future standards development. In an effort to identify those gaps in public safety's requirements and represent those to international standards bodies, the Public Safety Communications Research (PSCR) program [5]—with support and funding from DHS S&T—has stood up a 700-MHz public safety broadband Demonstration Network at the NIST/National Telecommunications and Information Administration (NTIA) laboratory at the Department of Commerce's Boulder, Colorado campus, that serves both as a vendor-neutral environment where public safety, industry, and other stakeholders can observe how new broadband technologies can meet public safety's unique communication needs as well as a test bed to aid in requirements gathering and standards development.

Leveraging the expertise of the PSCR staff and the unique assets of the Boulder facilities, including NTIA's Table Mountain Radio Test Site, PSCR has obtained an experimental spectrum license and has deployed an over-the-air broadband network, operating in the 700 MHz public safety broadband spectrum. The Demonstration Network has successfully acquired 700MHz Band Class 14 LTE broadband equip-

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[3] *http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-08.pdf*.

[4] Middle Class Tax Relief and Job Creation Act of 2012 (Pub. L. 112–96)—*http://www.gpo.gov/fdsys/pkg/PLAW-112publ96/pdf/PLAW-112publ96.pdf*.

[5] PSCR is a joint program of the Department of Commerce's NIST/OLES and NTIA/ITS that provides research, development, testing, and evaluation to foster Nation-wide communications interoperability for first responders.

ment—including eNodeBs, devices, evolved packet cores, and test equipment—free of charge as part of a Cooperative Research and Development Agreement (CRADA) process.

Research gleaned from Demonstration Network testing and evaluation will allow us to understand where current commercial standards meet public safety's needs and where there are gaps. The gaps that are identified will be incorporated into a standards development strategy.

Broadband presents a unique opportunity for public safety to define their requirements before deployment and only purchase systems that conform to the standard. It is crucial that public safety's requirements are incorporated into the LTE standard so that Federal grant dollars and taxpayer dollars are spent only on equipment that is interoperable and allows first responders to better carry out their mission of protecting lives and property. PSCR's Demonstration Network exists to facilitate this requirements gathering and standards development.

Body Armor

NIST has also been involved in research efforts with other Federal agencies such as the National Institute of Justice (NIJ) to develop standards related to public safety and criminal justice. One standard maintained by NIJ describes how body armor used by first responders should perform, and includes methods for testing and evaluating the armor. This standard has existed since 1972, and a testing program that relies on the standard has been in place since 1978. Nearly every piece of body armor worn by police officers in this country complies with the NIJ body armor standard.

An influential piece of legislation was enacted in 1998 that accelerated adoption and use of protective body armor by law enforcement. The Bulletproof Vest Partnership Grant Act of 1998 provided matching Federal funds to qualifying local and State agencies to make their body armor procurement dollars go farther. Grant recipients were required to have mandatory wear policies. As a result of this legislation and related grants: (1) Agencies were able to afford body armor for all of their officers, and officers were required to wear it; and (2) the body armor industry had incentives to continue advancing technologies to improve body armor.

To keep pace with technology advances, standards must continually be updated to reflect and encompass technological advancements while not inhibiting innovation by being overly prescriptive. Lags in updating standards may affect the adoption of newer technologies. New technologies may be introduced in advance of standardization. In the former case, delays may occur in the widespread deployment of new technologies. In the latter case, confidence in the technology or the reliability of the equipment utilizing the technology may suffer.

Consider an incident in 2003 when a police officer's body armor, or vest, was perforated by a round it was rated to stop. This incident illustrates the importance of ensuring that standards and technologies advance together. Until the late 1990s, most body armor worn by police officers was made of either aramid (Kevlar or Twaron) or polyethylene (Spectra or Dyneema). In this case, the armor was made out of a relatively new material, polybenzobisoxazole, or PBO, that was first introduced into body armor in 1998. The perforation of this vest in the 2003 case was the first known field failure in the 30-year history of the body armor standards program. In response to this incident, the U.S. Attorney General launched a safety initiative to examine soft body armor containing the material PBO.

Until this time, materials in common use had been studied previously and the most significant environmental factor affecting armor performance—liquid water—was a long-standing part of the standard testing protocol. NIST was tasked to undertake a research effort to examine PBO and its performance in fielded body armor performance and to make recommendations for improvements in the standards and testing program. NIST research revealed that PBO degrades due to exposure to moisture (humidity in the air or liquid water) as well as folding. It was clear that a revised version of the NIJ body armor standard that incorporated some measure of resistance to these environmental degradation factors was essential for officer safety.

Beginning in 2005, NIST provided assistance to NIJ to develop a revised body armor performance standard to address a number of concerns, one of which was the ability of the armor to withstand environmental and wear conditions that armor might see over its lifetime. NIST developed a soft armor conditioning protocol, through which armor is exposed to an environment of elevated temperature, humidity, and mechanical tumbling, and then subjected to ballistic tests. This protocol has been incorporated into the most recent revision of the NIJ body armor standard issued in July 2008 and continues to be used in NIJ's body armor Compliance Testing Program.

Since all officers want body armor that is lighter and more comfortable, new materials and new construction methods for body armor continue to be introduced into the marketplace. The body armor standard must be able to address the safety of new materials, both in initial use and over time. The armor conditioning protocol in the NIJ standard is an excellent first step in assessing the long-term field performance of body armor, but more work needs to be done and is in fact, the subject of on-going research at NIST.

First Responder Equipment

NIST is also creating critical solution-enabling measurement science and technical contributions underpinning emerging standards, codes, and regulations that are used to improve safety and effectiveness of the U.S. fire service. In 2009, the fire service responded to over 1.3 million fires[6] that resulted in 78,000 fire fighter injuries and 83 fatalities[7] with an estimated cost of $8 billion.[8] In order to reduce the number of fire fighter fatalities and injuries, science-based performance metrics are necessary to improve fire fighter safety and enhance fire ground effectiveness. For both equipment and tactics, it is critical that performance can be measured and evaluated in a scientifically sound manner. The lack of adequate measurement science directly impacts the protective equipment and tactics utilized by the over 1 million fire fighters in over 32,000 fire departments in the United States.

To respond safely and effectively in hazardous environments, fire fighters need access to better technology and equipment. If relevant performance data is available for existing equipment or tactics, then a meaningful performance metric can be developed, but too often the necessary data is not readily available. Lab- and full-scale tests in combination with science-based metrics will allow industry to evaluate and improve their own products and develop new technology.

For the past 9 years, NIST has been an active leader and participant in developing measurement science for fire service technology. Our Fire Research Laboratory has unsurpassed experience in fire testing and is a trusted source of unbiased, science-based, quantifiable recommendations to standards-developing organizations including the National Fire Protection Association (NFPA), ASTM, International Organization for Standardization (ISO), and the International Code Council (ICC).

NIST's unique role as a non-regulatory Federal agency, deep technical expertise, and unique assets enables industry, academia, and Federal entities to work with NIST collaboratively, to the benefit of all parties involved. NIST works with local and State fire services, manufacturers, the National Institute for Occupational Safety and Health (NIOSH) National Personal Protection Technology Laboratory, the Fire Protection Research Foundation of NFPA and others in this space.

In partnership with first responders, NIST identifies and prioritizes research needs for the fire service. This process focuses NIST's efforts on priorities identified by the fire fighting community. The 2005 National Fire Research Agenda Symposium,[9] which was attended by over 50 organizations, including the fire service, manufacturers, the International Association of Fire Chiefs, International Association of Fire Fighters, National Voluntary Fire Council, DHS, and the U.S. Fire Administration (USFA) identified and prioritized research needs for fire fighters. Some of the "urgent and critical issues" that were identified included improved respiratory protection, situational awareness technology, tactical decision aids, lessons learned/fire reconstructions, and strategies that would reduce injuries and fatalities. Over 60 participants at the 2009 NIST Innovative Fire Protection Workshop identified tactical decision aids, improved respirators, and enhanced turnout gear as high-priority research needs.

Examples of Fire Fighter Standard Solutions

- Self-Contained Breathing Apparatus (SCBA) Lenses: Fire fighters wear protective equipment to protect themselves from exposure to the harsh environment. SCBAs are designed to provide clean breathing air and prevent exposure to toxic combustion gases. NIOSH investigators noticed SCBA thermal degradation issues after the deaths of several fire fighters. NIST partnered with NIOSH to characterize the performance of the SCBA face piece in the fire fighting environment and determined that exposure to high thermal radiant flux caused the

[6] Karter, M.J., Fire Loss in the United States During 2009, National Fire Protection Association, Quincy, MA, August 2010.

[7] Karter, M.J., and Molis, J. L., U.S. Firefighter Injuries—2009, National Fire Protection Association, Quincy, MA, August 2010.

[8] "The Economic Consequences of Firefighter Injuries and Their Prevention," NIST GCR 05–874, March 2005.

[9] National Research Agenda Symposium Report of the National Fire Service Research Agenda Symposium June 1–3, 2005, Emmitsburg, Maryland.

viewing lenses to soften, form holes, and fail. With funding from the DHS United States Fire Administration and DHS S&T, NIST studied the conditions that may be encountered by fire fighters and the effects of those conditions on SCBA face piece lenses. This led to recommendations for a new test methodology and performance criteria to the NFPA Technical Committee on Respiratory Protection Equipment which are to be included in the 2013 Edition of *NFPA Standard 1981 on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services.*

- Thermal Imaging Cameras: Thermal imaging cameras (TIC) are becoming increasingly valuable tools for first responders; however, there were initially no performance standards that addressed the unique conditions in which first responders operate. Evaluating the performance of thermal imagers requires the resources to characterize the performance of thermal imagers, both in lab- and full-scale experiments and then developing performance metrics and standard testing protocols. NIST developed performance metrics and testing protocols to evaluate and ensure predictable performance of thermal imaging cameras that were incorporated by the NFPA Technical Committee on Electronic Safety Equipment into the 2010 edition of NFPA 1801 *Standard on Thermal Imagers for the Fire Service.* As this standard was put into place, each of the over 32,000 fire departments across the United States gained access to thermal imaging cameras that would perform as expected in the harsh fire conditions.
- Personal Alert Safety Systems (PASS): Fire fighters can be overcome by heat or smoke of a fire and may be unable to alert other fire ground personnel to their need for assistance. PASS devices are designed to signal for aid if a fire fighter becomes incapacitated. NIOSH investigators noticed that there was evidence the PASS alarm signal failed to function or was not heard by other personnel in the area. NIST again partnered with NIOSH to characterize the performance of PASS devices in the fire fighters' environment. NIST determined that exposure to high temperature environments typical of what a fire fighter encounters caused the loudness of the PASS alarm signal to be reduced enough to become indistinguishable from background noise on the emergency scene. As the PASS cooled, the alarm signal on most of the units returned to pre-exposure sound levels. NIST researchers, supported by DHS S&T, developed a new high temperature functionality requirement and test protocol for inclusion in the 2007 edition of NFPA 1982 *Standard on Personal Alert Safety Systems (PASS),* a lifesaving improvement for each of the 1.25 million fire fighters whose PASS devices were upgraded.

CONCLUSION

NIST continues its pursuit of measurement science to improve test methods and standards for advancing innovation for products used by everyone in the first responder community. NIST, in conjunction with other Federal agencies, is focusing on developing test methods in a number of areas, ranging from telecommunications interoperability to determining the performance of Radio Frequency Identification (RFID) and fire fighter locator systems, fire fighter radios, and fire fighter protective clothing in rough-duty environments. NIST has other activities focused on specific environments of interest in which the first responder community operates, such as guidance on non-traditional means to mitigate the fire hazard due to ventilation and suppression activities within structures in a manner that provides optimum safety and effectiveness for the fire fighter; and development of improved standards and building codes through simulations and experiments on structural vulnerabilities to wildland-urban interface (WUI) fires.

Mr. Chairman, thank you again for the opportunity to testify today. I would be happy to answer any questions the subcommittees may have.

Mr. BILIRAKIS. Thank you, Ms. Saunders. Chief, you are recognized now for 5 minutes.

STATEMENT OF EDWARD KILDUFF, CHIEF OF DEPARTMENT, NEW YORK CITY FIRE DEPARTMENT, NEW YORK, NEW YORK

Chief KILDUFF. Good morning, Chairman Bilirakis, Ranking Members Richardson and Clarke, and all subcommittee Members that are here. Thank you for the opportunity to speak with you today about the New York City Fire Department's homeland security technology efforts, our initiatives, and our innovations.

New York City remains a primary target for terrorists, due to its size, economic importance, complex infrastructure, and symbolic status. During the more than 10½ years since September 11, the Fire Department has made significant progress in preparing for future terrorist threats and natural disasters by increasing our capabilities and expanding our capacity to search for any significant event that threatens the lives of New Yorkers.

The most critical partners in supporting these initiatives, which are discussed in greater detail in our written submission to the subcommittees, are the Federal Department of Homeland Security and Congress. Since its inception almost a decade ago, DHS has recognized FDNY's unique role in protecting New York City and has awarded the Department more than $400 million to enhance our capacity to respond to terrorism. This funding has enabled the FDNY to provide specialized training and resources for our hazmat and rescue teams to improve internal and interoperable communications, and to provide commanders with better on-scene information and situational awareness.

We also use DHS grants to fund firehouse-based computerized training kiosks. Many of the drills and exercises provide all field units with tactical training for real-life incidents, such as bus bombings, subway attacks, incidents in the harbor, and all-hazards events.

With the limited time I have, I want to try to demonstrate to the subcommittee Members how DHS funding has been invested wisely in the FDNY, which works for the benefit of New York City, the New York Metropolitan area, the region, and all first responders. That investment has been made in each and every one of our 11,000 fire fighters and fire officers and 3,200 EMS members, who every day use the funded technology equipment, tools, and training to help save lives and increase the safety of the public and our first responders.

Imagine the scene of a large-scale or complex incident. As our first responders arrive, the incident command system and our tiered response matrix have already determined the roles that each member will play upon their initial arrival on the scene and as the incident escalates. At their disposal is an improved, three-part fire ground communication system, consisting of vehicle-based cross-band repeaters, high-powered portable command post radios, and handy talkie radios with customized channels.

Our members are equipped with improved gear in the form of radiological detectors and safer chemical protective clothing. They are supported on scene by mobile command vehicles, helicopter video feeds, new generation Marine response craft, and electronic command boards for control and tracking of resources. Leading these efforts are ICS-trained center commanders assisted by specialized squads and rescue companies, tactical support units, and haz-tech ambulances.

At the same time, our department leaders operate out of our state-of-the-art fire department operation center based in our Brooklyn headquarters. From this operational nerve center, commanders can oversee operations at the scene and exchange information with regional partners, while keeping a close eye on events unfolding in the rest of the city.

Throughout our operations, we utilize the electronic fire ground accountability system to facilitate on-scene accountability of first responders. From the scene, we can share voice, video, and data communications in real time with law enforcement, regional and mutual aid partners, city and State agencies, DHS, and other Homeland Security partners. As this scenario shows, FDNY has the resources and training to respond to a myriad of complex incidents. DHS funding has helped our first responders, the boots on the ground, immeasurably.

There is much more to be done, however. With DHS and its Science and Technology Directorate as our partner, we are confident that we will continue to find innovative solutions to address our on-going needs. We support the efforts of the S&T Directorate to create economies of scale by developing solutions that help the fire service and first responders Nation-wide. Due to anticipated reductions in grant funding going forward, this is not only practical, it is imperative.

Two areas where we think this is particularly critical for first responders are standards and testing and network command. Most fire departments throughout the country lack the resources to establish standards and test equipment themselves, especially in light of ever-increasing changes in technology. The S&T Directorate is uniquely situated to take the lead in the testing and development of National standards that we need for, among other things, CBRNE detection and mitigation equipment. We support, benefit from, and urge continued funding for these efforts.

Network commands, where commanders are linked to real-time data on desktop computers and mobile devices or via their operation centers, remain an unmet need. However, the S&T Directorate is piloting the Next-Generation Incident Command System, or NICS, a geo-special tool that can integrate data from diverse agencies and allows first responders to have a common operating platform.

The FDNY supports the S&T Directorate's efforts to develop this important tool for first responders. In fact, the FDNY recently tested NICS in a simulated hurricane exercise that we designed for West Point cadets involving the management of National Guard resources. With regard to DHS grant funding for the FDNY, we understand that DHS' focus will be on providing sufficient funding so that we can sustain our current capabilities, maintain the equipment and resources that we currently have, and support us as we continue to utilize our strengths and assets to protect the New York region.

As mentioned in the subcommittee testimony in more detail, we do have some concerns about the proposed changes for fiscal year 2013 Homeland Security Grant Cycle. First and foremost, we urge that funding be targeted to those areas at most risk for terrorism. Another concern is the compressed time frames proposed for Homeland Security grants that removes the flexibility we need to develop the complex systems and assets we require.

It is important that the technological advancements I have described can potentially become part of a Nation-wide integrated system of response that benefits first responders in every jurisdiction.

I thank you for allowing us to testify today and look forward to answering the committee's questions.

[The statement of Chief Kilduff follows:]

PREPARED STATEMENT OF EDWARD KILDUFF

MAY 9, 2012

Good morning, Chairmen Bilirakis and Lungren, Ranking Members Richardson and Clarke, and Members of the subcommittees. My name is Edward Kilduff and I am chief of department for the New York City Fire Department.

Thank you for the opportunity to speak with you today about the New York City Fire Department's homeland security technology efforts, innovations, and initiatives.

New York City remains a primary target for terrorists due to its size, economic importance, complex infrastructure, and symbolic status. During the more than 10½ years since 9/11, the Fire Department has made significant progress in preparing for future terrorist threats by increasing our capabilities and expanding our capacity to surge for any significant event that threatens the lives of New Yorkers. The most critical partner in supporting these initiatives—which I will discuss in more detail—is the Federal Department of Homeland Security (DHS), with the support of Congress.

DEPARTMENT OF HOMELAND SECURITY FUNDING

Since its inception almost a decade ago, DHS has recognized the FDNY's unique role in protecting New York City, and has awarded the Department more than $400 million to enhance our capacity to respond to terrorism.

This funding has enabled the FDNY to provide specialized training and resources for our HazMat and Rescue teams, to improve interoperable communications and to provide commanders with better on-scene information and situational awareness. We also use DHS grants to fund many of the drills and exercises that provide all field units with practical training for real-life incidents such as bus bombings, subway attacks, incidents in the harbor, and all-hazards events.

Looking forward, we understand that DHS's focus will be on providing sufficient funding so that we can sustain current capabilities, maintain the equipment and resources that we have, and support us as we continue to develop new-generation resources to protect the region's critical infrastructure.

INITIATIVES AND ENHANCEMENTS

In preparation for this hearing, we reviewed our homeland security initiatives and hoped to highlight in this testimony those that involved some technological component. Technology is an integral part of all of our initiatives—from our state-of-the-art new fireboats to all methods of field communications to our drills and training. So, with that in mind, allow me to briefly describe some of our highest-priority preparedness accomplishments.

Special Operations Command

The FDNY has rebuilt and significantly enhanced our Special Operations Command (SOC) capabilities, so that we are more prepared than ever to deal with incidents involving biological, chemical, or radioactive releases, and other major incidents with mass-casualty potential.

The underpinning of these enhancements is the "tiered response" system that we established to ensure the optimal availability and distribution of response resources. This tiered-response framework entails training FDNY units in a variety of response capabilities at incremental proficiency levels and strategically locating those units across the city. In addition to Hazardous Materials (HazMat) capabilities, this matrix maximizes the FDNY's capabilities to respond to any large-scale incident in a manner that is highly effective, economically efficient, and sustainable over the long term.

SOC includes five Rescue Companies, seven Squad Companies, our highly specialized HazMat Unit and the Marine Division consisting of three year-round and three seasonal Marine Companies. Rescue and Squad Company members receive the highest levels of training the Department offers in technical rescue and victim-removal—more than 280 hours of specialized rescue training in collapse response and rescue operations. All five Rescue Companies are SCUBA-qualified. All Rescue and Squad Companies have advanced hydraulic and search equipment for operating at building collapses and are trained and equipped for high-angle rescues.

All Fire and EMS personnel have received training to the HazMat Operations level.

To augment and support our SOC response, we can deploy:

- 25 SOC Support Ladder Companies, which are capable of providing personnel and equipment to support search-and-rescue operations;
- Four HazTech Engine Companies, whose members receive 80 hours of HazMat training;
- 35 HazTac Ambulance Units, whose vehicles are equipped to provide medical care in a HazMat environment;
- Two new state-of-the-art 140-foot fireboats, specially equipped with radiological detection capability, that can respond to chemical, biological, radiological, and nuclear (CBRN) incidents anywhere on or near the water;
- One new 65-foot state-of-the-art fast-response boat (with one on the way) with CBRN protection and radiological detection capability, three 33-foot fast-response rescue boats (with seven more on order), and one 31-foot medical response boat (with two more on order);
- One Decon, one SCUBA, and two Tactical Support Units and one De-watering Unit;
- A Re-breather Unit that allows us to operate for prolonged periods in hazardous environments;
- 29 Chemical Protection Clothing units; and
- Ten Rescue Medic Ambulances.

Organizational and Communications Infrastructure

Of course, enhanced capabilities are only one component of our preparedness goals. The FDNY has also taken steps to improve our organizational and communications infrastructures as well. The FDNY has:

- Expanded training in the Incident Command System for all Fire and EMS personnel;
- Developed a fully-staffed Incident Management Team (IMT), which was dispatched to New Orleans after Hurricanes Katrina and Gustav, and to Broome County, New York this past fall after Hurricane Irene;
- Launched an automated recall program that can target off-duty members to ensure resources are available to maintain coverage throughout the city during any emergency;
- Implemented a communications channel between on-scene fire fighters and the EMS command;
- Implemented a second EMS city-wide channel for Multiple Casualty Incidents;
- Established links to the MTA repeater systems to facilitate communications in the subways and tunnels;
- Designed and purchased two state-of-the-art Mobile Command Vehicles and an IMT/Planning Vehicle to assist in response coordination and communications;
- Finalized all-hazards emergency response plans for responding to terrorist threats and natural disasters;
- Developed an internal risk assessment website for priority locations;
- Assigned a fire officer, beginning in July 2012, to the National Counter Terrorism Center in McLean, Virginia;
- Established a connection to the U.S. intelligence community via the Homeland Security Data Network and Intelink, secret-level networks that link to finished intelligence to aid our overall readiness to meet the consequences of a terrorist attack;
- Enhanced our Bureau of Fire Investigation intelligence capabilities, including the assignment of Fire Marshals to the Joint Terrorism Task Force, the acquisition of top-secret clearance for National intelligence, the creation of a 24-hour hotline for FDNY members to report suspicious activity, and target hardening and protection of FDNY's critical infrastructure; and
- Established the Center for Terrorism and Disaster Preparedness to coordinate our counterterrorism planning and strategy.

The FDNY has also successfully deployed a three-part field communication system that represents a critical step in improved fireground communications. The system—designed and built in-house—consists of 13 vehicle-based, cross-band repeaters, which allow radio signals to be transmitted into dense building environments; 75 high-powered portable command post radios; and handie-talkie radios with several customized features that have improved on-scene tactical and command communications and fire fighter safety. These radios also provide us with full interoperability—the ability to speak with other city agencies and our mutual aid partners—helping to protect all first responders.

The FDNY has made important strides in strengthening EMS communications by adding a second city-wide radio channel. This additional EMS channel eliminates the overlapping frequencies between our command and city-wide channels, enhances the capability of EMS command at the scene of multiple incidents and allows for better utilization of frequency allocations for EMS Chiefs.

Technology and Network Command

As circumstances evolve at a disaster, a critical challenge is to ensure situational awareness for optimal incident management. This would include forming networks of voice, video, and data among multiple groups of emergency responders, Government agencies, and non-Government organizations—at the incident scene and at emergency operations centers away from the scene. The FDNY has leveraged our technology to create a common operational picture and interoperable networks for coordination and unified command.

To that end, we have implemented many long-term technology initiatives, which include:

- Building a state-of-the-art Fire Department Operations Center (FDOC), an operational nerve center at our 9 MetroTech headquarters that is fully activated for use by senior Chiefs in the event of serious fires and other large-scale incidents;
- Developing an enhanced real-time deployment and siting model for the Department; and
- Piloting wireless Electronic Command Boards for better on-scene command, control, and tracking of resources.

The FDNY also supports the efforts of the DHS Science & Technology Directorate to develop an integrated situational awareness platform for first responders called the "Next-Generation Incident Command System" or NICS. NICS is a geospatial tool that can integrate data from diverse agencies and allow first responders to have a common operating picture.

We understand that DHS is working with MIT's Lincoln Laboratory to pilot NICS and that NICS is currently supporting the integrated operations of California first responders, led by the California Department of Forestry and Fire Protection, or Cal Fire. The FDNY recently tested NICS in a simulated hurricane exercise that we designed for West Point Cadets involving the management of National Guard resources.

Virtual Training

Over the past year, with help from DHS, the FDNY created and introduced its kiosk e-learning platform in all FDNY firehouses and EMS stations. The computer-based training enables us to deliver training and situational awareness information to the field faster and more efficiently than ever before. Keeping our 15,000 fire fighters and EMTs trained and refreshed is a crucial—and costly—part of our mandate as we address the complexities of the post-9/11 environment. Using real-time, video-rich content captures the attention of our members and encourages on-going learning. Among its benefits are:

- Company officers use kiosk content to structure drills and education in the firehouse; and
- Our FDOC can push out situational awareness to members about in-progress events where they might be called to respond.

FDNY has the most comprehensive fire fighter training program in the country, consisting of classroom learning, hands-on skills development and training in state-of-the-art simulated environments including a high-rise building, subway cars and tunnels. We know that e-learning will never fully replace classroom or practical skills training, but it has become an important component of the training cycle we provide for our members. Fire departments from around the country are interested in leveraging our e-training content. This information sharing is a core value of the FDNY, and we are evaluating the feasibility of offering our kiosk training to other departments.

THE CENTER FOR TERRORISM AND DISASTER PREPAREDNESS

Making consistent progress on the wide array of initiatives I have just described requires careful planning. We created the Center for Terrorism and Disaster Preparedness (CTDP) in 2004 to be the focal point for the Department's strategic preparedness, providing the Department with the necessary intelligence to make critical decisions in dangerous environments beyond more routine responses.

The Center's activities bring together our own members' varied expertise to create a dynamic and practical approach to counterterrorism, disaster response, and consequence management. CTDP bridges the divide between the established intel-

ligence community and non-traditional intelligence consumers and producers, such as the fire service.

CTDP has also helped develop new technologies such as the Electronic Command Board (ECB), which I mentioned earlier. The Department piloted the ECB and its hand-held, tablet-style Command Pad this past spring. ECB is used to account for deployed units and will be connected to FDOC to send digital blueprints and other building information to the fireground. It can also be used in subway emergencies to provide Incident Commanders with information on tunnels and emergency exits. It will also receive mayday signals from Electronic Fireground Accountability System.

One of the functions of CTDP is to develop tabletop and full-scale exercises to test procedures and core capabilities of the Department. Continual training exercises better prepares our first responders to use technology at routine and major events.

FUTURE PREPAREDNESS ENHANCEMENTS

Building on the achievements I have just listed, we set an ambitious agenda for future preparedness enhancements.

One significant development is the implementation of the Electronic Fireground Accountability System (EFAS), just mentioned. The EFAS pilot was launched in December 2010 to improve the on-scene accountability of members at fires and other emergencies, including large-scale high-rise or subway incidents. With EFAS, an officer's laptop identifies and assigns a position for all fire company members. Now fully integrated, EFAS will monitor handie-talkie transmissions and mayday alerts and allow the Incident Commander to perform an Electronic Roll Call.

Grants

In the area of Federal grants in general, we do have some concerns going forward. We know that FEMA plans sweeping changes for the fiscal year 2013 Homeland Security grant cycle. First and foremost, the Urban Areas Security Initiative needs to be preserved as a stand-alone program that is well-funded and targets assistance to those areas identified as most at-risk for terrorism.

With funding expected to decrease Nation-wide, it is more imperative than ever that FEMA direct funds based on where intelligence and threat analysis tell us they are most needed. Now is not the time to cut funding to New York City, which remains the No. 1 high-value target for terrorists.

We are also concerned about the compressed time lines being instituted for homeland security grants. The proposed 24-month grant cycle, with very limited exceptions, is short-sighted. Some of the FDNY's most successful and powerful DHS-funded assets, such as our fireboats and our FDOC, took years to build and implement. We need flexibility so that we can continue to develop the complex systems and assets that, although they may have relatively long time lines for implementation, have equally far-reaching and impactful results.

Our goal is not to spend funds quickly, but to use Federal resources efficiently and well to advance preparedness for New York City and the Nation. We will continue to encourage DHS to be flexible and work with us to achieve that mission.

SIGNIFICANT RESPONSES

Last, I would like to mention two key incidents from the last few years where many of the technological advancements I have just described came into play, with great outcomes: Flight 1549's emergency landing in the Hudson River in January 2009, and the May 2010 terrorist incident in Times Square.

Flight 1549's landing is a noteworthy example of networked command in action: The FDNY Fire and EMS Operations, the NYPD, and the U.S. Coast Guard all worked together, connecting at the scene through a unified command structure under the National Incident Management (NIMS) protocol. We were able to connect back to the FDOC at headquarters while the Fire Marshals connected with LaGuardia Operations to obtain the flight manifest. EMS connected with the broader EMS system—including hospitals in New Jersey—to track all of the transported patients. Ultimately, the FDNY was able to confirm that all the passengers were accounted for. We then posted this information on the Homeland Security Information Network, which was shared with our partner agencies, and ultimately that good news made its way to the Situation Room at the White House. In sum, we had to hastily form an effective, new-generation network where human and technological networks played a key role in instant information sharing and analysis.

In May 2010, Faisal Shazad attempted to detonate a car bomb in Times Square. Engine 54 and Ladder 4—companies that lost their entire crews on 9/11—were called to the scene for a car fire. Before 9/11, a fire officer's first instinct may have

been to get up close to the car and use water to extinguish the fire. But these first responders recognized that this was no ordinary car fire. And, because of their increased situational awareness and dedicated training, they immediately realized that they had a potential terrorist threat on their hands. They knew exactly what to do: They started clearing the area and called the NYPD bomb squad. They also knew what NOT to do: They did not disrupt the vehicle and did not attempt to put out the fire. Their actions kept bystanders safe and also preserved crucial evidence that lead to a quick capture of the suspect.

I am proud of our members' critical role in these two incidents, but the truth is we respond to incidents on a daily basis that require a "new-generation" response. While our rebuilding is never finished, I can say without equivocation that this Department is better prepared, equipped, and trained and more capable than ever before.

CONCLUSION

In conclusion, to quote New York City's Fire Commissioner, Salvatore Cassano, "the greatest way to honor those we lost on 9/11 is to make sure that we are prepared for the next event." We are prepared for the next event, and the process of continuing these preparedness efforts carries on. Our partnership with DHS and the support of the Members of Congress have been absolutely critical to these efforts. Importantly, all of the technological advancements I have described can potentially become part of a Nation-wide, integrated system of response information that benefits first responders in every jurisdiction in the country.

I would be happy to answer any questions you may have.

Mr. BILIRAKIS. Thank you, Chief. Ms. Doying, you are recognized for 5 minutes.

STATEMENT OF ANNETTE DOYING, DIRECTOR, OFFICE OF EMERGENCY MANAGEMENT, PASCO COUNTY, FLORIDA

Ms. DOYING. Chairman Bilirakis, Ranking Members Richardson and Clarke, other Members of the subcommittee, I appreciate you allowing me to testify here today before you on your first responder technologies hearing. The subject matter, trying to accomplish a prioritized ranking scheme for funding, resonates very directly with me and I hope that my testimony assists you with that today.

When I first came on board to work as the Homeland Security Coordinator in Pasco County, Florida, science and technology was a DHS element that I was quite excited about. Over the course of more than 6 years, I taught approximately 4,000 first responders Homeland Security-related concepts of operation.

I would tell the students a story that started something like this. Do you remember the fellow who died of anthrax exposure in October 2001? He worked at the National Inquirer building in Palm Beach County. I want you to imagine that you are the local hazmat responder and you have been asked to enter that building, find, contain, and remove the anthrax from that building. As you don your low-bid SCBA, as you don your low-bid protective ensemble, and as you strap on your low-bid protective device, how do you feel about being the guy going in that building?

I would go on to talk in these classes about how the DHS Science and Technology Directorate was intended in part to bring cutting-edge technology being developed in private sector and university R&D labs to those agencies that have responsibility for responding to WMD CBRNE events. I shared my opinion that the future held for us the idea that the choice of low-bid-only equipment would be countered by the science behind the why we need this device or equipment justification. I held out hope that our local hazardous materials responders would don TPE and use devices that would

be of a proven quality, proven to Government through Government, instead of by a corporate salesman who we can't point to and swear that he has our best interests in mind.

Today, I hesitate to share that message, because my observations of how science and technology has trickled down to local communities shows me some disparities between what I had hoped for and what is. An example I offer is a very limited local perspective on the work of the domestic nuclear detection office. This program seems to have worked diligently to ensure that communities are protected from a radiological or a nuclear incident. As a result, local law enforcement officers have been recipients of personal radiation detector devices and hospital entryways are outfitted with NC2 detectors. But not enough law enforcement officers have these devices. Certainly, the first-in officer doesn't have one.

For those hospitals that have these devices, not enough integrated planning with local health departments and first responders has been accomplished. At the local level, there is little understanding of how to access technical reach-back capabilities to support an incident of this type, and so there will be losses.

The consolidation by the Science and Technology Directorate of the multiple standards that apply to Homeland Security is a successful and useful effort. NFPA 1981 and NFPA 1994 standards of self-contained breathing apparatus and protective ensembles are key and critical components of a Nation-wide homeland security program. Their focus on protection of first responders is of an importance that is well understood by all of us here today. Continued focus on modernizing these standards, promoting the use of emerging technologies and support of the response community, and leveraging the knowledge found in R&D labs is our first line of defense for local responders.

In the last 10 years, I have seen a significant amount of confusion about where homeland security funds should be spent. I have heard the arguments that ask how equipment fits into the context of capability building and risk reduction. Equipment, the right equipment, well trained on, is an important tool for the first responder.

I have observed the gains made within the area of training for the National Domestic Preparedness Consortium facilities. I find that resident training at these facilities is more effective than attempts to provide the same training within local communities. A significant effort to promote first responder participation and educate local communities about the value of this training would further the agenda that asks us to standardize our approach towards emergency response.

There is considerable logic for concentrating funding in high-risk communities. However, the designation of jurisdictions-specific specialty team means that single jurisdictions have been well-equipped and trained with the use of homeland security funds. For those of us serving on the fringe of those high-risk communities, this funding methodology has produced some sense of detachment to the homeland security mission. There should be a more networked approach to capability building, one that disregards jurisdiction, supports multi-agency response, and acknowledges that it is through mutual aid that all disasters are best served.

In nearly all of the communities that surround me, I see emergency managers, fire fighters, and law enforcement officers struggling with Homeland Security as an "other duty as assigned." For the local first response community, this is a deficit. You should know that without dedicated Homeland Security personnel at the local level, much of the work being done on a National scale is hidden from view and, therefore, largely disregarded.

Thank you for offering me the time to speak to you today.

[The statement of Ms. Doying follows:]

PREPARED STATEMENT OF ANNETTE DOYING

MAY 9, 2012

Members of the committee, thank you for the invitation to testify today in your joint hearing on first responder technologies. Your focus on ensuring a prioritized approach for Homeland Security Research and Development resonates with me and I hope that my testimony assists you towards that end.

I realize that this committee has probably seen some very tangible work accomplished by the universities and private sector institutes funded through the Science and Technology Directorate. Through conversations with my new-hires, guys who worked CBRNE in the Air Force and Army up until a few months ago, I understand that the Department of Defense saw an increase in the quality and quantity of Personal Protective Equipment and response equipment over the last 10 years. They also experienced strengthened relationships with Research & Development entities and labs that support testing and analysis. I also know that the placement of the very competent and well-equipped WMD–CSTs (civilian support teams) in local communities was a positive forward movement in support of local response. The experiences of Federal representatives working with and within the S&T Directorate, members of the military, and the faculty at funded universities and staff of National labs is not the experience of local responders. My perspective is limited to the outcomes of homeland security initiatives at the local level.

In the realm of emergency preparedness gains have been made within the area of training through the National Domestic Preparedness Consortium facilities like the Center for Domestic Preparedness at Ft. McClellan in Anniston, AL, the Energetic Materials Research and Testing Center at New Mexico Tech, the National Center for Biomedical Research and Training at Louisiana State University, and the Texas Engineering Extension Service. This training has become a cornerstone of common knowledge building for the local response community. I've seen the consortium grow and I've watched as more and more local folk become aware of the training opportunities offered through it. I've personally put SHSGP funds to good use to support training of local responders through the consortium and I've seen other local governments do the same. I find that resident training at these facilities is more effective than attempts to provide the same training through mobile delivery within local communities. Support for local responders to attend training at Consortium facilities should be the emphasis for future capability building. A significant effort to promoting participation and educate local communities about the value of this training would further the agenda that asks us to standardize our approach towards emergency response. Careful oversight that focuses on the quality of instruction and gauging the depth of knowledge built through consortium training will help justify the need to have local responders leave their own communities for this training.

A few weeks ago, Sheriff Chris Nocco, Pasco County, Florida provided testimony before this or a similar body. Sheriff Nocco spoke about a number of things but I would like to speak to one of these as well. The Sheriff conveyed his understanding of State and Federal designation of regional specialty response teams and his concerns about the use of these teams in a community which must then rely on the skills and equipment of those teams. Designation of a regional team really means that single jurisdictions "own" a team that will be eligible for Federal homeland security planning, training, exercise, and equipment funds. There is considerable logic for concentrating funding in high-risk communities and expecting that those communities build a capability for managing those risks. However, for those of us living in and serving communities on the fringe of those high-risk communities this funding methodology has produced some sense of detachment to the homeland security mission. If you aren't empowered to make decisions about the application of homeland security funds, then how do you contribute to the mission? Further, the expec-

tation that those specialty teams will serve outlying communities through mutual aid is reasonable, but this approach to building capability fails to recognize that mutual aid works in two directions. There should be a more networked approach to capability building; one that disregards jurisdiction, supports multi-agency response, and acknowledges that it is through mutual aid that all disasters are best served.

At the State and local level I've seen a significant amount of confusion about where local State Homeland Security Grant Program funds set aside for planning, training, and exercise should and could be spent. I've understood the struggles and arguments that local, regional, State, and Federal players have when trying to determine how equipment fits into the context of capability building and risk reduction. We've all felt the consternation over the debate about sustainment funding for equipment upkeep. I, and my community, have been fortunate in that from 2005 until 2011 I filled a Homeland Security Coordinator position created by my local jurisdiction and initially funded through the State Homeland Security Grant Program (SSGP). This obligation of funds towards a dedicated full-time emergency manager focused on local implementation of homeland security initiatives is what enabled my understanding of the things I'm speaking to you about today. But in nearly all of the communities that surround me, I look and don't see a counterpart. Instead, I see emergency managers, fire fighters, and law enforcement officers struggling with an other-duty, as-assigned. For the local first response community, this is a deficit. Without dedicated homeland security personnel at the local level, much of the work being done on a National scale is hidden from view and, therefore, largely disregarded.

The consolidation, by the Science and Technology Directorate, of the multiple standards that apply to homeland security is a successful and useful effort. NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs should be well understood and implemented by local government. Beyond the standard, however, there should be stronger mechanisms for ensuring that disasters are well managed, business can continue, and local civil servants know their role. Other standards, such as NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services which requires all SCBA gear to adhere to certifications that provide respiratory protection against chemical, biological, radiological, and nuclear attacks and NFPA 1994, which specifies the minimum requirements for protective ensembles for fire and emergency services personnel operating at domestic terrorism incidents (chemical/biological) are key and critical components of a Nation-wide homeland security program. Their focus on the protection of first responders is of an importance that is well understood by all of us here today. Continued focus on modernizing these standards, promoting the use of emerging technologies in support of the response community, and leveraging the knowledge found in research and development labs in the private sector and universities is our first line of defense for our local responders.

When I first came on board to work homeland security in Pasco County, Florida, this was a DHS element that I was quite excited about. Over the course of more than 6 years, I taught approximately 4,000 local first-responders homeland security related concepts of operation. I would always tell a story that started something like this: "Do you all remember the fellow who died from Anthrax exposure in Palm Beach County in October 2001—he worked at the National Enquirer building? Well, imagine that you are the hazmat responder from local government who is asked to go into that building, find (detect) the anthrax, collect and package it, and transport it out of the building. As you don your low-bid SCBA and your low-bid protective suit, and you strap the low-bid detection device around you, how do you feel about being the guy going in?"

I would go on to talk about how the DHS Science and Technology Directorate was intended, in part, to bring cutting-edge technology being developed in R&D labs in the private sector and in the great universities across our Nation to those agencies inside of government that have responsibility for responding to WMD/CBRNE events. I shared my opinion that the future held for us the idea that the choice of low-bid only would be countered by the science behind the why-we-need-THIS device/equipment/supplies justification. I would go on to state that I held out hope that our local hazardous materials responder would don PPE and use devices that would be of a proven quality—proven TO Government THROUGH Government instead of by a corporate salesman who we can't point to and swear that he has our best interests in mind.

Today, I hesitate to share that message because my observation of how science and technology has trickled down to local communities shows me some disparities between what I had hoped for and what is. In example, I offer a limited local perspective on the work of the Domestic Nuclear Detection Office (DNDO). This program seems to have worked diligently to ensure that communities are protected

from a radiological/nuclear incident. As a result, local law enforcement officers have been the recipients of personal radiation detector devices and hospital entryways are outfitted with in situ detection devices. But, not enough law enforcement officers have these devices. Certainly, the first-in officer doesn't have one. Not enough hospitals have these devices and for those that do, not enough integrated planning with local health departments and first responders has been accomplished. At the local level, there is little to no understanding of how to access technical reachback capabilities. And so there will be losses if we find ourselves responding to a radiological or nuclear incident. I could offer other examples of how a good program hasn't gone far enough to reach local communities.

Outside of the purview of domestic security, other hazards exist. Recently, the National Emergency Management Association (NEMA) articulated its position on the National Hurricane Program to the Federal Emergency Management Agency. I'm familiar with their recommendations and wanted to take this opportunity to communicate my support of a few of their key concepts as it relates to Emergency Preparedness. NEMA suggests that the FEMA and the U.S. Army Corps of Engineers conduct an analysis of government user's needs to ensure that the software application HURREVAC remains the best tool for use by emergency managers in their evacuation decision making. This recommendation asks that these agencies consider current and emerging technologies and the resource requirements for maintaining and modernizing HURREVAC. This is a reasonable request and reflects the customer-service-oriented approach that should be the underpinnings of any emergency preparedness work. NEMA also shared their recommendations related to a continued focus on private sector outreach and the need to focus efforts on sharing FEMA products with the private sector. This is a balanced and reasonable recommendation and is conducive to efforts being made within local and State governments. Finally, NEMA's recommendation related to leveraging academic institutions applies not only to hurricane preparedness but to the entire realm of emergency preparedness. Federal support for building collaboration between local communities can promote the application of education and experience to disaster management in all phases.

Thank you for providing me with the opportunity to share the local perspective on first responder technologies. Your focus on a prioritized approach to homeland security research and development is strongly appreciated by the citizens and civil servants of our great Nation. I personally appreciate the effort you are making here today on behalf of Pasco County's first responders and all of the dedicated first responders who serve in times of disaster.

Mr. BILIRAKIS. Thank you, Ms. Doying. Ms. Coon, you are recognized to testify for 5 minutes.

STATEMENT OF KIERSTEN TODT COON, PRESIDENT AND CEO, LIBERTY GROUP VENTURES

Ms. COON. Thank you. Good morning. Good morning, Chairman Bilirakis, Ranking Members Richardson and Clarke, and Members of the subcommittee. Thank you for allowing me to testify in front of you today.

As you have heard about, I think the most relevant component to it is that I served on the Senate Committee on Governmental Affairs after 9/11 and was part of the team that drafted the Science and Technology Directorate. I have spent most of my career in public service. In the private sector, I continue to do that by working with strictly public-sector clients on crisis management.

My focus, rather working in Government or outside of it, has been how to bring solutions to the local level and how to make the lessons learned at the Federal level and the best practice accessible to those who are responsible for implementing them every day.

In the context of this hearing, I would like to highlight one primary issue, a key challenge, and a proposed solution. This issue is how can we translate the technologies and the tools that are working in one jurisdiction at the local level to other jurisdictions near and far across the country. Communities, particularly since 9/11, have done an exceptional job of finding the resources to address

their local issues, as hard as that may have been, whether it is interoperability among first responders or access to public and private resources during the response and recovery phases of a crisis.

The challenge lies in the Federal Government, either through DHS or FEMA, needing to have a structure in place to survey Nationally what is working across the country, sharing those best practices and the lessons learned at the local level with other jurisdictions around the country, so we are not forced to reinvent the wheel around the Nation. As we look at a solution, DHS through S&T and FEMA need to connect to localities, perhaps through the FEMA field and regional offices to find out what is working. Use those Federal resources, rather than putting the burden on the local level to find those resources to share technologies, to take these best practices, the effective technologies and the tools Nationally, so each jurisdiction doesn't have to go through the similar trial-and-error experiences.

DHS should develop a methodology for using the successful technologies and tools that are working regionally and building as a template from which other can build. It is important to note that this template idea that we have looked at the local level is not a one-size-fits-all approach. Any of us who have worked at the local level know you can't impose one of those structures on them, but it is taking it as a foundation upon which jurisdictions can build and customize their needs and resources.

I want to offer a case study that I have worked over the last 3 years, which is the Arlington Office of Emergency Management. In various capacities, I have had the privilege of working with them, led by Jack Brown and Charlotte Franklin, and I commend Dr. Griffin for making the move to take somebody—Charlotte Franklin was working in economic development—and bring her to crisis management. She has been tremendously successful and she owes a lot of that to Dr. Griffin and through the support of the Northern Virginia Emergency Response System.

Arlington has focused on the role of the private sector in disaster preparedness, response, and recovery, but not in the traditional sense. The county has not recycled the overused term "public-private partnership." It has turned that phrase on its head by asking the private sector: What does it need from the public sector to do its job?

If we look at our understanding of the role of the private sector since 9/11, we can look at three phrases: 9/11—we were concerned if there were enough resources to respond and recover. When we had Katrina, we understood that the public sector and the private sector had the resources, but we failed in matching the needs with the resources. What we now understand is that this is not an inventory discussion. It is not: Do we have them? Will the private sector donate it? The private sector will donate it. The challenge is the supply chain management. So how can the public sector work with that—work with the private sector in facilitating supply chains to work effectively?

Arlington County has taken on this issue in a multi-phase project, which began in January 2011. After convening a forum with representatives both Nationally and locally from the private, public, and nonprofit sectors, the county, through a DHS grant and

support from NVERS, developed a web-based portal that enables citizens to identify where they can donate goods and where they can receive assistance. I am happy to go into greater detail about the portal, but the lessons here revolve around what has happened since this portal was developed with Federal money.

Arlington learned through other grants and other regions nearby—they have learned that other regions have developed similar technologies. Florida and Louisiana both have a similar web-based system. What is noteworthy is that it appears that all of these were developed with Government funding, but with limited knowledge of each other. What is also important to understand is that one of the jurisdictions that developed this money through Federal funding offered to sell the platform to another's jurisdiction 400 miles away for $50,000.

The inefficiency of the system is obvious. Arlington works under the premise that anything it has developed or discovered through Federal monies should be shared without cost. It is trying to put the portal on a platform that can be shared Nationally and shared with other jurisdictions. I do want to highlight that the S&T monies that were used for one of these portal-based programs, it was S&T money that funded that and S&T monies were also applied successfully to a risk management assistance program in Arlington.

The case study highlights that DHS should have the knowledge in both directions of how its monies are being spent. Through my experience at the Federal, State, and local levels, the other key issues in this context that are worth noting are the fact that when S&T develops technologies, it needs to ensure that it has the input of those who will be using them. Similarly, first responders need to have a formal voice, a liaison, or an advocate to DHS and FEMA. Over the past few years, first responders have become more empowered to develop strategic initiatives for themselves. They know better than anyone that crises do not stop at borders and they are working hard to integrate those capabilities across lines.

As we examine ways to improve current capabilities, we need to focus on increasing the outreach between first responders and S&T, increasing the connection and communication between those who are developing technologies and those who will be using them. Additionally, this process should not always move in one direction. We also need to examine how to distribute the information that is collected at the State and Federal level, FEMA's information, to the people who need them in a time of crisis. We should inventory the existing organizations and outreach mechanisms that exist in the Federal Government. As we explore ways to improve current processes, we understand that it is not always about creating new and novel, but often about enriching and supplementing what exists.

In conclusion, as a country, we rely on our first responders every day for disruptions, crises, and disasters of all kinds. One of the key intentions of the creation of the Science and Technology Directorate within the Department of Homeland Security was to enable the Nation's top scientific minds to develop cutting-edge technologies and tools to help our first responders do their jobs. A key factor to this success is the frequent communication and relationship between them.

We can get caught up in the jargon and technical terms, but at the end of the day, we need to ask what is needed, how it will be used, and who can develop it. The input from first responders is critical. We need to be thoughtful and deliberate in how we evaluate the needs of first responders, and identify and develop technologies that ensure we are being as effective as we can in creating prepared and resilient communities. Because through the aggregation of small communities, we create a strong Nation.

Thank you for the opportunity to testify before you today, and I look forward to your questions.

[The statement of Ms. Coon follows:]

PREPARED STATEMENT OF KIERSTEN TODT COON

MAY 9, 2012

INTRODUCTION

Good morning Chairmen Bilirakis and Lungren and Ranking Members Richardson and Clarke. It is a pleasure to testify before you today on the Department of Homeland Security's Office of Science and Technology's process to develop technologies that support the needs of first responders. I am currently President and CEO of Liberty Group Ventures, LLC and work with State and local governments, as well as corporations, colleges, and universities, on cybersecurity, crisis management, response, recovery, and community resiliency.

BACKGROUND

Prior to LGV, I was a partner at Good Harbor Consulting—and developed its North American crisis management practice. In this capacity, I built teams of small businesses, typically run by individuals who had had leadership roles in government, to address critical infrastructure protection and crisis management challenges at the State and local level. The agility and efficiency of these teams proved to be effective in assessing what was needed at the State level and helping to translate lessons learned to the Federal level.

Before Good Harbor Consulting, I worked for Business Executives for National Security (BENS) and focused on the role of the private sector in disaster preparedness and response, as well as examining the role of cybersecurity in crisis management. I spent time consulting for the California Governor's office on homeland security and also served as a Professional Staff Member on the U.S. Senate Committee on Governmental Affairs (now the Committee on Homeland Security and Governmental Affairs); I was on the team that drafted the infrastructure protection, emergency preparedness, and science and technology directorates of the legislation that created the Department of Homeland Security. I also worked in the White House domestic policy office and the Office of National Drug Control Policy.

My focus, whether working in government, or outside of it, has been how to bring solutions to the local level and how to make the lessons learned at the Federal level accessible to those who are responsible for implementing them every day. In the context of this hearing, I would like to highlight one primary issue, its key challenge, and a proposed solution.

ISSUE/CHALLENGE/SOLUTION

Issue.—How can we translate technologies, tools, etc. that are working in one jurisdiction, at the local level, to other jurisdictions, near and far?

Communities, particularly since 9/11, have done an exceptional job finding the resources to address their local issues—whether it is interoperability among first responders or access to public and private resources during the response and recovery phases of a crisis.

Challenge.—The Federal Government, either through DHS or FEMA, should have a structure in place to survey what is working, across the country, and share best practices, lessons learned, at the local level with other jurisdictions around the country.

Solution.—DHS, through S&T, and FEMA, needs to connect to localities—perhaps through the FEMA field and regional offices—to find out what is working and then use Federal resources (do not put the burden on the local level to find the resources to share technologies) to take best practices, effective technologies and tools, Nation-

ally, so each jurisdiction doesn't have to go through similar trial-and-error experiences and reinvent the wheel to get to the same solution. DHS should develop a methodology for using successful technologies and tools that are working regionally and/or locally, as a template from which others can build. It is important to note that the template is not a one-size-fits-all approach, but rather a foundation upon which jurisdictions can build and customize to their needs and resources.

CASE STUDY—ARLINGTON OFFICE OF EMERGENCY MANAGEMENT

In various capacities over the past 3 years, I have had the privilege to work with the Arlington County Office of Emergency Management, led by Jack Brown and Charlotte Franklin. Arlington has focused on the role of the private sector in disaster preparedness, response, and recovery—but not in the traditional sense. The county has not recycled the over-used and now somewhat meaningless term, "public/private partnership." The county has turned that phrase on its head by asking the private sector what it needs from the public sector to do its job. If we look at our understanding of the role of the private sector since 9/11, we can divide it into three phases:

- *Phase I*.—Immediately following 9/11, we were concerned if there were enough resources to help respond and recover.
- *Phase II*.—During Katrina, we learned that inventory was not the issue and the primary concern, which was quickly assuaged, was whether the private sector would be willing to donate the inventory. The primary challenge then became how do we, logistically and legally, get the resources to where they are needed—and, what is the Government's role in facilitating the movement of goods it does not own.
- *Phase III*.—We now understand the public/private partnership issue to be supply chain management-based. We know there is enough inventory, and we know the private sector is philanthropic and benevolent and will donate whatever is needed in a crisis. But, what we haven't figured out is how to ensure supply chain management can operate as effectively and efficiently in a crisis state as it does in an emergency state.

Arlington County has taken on this issue in a multi-phase project, which began in January 2011. After convening a Forum with representatives, Nationally and locally, from the private, public, and non-profit sectors, Arlington, through a DHS grant and support from the Northern Virginia Emergency Response System (NVERS), developed a web-based portal that enables citizens to identify where they can donate goods and where they can receive assistance. I am happy to go in to greater detail about the portal, but the key lesson here is what has happened since the portal was developed. Arlington has learned that through other grants, Washington, DC and Fairfax County have each developed a related technology. It has also learned that Florida and Louisiana have developed a similar web-based system. What is remarkable is that it appears that all of these were developed with Government funding, and with limited, if any knowledge, of the others. What is also important to note is that one of the jurisdictions that has developed this technology offered to sell the platform to another jurisdiction 400 miles away for $50,000. The inefficiency of this system is obvious. Arlington works under the premise that anything that it has developed or discovered through Federal monies should be shared without cost and is trying to put the portal on a platform that could be shared, Nationally.

This case study highlights the fact that DHS/FEMA/S&T need to understand how its monies are being spent and how to take the successes of those grants to other parts of the country.

Through my experience at the Federal, State, and local level, the other key issues in this context that are worth noting are:

- When S&T develops technologies, it needs to ensure that it has the input of those who will be using them. Similarly, first responders need to have a formal voice, a liaison, or advocate to DHS and FEMA.
- Over the past few years, first responders have become more empowered to develop strategic initiatives for themselves—and they recognize the need for and importance of key issues, such as interoperability of equipment and collaboration across jurisdictional boundaries. First responders know better than anyone that crises do not stop at borders—and they are working hard to integrate capabilities across jurisdictional lines.

As we examine ways to improve current capabilities, we need to focus on:

- Increasing the outreach between first responders and S&T—increasing the connection, communication between those who are developing technologies and those who will be using them. Additionally, this process should not always move

in one direction—there are cases where new technologies are developed in response to needs, as well as scientific discovery; and, there are cases where needs directly inform what technology should be built.

- We must inventory the existing organizations and outreach mechanisms that exist between S&T, FEMA, DHS, and first responders and identify the most effective and efficient ways to utilize them. As we explore ways to improve current processes, we understand it is not always about creating new and novel, but often it is about enriching and supplementing what exists and making it more accessible.

CONCLUSION

As a country, we rely on our first responders every day for disruptions, crises, and disasters of all kinds. One of the key intentions of the creation of the Science and Technology Directorate within the Department of Homeland Security was to enable the Nation's top scientific minds to develop cutting-edge technologies and tools to help our first responders do their jobs. A key factor to the success of this idea is the frequent communication and strong relationship between those who are developing the tools and those who are using them. We can get caught up in jargon and technical terms, but, at the end of the day, we need to ask what is needed, how will it be used, and who can develop it. All of the necessary pieces exist—it is now our responsibility to figure out how to complete the puzzle.

Thank you for the opportunity to testify before you today. I look forward to answering any questions.

Mr. BILIRAKIS. Thank you, Ms. Coon. I want to thank the panel for your excellent testimony—very informative. Now, I would like to recognize myself for questions. I recognize myself for 5 minutes.

I want to begin with Dr. Griffin. Dr. Griffin, since December 2010, when your First Responder Group was established, you have developed the Solution Development Process. This process is designed to pull first responders from around the Nation into S&T's methodology for developing resource priorities. Can you tell me how this works exactly? How do you choose the first responders to participate? Is it done by survey or do you get together in a physical location once or more a year? Then I have a follow-up. Please, sir.

Mr. GRIFFIN. Thank you, Mr. Chairman. As we thought through our requirements gathering process, one of the things I have tried to do is build off the existing IPT process that was in place, but I wanted to work to better identify operational gaps and find a way to clearly prioritize programmatic areas. So one of the first things I did was I partnered with FEMA and we developed Project Responder as a mechanism to both identify operational gaps from first responders across the country and then to use that as a mechanism to prioritize areas that we were going to put funding in, recognizing that I don't have enough money to fund all of the needs of the first responder community. So it also provides us a structure that we could use to create priorities.

What I also then did is I brought in other workgroups, like the IAB, InterAgency Board, spoke with professional associations, looked at what was going on in regional workgroups in order to cross-validate our priorities and needs. As we look at our first responder outreach effort, I try to do a couple of things. I try to make sure that we are balancing our groups with not only folks from high-risk urban areas, but also suburban and rural areas. I try to make sure that we are balancing our first responder outreach to include all of the demographics of the country, thinking about communities that are both affluent and less affluent. I am also trying to balance our groups so that we have a fair cross-section of all of

the functions, so that we have law enforcement and emergency medical services and fire and emergency management, and other first responder entities equally balanced to make sure that we are thinking cross-functionally as we develop our set of requirements.

What we have been doing is that we have been bringing the committees together once a year and then using video conference and teleconferences in order to then build sets of requirements off of our prioritized lists.

Mr. BILIRAKIS. Thank you. For the first responders on the panel, how many of you have been asked to participate in S&T? Then how many have you? Anyone here been asked to participate in S&T?

Chief KILDUFF. Yes, sir. We have participated with S&T on a number of different projects. In fact, Dr. Griffin was up with us 2 weeks ago, as we ran an exercise with a class of West Point cadets, looking to build out a network of communication and information sharing that they could use in their exercise. Then Dr. Griffin basically takes that back to his groups and sees if he can develop that network communication program, something that is very important to us. So we want to stay—keep close ties with Dr. Griffin and the Directorate.

We also have a member that is dedicated to a couple of Dr. Griffin's project staffs that, although he was not there full-time, he has a full-time participant is a few committees, mostly to do with detection equipment and hazmat management. We have found the Directorate to be very responsive to what our needs are and has always basically led whatever we need—has always led the committees in that direction, obviously for the benefit of the entire first responder community, but has always been very responsive to us and our needs.

Mr. BILIRAKIS. Very good. Anyone else on the panel who has participated?

Okay. Question for Ms. Doying. Capitol Hill and the State of Florida are two places where the memory of the anthrax—I know you address this a little bit in your testimony, but the memory is so very strong of the anthrax attacks of 2001. Those attacks drove most of the work in biodefense this Nation has undertaken in the last decade, including development of improved protective and detective equipment for first responders.

You said in a course, that you taught this course for 6 years, you used to ask your first responders how they feel about going into an anthrax-laden building to provide response. What was their response then? Then how would you think they would feel now? Is the equipment needed to do that work both available and affordable to you? Very important.

Ms. DOYING. Thank you.

Mr. BILIRAKIS. You are recognized.

Ms. DOYING. Yes. At the time, as I would teach that class and I would relate that story, all of the fire fighters and law enforcement officers and EMTs in the room, they would laugh, because the low-bid approach in local government to purchasing technology is a long-standing custom. As we have moved forward over the last 10 years, what I do know is that those first responders from my community and the communities that surround me that have participated in the consortium training using the right tools, learning

the methodologies for approaching a chemical or biological incident, they have gained a lot of confidence in the Nation's ability to respond to those events.

I also know that within fire service, the advancements with SCBA, for example, to be more protective for a chemical or biological incident and other safety features that have moved forward into the PPE realm, have also increased the confidence of the local first responder.

Mr. BILIRAKIS. Okay, so is the equipment available. Second, is it affordable in your opinion?

Ms. DOYING. It is available. Affordable in a highly-focused way. Not available to the n'th degree. You know, you have to concentrate who you are going to suitably protect and, therefore, who you are going to not only gear up physically, but gear up mentally to be the first line of defense for a specific type of incident.

Mr. BILIRAKIS. Thank you very much. Now I recognize Ms. Richardson for 5 minutes.

Ms. RICHARDSON. Yes. Thank you, Mr. Chairman.

Chief, would you tell us if you agree or disagree with the assessments that Ms. Coon made?

Chief KILDUFF. I think that Ms. Coon made some very valuable assessments when it comes to how a local picture can be translated to a more National picture. I think that a lot needs to be done by connecting communities, by connecting people that have the ability to sponsor equipment, test equipment, and then train and equip members that are out in the first responder community. It is a step-by-step process that is underway but has quite a few gaps when it comes to coordination when it comes to coordination and also when it comes to funding.

So I think what Arlington does is admirable and they are leaders in a lot of these first responder communities. They do have a very heads-up—it is an integral group that is very attuned to National security, homeland security, first responder preparedness, and they are a good demonstration for that. But it all has to be applied at a National level and that is really I think where this should be headed.

Ms. RICHARDSON. Dr. Griffin, are you aware of the concerns that both the Chief and now Ms. Coon have expressed?

Mr. GRIFFIN. I am, Ma'am. It is one of the areas that we are looking to address because I think it is a great opportunity for us. One of the values that I believe my group can bring is by connecting first responders around the country. I understand that there are limitations and a direct correlation between what works in Arlington County versus what may work in Seattle, but at the same time, there is great work being done at the local government that we can link together.

So as we think about some of our tools—like firstresponder.gov or our first response community of practice, which actually allows first responders to get on our sites and safely chat with each other about what is working and not working—are tools that we look at as, in part, trying to begin the process of addressing the concerns that were raised in testimony.

Ms. RICHARDSON. Excuse me. Ms. Coon, could you share with Dr. Griffin why those systems do or do not work?

Ms. COON. The system to translate what is working at the local level, Nationally?

Ms. RICHARDSON. Right, and communicating that. He just referenced firstresponder.gov and some other things.

Ms. COON. So I think it is taking—what you want us to encourage the local levels to be innovative and to take on the money to do something that is sort of pushing, as Ms. Doying talked about, the cutting-edge technologies. I am not—I don't know that they are not working.

What I do know is that, in the experiences that I have had, taking something efficiently that is working at the local level and trying to work through the Federal Government to get it out there, is a little bit of a cumbersome process. But I do want to say that I am not—I don't know that those particular mechanisms are not working. They just have not been accessible to the projects that I have been working with.

Ms. RICHARDSON. Okay. So Dr. Griffin, are you hearing their concern?

Mr. GRIFFIN. Yes, I am.

Ms. RICHARDSON. Can you get back to the committee on what you can do to address the concerns that have been addressed by the folks here who have testified?

Mr. GRIFFIN. Absolutely.

Ms. RICHARDSON. My first question has to do with—Dr. Griffin, being here on the committee now myself for a couple of years, quite a lot of money has been expended for these various programs. What are you going to do to make sure that the first responders are spending their limited funds on equipment that is actually necessary and that works? I think it builds upon my initial first questions that I just asked.

Mr. GRIFFIN. Part of the challenge, as I tried to address, is that there is not a single set of requirements that are going to meet the needs of 80,000 first responders. So as we develop technologies, we recognize that we have to continue to work with first responders through our entire process, so that we work through what we call a spiral development process. As we develop technologies, they are an integral part of redefining and continuing to define equipment that we are trying to bring to market.

Ms. RICHARDSON. Dr. Griffin, if you don't know, we certainly can't expect them to know. I served in local government and I am familiar with—for example, the Chief, is from a very large city—like, for example, Los Angeles or Long Beach. The city of Long Beach—I was on the City Council—it is one of the top—I think it is the 33rd city in the State of California. So there are larger cities. There are medium-size cities. Then there are smaller cities.

So what is precluding the Department from coming up—obviously, every Department is different. However, we don't have time to have every single city create their own process. So what is precluding your Department from creating a basic model for larger cities, medium-size cities, smaller rural cities of at least some basic frameworks of what has been done—what is available, how they can utilize it, and then providing a mechanism for those that are being innovative and creating new things to be able to piece that

in, so that we can save time and money of what the other folks are doing?

Mr. GRIFFIN. To answer that question maybe better than I started to. We are working with—we do work with FEMA on those very processes. We also spend a lot of time developing toolboxes, which will allow local jurisdictions to take the knowledge that we have gained and adapt it for their personal uses, tailored to their organizations just for those reasons.

The other part of one of the drives that I have had is also to better define where we are putting our money, so that people understand what projects we are working on, so they can begin to think about how it could be adapted for their use. We do take best practices and we do push them out to the first responders so they can see what other first responders do. Because what we find is that first responders who talk to first responders are learning an awful lot.

So it gets back to the conversation that we had a little bit before. But building toolboxes and basically, excuse the analogy, but teaching first responders how to fish, rather than giving them the fish is part of our responsibilities and it is something that we do do.

Ms. RICHARDSON. Okay. Mr. Chairman, could I ask one last question?

Mr. BILIRAKIS. Yes, but one more question.

Ms. RICHARDSON. Okay. Thank you, sir.

Dr. Griffin, do you feel it is appropriate that if an agency is using Federal dollars to create a system, is it appropriate for them to be charging other jurisdictions to utilize that same system if it was Federal dollars that was spent? If you don't think it is appropriate, do you have any rules or process in place to prohibit that from occurring?

Mr. GRIFFIN. Ma'am, I am not sure about any rules. I will gladly, for the record, return a more cogent answer to you.

I can tell you from my own first experience in the first responder community is that anything that we developed, particularly money that was—well, it was anything that we developed in either Loudoun County or as Chief or in Arlington County, we gladly gave for free to other communities. So there is an awful lot of sharing that does go on from community to community. I will find a more cogent answer to your initial questions about policies on charging.

Ms. RICHARDSON. Okay. It is not just restricting to Arlington, but it is other agencies that may be seeking to charge Arlington and/or other jurisdictions. Thank you. Thank you, Mr. Chairman.

Mr. BILIRAKIS. Thank you. Thank you. Ms. Clarke, you are recognized for 5 minutes.

Ms. CLARKE of New York. Thank you very much, Mr. Chairman.

Dr. Griffin, many of us believe that S&T should have a formal strategy, clear guidelines, and requirements for first responders funded research. In your testimony, you talked about the first responder Integrated Product Team, IPT. You mentioned the solution development process as part of the IPT, but it appears to be an informal mechanism to hand out millions of dollars in research.

What specific steps are you taking to make the Integrated Product Team more analytically rigorous? Please give us more detail

about the solution development process. Who serves on it? Who does it answer to? What role does it play in your overall strategy?

Mr. GRIFFIN. Thank you for the question, ma'am. It is a very complex question. Again, I will be glad to submit, for the record, a more formal answer. If I could just real quickly try to hit on it. The process that I laid out in my written testimony is actually a very formal process that I have instituted within our group. So as we have defined the strategic programmatic areas that we are working on, what we do is that we use the IPT process and outreach to first responders is to begin to gather requirements that we build projects off of. Those projects then are worked through the formal process within Science and Technology that Under Secretary O'Toole briefed you on.

So what I have done is that I have integrated our IPT process with what is happening in S&T. So we work through the same portfolio review process. In fact, each month I take a quarter of our portfolio and work a smaller portfolio review process to make sure that we are meeting the goals and metrics that we have defined for those projects. So it is very formal as far as working into the new systems that have been incorporated into Science and Technology.

In addition, what we have done is that we have tried to define areas—those programmatic areas that we are going to fund, recognizing that there are lots of capability gaps that were identified in Project Responder. There were 40. We are putting money towards five. Of those five, we are hitting only partial, you know, partial solutions to those questions.

But what I can show you, though, is a much more programmatic structured approach to how we are spending our money and how we are leveraging a lot of other folks' money. So it is a much more structured process than it was. It is a much more strategic process with the idea of both identifying where short money can go, but also areas that we just are not able to hit because of budgetary constraints.

Ms. CLARKE of New York. Well, thank you. Clearly, that is a real challenge when you are really—you are dealing with such a fluid dynamic in the varying jurisdictions around the Nation and terrain. You know, we talked about the forest fire incidents and the types of new technologies that would be applicable there may not necessarily be applicable in a municipality or a city.

Mr. GRIFFIN. Yes, ma'am. If I could just hit that point 1 second. If you look at the gear on the table, what for a long time we were doing is we were putting our wildland fire fighters instructional gear—like you see my old jacket there—what we have done is working with the Department of Defense and Agriculture and U.S. Fire Service and Kell Fire, is that we have developed a new set of gear based on requirements gathered from the wildland fire fighters, just because it represents such a change in the need of gear. Okay. That is just a prime example of how we are trying to provide goods to the first responder community.

Ms. CLARKE of New York. There is much more of a rigorous application than I guess we read into in terms of the testimony. I look forward to you just forwarding to us something more, I guess, more substantive that pulls it all together for us.

Then my final question is to you, Chief. I want to thank you, once again, for taking the time away from what I know are massive duties back in the city.

In your testimony, you talked about your tiered response system. Is that different from the Incident Command System?

Chief KILDUFF. Well, Incident Command System would provide oversight to—and structure to an incident. Our tiered response is taking certain equipment and certain training abilities, putting them in different units, and then having a layer of these different units respond to an incident.

So we would have our hazmat unit. If we had a hazardous materials incident, we would have our hazmat unit respond with over 600 hours of training and we would couple them with more local units that would have a reduced number of training but still capabilities to complement the hazmat unit. Then we would train them down. We would have other units respond that might be entry units. Below that, we would have units come that might be decontamination units, and units that would then decon any victims or any patients of some sort, hand them off to an advanced layer of EMS personnel that have special training.

So what we have done is we have layered the capabilities of our units. These units respond every day as fire fighting and emergency response units. Same thing with EMS, though we have given them additional capabilities so we can layer whatever response is necessary for a particular incident.

Ms. CLARKE of New York. Mr. Chairman, I know that I have gone over time. I just have one more question.

Mr. BILIRAKIS. We are going to have a second round, but you can have another question.

Ms. CLARKE of New York. Okay. Thank you. Thank you, sir.

I just wanted to find out whether, Chief, you had any ideas that are coming from the men and women from a ground-up perspective. How do you take these new ideas and evaluate them to see if they in fact are valuable? Then second, does the department have any formal way or protocol for you to send ideas that you have vetted by the department to be evaluated by your policymakers, laboratories, and advisory panels?

Chief KILDUFF. If we receive something from the field units that is of particular interest to us, we generally will direct it to your research and development folks who have the ability to reach out to many different testing and validation throughout the country. We do rely heavily on the National Fire Protection Association and the standards that they have set for a lot of our equipment. That equipment has also been tested by other folks to validate the usefulness of the equipment.

So there are actually quite a few layers that we can go through. You know, S&T is one group that represents a National level, so to speak, but there are other private interest groups, private testing companies that we will all channel through our research and development folks. We are fortunate that we do have a robust research and development. That is really why we are here is because not everybody has that capability, but that is how we would work that.

Mr. BILIRAKIS. Thank you very much. I will recognize myself for this second round for 5 minutes.

First question is for Ms. Saunders. I was pleased to read in your testimony your reference to the NIST, National Telecommunications and Information Administration laboratory at the Department of Commerce in Boulder, Colorado at the campus. My staff has visited this site and was very impressed with both the work being carried out and the expertise and dedication of the staff working there.

With regards to the 700 MHz Public Safety Broadband Network that is being constructed in the coming years, in your opinion, are NIST and NTIA being given all the resources that they need in order to develop the necessary standards and to plug the gaps, as you call them, so that the network will be a success?

Ms. SAUNDERS. Thank you, Mr. Chairman. I mentioned the recent passage of the Middle Class Tax Relief and Job Creation Act of 2012, Public Law 112–96, and its allocation of $7 billion in funding and new broadband spectrum. So our colleagues in the National Telecommunications and Information Administration are actively pursuing essentially a loan or an advance on that funding, so that in partnership with NIST, we can go ahead and take the next steps in terms of both the test bed and the standards participation.

We are in the process of developing a memorandum of understanding between NTIA and NIST, laying out respective roles and responsibilities very clearly in this particular space. I will say that our technical staff at NIST have gone ahead and aggressively identified the relevant centers' organizations and a major center's organization is at the international level. So these are international standards and have already established NIST institutional membership in those organizations and we are gearing up to—we have already begun participating. So we are well on our way to taking the next step with the test bed.

Mr. BILIRAKIS. Very good. Thank you very much.

Our next question is for Mr. Griffin. The Emergency Preparedness Subcommittee has been closely following the development of the Commercial Mobile Alert System, CMAS. In your testimony, you noted that S&T is working on a number of activities to improve the system capabilities. Would you please elaborate on this and how are you working with, of course, FEMA, the FCC, wireless carriers, and alert originators to get these enhanced capabilities into the field?

Mr. GRIFFIN. Certainly, sir. The Science and Technology and the First Responder Group is actually responsible for the RDT&E, the Research, Development, Test, and Evaluation for Commercial Mobile Alert Services, CMAS, and the Integrated Public Alert Warning System, IPAWS. We work in close partnership with both the FCC and FEMA and the private industry, because the carriers are incredibly important in the whole alerting and warning systems.

I would highlight the work we did in December 2011 in New York City. We are working with the Department of Emergency Management in New York, FEMA, and their Central Aggregation Systems, and the commercial carriers. We were able to send the first end-to-end text message for alerts and warnings. We are tak-

ing the information that we learned from that test and we are developing both lessons learned and identifying additional work that needs to go on within the sphere of CMAS and IPAWS.

What is coming next for us is that we are looking at funding. We are currently funding research on public response. We are looking at targeting of alerts to specific geographical areas. We are planning four regional tests and a National test on public alerts and systems. We are developing best practices, lessons learned, and case studies for alert originators that will help both local emergency managers as well as industry leaders work together as far as developing a National alert system.

Mr. BILIRAKIS. Thank you very much. Chief, you want to comment on the testing that took place in New York with regard to CMAS?

Chief KILDUFF. Actually, that was actually run through OEM, but I am not personally that familiar with it. I know that we participated. We have some very talented people that have been working on it, but I personally am not that familiar with it.

Mr. BILIRAKIS. All right. No problem. Well, thank you very much. Appreciate it. Now I yield 5 minutes to the Ranking Member, Ms. Richardson.

Ms. RICHARDSON. Thank you, Mr. Chairman.

Dr. Griffin, coming back to follow up on some earlier questions. You mentioned that S&T works with FEMA to provide information to first responders. Other than your firstresponders.gov and so on, what other mechanisms are you doing to coordinate with FEMA to ensure that first responders know what equipment is available, what they might possibly need, and how they might go about interacting?

Mr. GRIFFIN. Sure. We work closely with FEMA in a number of different ways. So FEMA has responsibility for coordination of operations and does a lot of outreach with local first responders, State and local first responders, and is responsible for grant funding. We are responsible for the research, development, test, and evaluation developments and standards and requirements-gathering process. We do these in conjunction with our FEMA partners.

So when we set out initially to begin to figure a way to create a formalized process for gathering requirements through Project Responder, we did that in conjunction and in partnership with FEMA. We also work with FEMA in areas like the alerts and warnings standards I just spoke to, as well as other standards, communications interoperability standards—the 2P25 standards—which we develop in conjunction with people like NIST and others. Then we work with the FEMA grants folks to make sure that interoperability language is worked into the grant process.

As we look at areas like data sharing and how we can move data from like New York City to the State of New York to the Federal agencies and then back down again. So I think it is critical that we figure out ways to move data from both the Federal agencies back down to local governments. We work closely with FEMA to make sure that we are integrating all of our systems with the systems that they use. So we work closely with them in most aspects of everything that we do.

Ms. RICHARDSON. Okay. Ms. Saunders, the budget for S&T was significantly reduced from 2011 to 2012. As a result, the funding to NIST dropped from $18.6 million to $17.6 million. Were there projects that were discontinued or delayed due to the result?

Ms. SAUNDERS. Yes, ma'am. There were. There are various projects impacting first responders at the Federal, State, and local levels have either been scaled back or are no longer funded due to the changes in the funding that you mentioned.

I will give you two examples. One is our projects associated with personal protective equipment, specifically for the Fire Service. Many of these efforts prior to this year focused on standards development through the National Fire Protection Association and successful development with respect to thermal exposure measurements for first responders in the areas of PASS devices, radios, and self-contained breathing apparatus.

The standards for respirator masks—we have not yet been able to get to the thermal metrics to those and currently there are no high-temperature performance metrics that exist to test respirator masks under high heat conditions. Those efforts were not funded this year. S&T's First Responder Group and Human Factor's Division was unable to fund the last phase of an effort to develop a standard design guidance for the patient compartment for an ambulance that takes human factors and safety into consideration. The EMS community had identified this as a No. 1 requirement.

We were able to stretch fiscal year 2011 funding to ensure that we will be able to provide design guidance to NFPA next spring to incorporate into the standard. It won't be quite as comprehensive as originally planned, but we are able to continue that. I would be happy to provide and follow up with a specific list of the projects that were either terminated or reduced in funding.

Ms. RICHARDSON. Could you provide that to the committee, please, as soon as possible? Thank you.

Last two questions. Chief Coons, with respect to R&D, do you think that the Department adequately responds to the needs of first responders?

Ms. COON. Did you mean Chief Kilduff?

Ms. RICHARDSON. Yes. I am sorry.

Chief KILDUFF. Well, we are talking about the FDNY R&D?

Ms. RICHARDSON. Yes.

Chief KILDUFF. Yes. From our point of view, we think that we cycle new equipment—a lot of PP through there. Everything that we—a lot of communications equipment we cycle through R&D. We pilot everything that we do. We don't just randomly throw it out because somebody put a stamp of certification on it or some agency or some bureau or whatever says this is the hottest, newest, best product there is.

Everything we do, we test it thoroughly. Then we select companies and we pilot the equipment for an extensive period of time. We also collect an extensive amount of data and evaluations on that equipment. So we find, from within, out R&D is a very effective unit.

Ms. RICHARDSON. But do you feel that the Department's R&D is appropriately supportive?

Chief KILDUFF. Yes. Yes.

Ms. RICHARDSON. Yes. Okay. If I might, and I am sorry, Mr. Chairman, for asking this twice. But I have noticed Ms. Doying has not had an opportunity to comment as much. I just think it is appropriate if we could give her an opportunity if there is anything else. I didn't have a specific question, but if there was something else you wanted to——

Mr. BILIRAKIS. Yes, I was going to ask them all, in truth. Yes. Absolutely.

Ms. RICHARDSON. Okay.

Mr. BILIRAKIS. But she can take the opportunity now if she wishes.

Ms. RICHARDSON. Sure. Ms. Doying, was there anything else that you wanted to convey based upon all of the other testimony that is going on that maybe we haven't asked you that you feel would be appropriate to share?

Ms. DOYING. Well, I find it interesting that there is what, to my perception, is a common thread. This is that there is a lot of good work being done and it may just be a matter of smaller communities, which I represent, not having strong visibility of what is out there and available to them. It may sound a bit strange for me to say, but it is almost as though a strong public relations campaign about the good stuff that is out there is needed. I know that this is true for, for example, the IPAWS and the CMAS projects.

You know, if the public doesn't know the good work that is being done by local, State, regional, and Federal authorities, well then certainly the guys that are really busy trying to do their job—local government's been under a huge constraint financially, so we have scaled back and scaled back. So for local leadership to have the energy to study the big things that are going on around them and grab hold of those big things and make use of them locally, it is difficult. It is a huge challenge.

So it may sound a bit funny to say—you know, we go home and we watch TV in the recliner and we are told a lot of stuff and we missed the most important stuff while we were at work, because for some reason, it just wasn't shared cross-jurisdictionally.

Mr. BILIRAKIS. Thank you very much. Yes. Again, anyone else want to add something with regard—any concerns that you might have, any suggestions that you have?

Of course, Dr. Griffin, if you want to elaborate further on the equipment here. Is this equipment ready for prime time? Is it in development? Anyone else want to add whether this particular equipment here in front of us will be helpful, affordable, what have you, accessible? But, Dr. Griffin, do you want to elaborate further, first? Then I want to give everyone an opportunity to speak, because we do have some time.

Mr. GRIFFIN. Thank you, Mr. Chairman. If I could, please. Part of the paradox of our world is that if we do our job well, and this is particularly for Science and Technology and NIST and the first responder community, is that people don't know. So when they pick up or purchase a radio from Motorola or Talis or Harris that provides an increased level of interoperability, what gets lost is the amount of work that goes into the standards and the development of that technology.

So part of it is marketing. Part of it is realizing that one of metrics of success is knowing that our standards are making a difference in the field. We try to listen to the first responders' needs and transition equipment quickly.

I am going to highlight really quickly the story of the backboard cover in front of you, sir. We received an inquiry through firstresponder.gov from some EMS providers in Florida, who were concerned about the cleanliness of backboards. They said are there ways that we could do something about that? What we are able to do is, was work with a small business and first responders developed requirements and within 9 months had a concept to commercially available backboard cover that slips right over the board and provides protection for not only the patients, but also our first responders.

That is really how we are trying to think about the quick transition of equipment to the first responder community. That is disposable. It sells for $15. So it is affordable.

Some of our other technologies—the fire fighter gear is in pilot. We are looking at different fibers. We are looking at different weaves. We are looking to try to hit a different set of requirements for the wildfire gear. That is why we have a thousand sets of gear that we are going to be looking at this summer to see which is the best fit for our wildland fire fighters.

Then if you start to look at the self-contained breathing apparatus here, you can see that the older sort of steel cylinder and what we have done with a Kevlar wrap. That is work that we are still working with the commercial sector, with the idea that frankly we don't purchase equipment for the first responders. We develop technology and then we have to make sure we have a strong working relationship with the commercial sector in order for them to have a place to buy it.

So these are all examples about how we are trying to bring both process and good to the first responder community.

Mr. BILIRAKIS. Ms. Saunders, would you like to add something?

Ms. SAUNDERS. Just briefly, to build on what both Chief Kilduff and Dr. Griffin mentioned. I agree strongly, if NIST is successful at what we do in terms of our measurement science contributions, that role will not be visible, but what you will see, or what the first responders will see, are standards for apparatus and equipment and systems that have a strong technical underpinning and can be tested with respect to how they perform. That is an important point that Chief Kilduff made.

A standard is only useful if it is implemented. For, in this space in particular, that necessitates testing or, in some cases, certification of the equipment. That testing needs to be done by competent authorities, competent independent test labs or certification authorities. Then that information needs to be made available and characterized in practical terms so that first responders can actually make informed decisions about the types of equipment or the quality of equipment that they purchase.

Mr. BILIRAKIS. Chief, would you like to add anything?

Chief KILDUFF. Yes, sir. Thank you. Just as a point of information, we are developing a program right now that we will be working with NIST this summer out in Governor's Island in the harbor

of New York. We are going to burn up a few buildings up there. Together with NIST testing ability, we are going to test fire dynamics. We are going to test ventilation principle, et cetera.

So there is collaboration that goes on to set standards that will be presented to a National audience. It takes a little time, but it will be presented to a National audience. It is good work that goes on.

I think what you have heard also today is important for the committee to take into consideration—that first responders, particularly the fire fighting and EMS communities are the folks that put their hands on the people when something happens. We are the ones that go to get the people when they are in danger or when they have been affected by an incident or an event or whatever it is—whether it is Joplin, or whether it is a hurricane, whatever the situation is, or that biochem release. This equipment here is going to enable us to go into that environment and get people out of the environment.

We have spent an awful lot of time over the years, particularly since September 11, trying to secure the country, all for good reasons and extremely important. But now I think the first responder community I think is demonstrating every year, as we move away from September 11, away from that security mindset to some degree, that it is important to fund the folks that are helping people day-in day-out in those all-hazards event and everything else, not just terrorist-type of events.

So that is where I would like to leave the focus of this. That is where our focus is. We want to collaborate with everybody here. We also sent dispatchers down to Arlington about a month ago to look at their OEM center there because we are investing hundreds of millions of dollars in a call center up in New York. We wanted to go down, because we knew they had some best practices down there. It is all collaboration, but it is all to create a network of information and intelligence, when necessary, to make people safer when they do enter those environments to, again, get the people out or assist the people, whatever needs to be done.

So I just wanted to leave with that point of view. We are willing to collaborate with anybody and we fully expect that this is now going to shift to a regional, if not a National, perspective when it comes to this first responder capabilities.

Mr. BILIRAKIS. Thank you. Ms. Doying, the RNC, of course, the convention will be held in Tampa in August. Has the local Tampa Police Department reached out to Pasco County, the neighboring county north of Hillsboro County with regard to—if you would like to speak. Has there been cooperation, because obviously they are in need of your services? If you want to speak to that or anything else, you are welcome to.

Ms. DOYING. Sure. Yes, the approach from the first response community towards the incoming folk for the Republican National Convention has been a collaborative region-wide approach. Actually, our State-wide partners are assisting with that. It is very, very collaborative. A lot of good equipment going on the street, people being outfitted and trained in the use of the best technology that will ensure protection of people that are arriving in the greater Tampa Bay area.

You know, I found that as the Chief talked, it really resonated with me that we are in a better place in the year of 2012. I have served for 20 years in emergency management in the State of Florida. What I have observed just in the last decade is a really strong movement towards standardized approaches to managing incidents.

I have seen a very strong effort coming out of the Department of Homeland Security to ensure that the first response community is well supported and it is recognized that it is the first response community that serve the local citizen that is in danger and in need. I applaud and appreciate the efforts of the Department of Homeland Security. Coming from a small local community, we feel the effects. We definitely feel the effects of Science and Technology and of NIST.

Mr. BILIRAKIS. Thank you very much. Ms. Coon, would you like to add anything?

Ms. COON. Just one point to support what Ms. Doying said, actually earlier. When we look at crisis management, just as we don't expect people to act in a crisis beyond the aptitudes that they are already performing well, in day-to-day, we don't—we shouldn't expect that. We just want to be able to support people to do what they do well.

I think, in this case, S&T does well with what they are doing in technologies. The key here is that I believe, to Ms. Doying's point about the PR campaign, FEMA plays a critical role in this—that FEMA can be that facilitator among circulating technologies—what is working—what is not working. They have field and regional offices that are working on these issues all the time.

That to me might be a—if we look at what can be done more effectively or more efficiently, it is creating that role. Whether it is the PR campaign, which I think is a great way to categorize it, or something to be able to communicate and create that liaison role between what is happening in Science and Technology, the first responders. FEMA really is a very strong element and that infrastructure is already in place and we need to utilize that more effectively.

Mr. BILIRAKIS. Very good. Well, thank you very much. I appreciate it. It was a great testimony—very informative—very valuable. I think it has been a very productive hearing.

I also want to note that Chairman Lungren has been detained in the Judiciary Committee. I know he shares our interest in this topic. His questions will be entered in the record, so if you could respond to those questions.

I thank all the witnesses, of course, for their valuable testimony, and the Members for their questions. The Members of the subcommittees should be reminded that additional questions—they probably will ask you additional questions in writing and we ask that you respond in writing. The hearing record will be open for 10 days.

Without objection, the subcommittees stand adjourned. Thank you very much, again.

[Whereupon, at 12:34 p.m., the subcommittees were adjourned.]

APPENDIX

QUESTIONS FROM CHAIRMAN GUS BILIRAKIS FOR ROBERT GRIFFIN

Question 1. For some time, the DHS Science and Technology Directorate had grappled with how to best interact with the Nation's many and diverse State and local first responders to ensure that their technology needs were being met. S&T has clearly amended its process in the past few years in a way that seems to have alleviated some of those partnership issues and fostered much more inclusiveness.

Do you believe that S&T is in the most optimal place now when it comes to engaging first responders and ensuring that their requirements are heard? Or is there any room for improvement?

Answer. Response was not received at the time of publication.

Question 2a. Please provide additional information about the process the Science and Technology Directorate uses to identify capability requirements from the first responder community and prioritize those requirements into research projects.

Specifically, how are requirements validated and prioritized for funding by the Directorate? What specific criteria are used? Do projects or solutions that have broad applicability to different types of First Responder communities have a higher priority?

Answer. Response was not received at the time of publication.

Question 2b. How is the First Responder Integrated Product Team (IPT) integrated into the overall IPT process for the remaining divisions within S&T? Are requirements that are identified within the First Responder IPT cross-walked against requirements that may be developed in other IPTs to identify duplications or overlaps that may present opportunities for efficiencies or synergies?

Answer. Response was not received at the time of publication.

Question 3. The Interagency Board (IAB), with whom you partner, develops a list every year of research and development (R&D) priorities for first responder equipment. The list is based on a survey of first responders in categories such as urgent need, mission performance, and life safety.

How do S&T's R&D priorities and investments reflect this annual list produced by the IAB?

Answer. Response was not received at the time of publication.

Question 4. You have indicated that you work closely with the National Institute of Standards and Technology (NIST) on standards development for the technologies in your portfolio.

How many of your projects are coordinated with NIST and with standards-developing bodies? All of them? I am wondering whether any Federally-funded technology does or should have standards developed concurrently with the technology itself.

Answer. Response was not received at the time of publication.

Question 5. What are the options for first responders when it comes to assessing whether a piece of equipment is a good purchase? I know S&T has the SAVER program, and FEMA has the Authorized Equipment List. Can you please provide the committee with a list of all of the different programs like this that are available to evaluate first responder technologies, describe how they are different, and tell us where the gaps still are?

Answer. Response was not received at the time of publication.

QUESTIONS FROM CHAIRMAN DANIEL LUNGREN FOR ROBERT GRIFFIN

Question 1. I was interested to hear you mention in your testimony that at least one of the projects you have worked on is covered by the SAFETY Act. As you know, I am a big believer in the value that the SAFETY Act law has brought to homeland security through liability limitations.

Can you please describe how much and in what ways you coordinate with the SAFETY Act Office at S&T to try to push more first responder technologies through

their process toward designation or certification, which could increase their usage in the field?

Answer. Response was not received at the time of publication.

Question 2. While DHS makes significant acquisitions of technology for its components, little guidance is provided in the annual budget forecast about capabilities that merit development funding, and what future funds might be devoted to commercializing such capabilities. This makes it challenging for policymakers, State and local governments, the private sector, and research and development organizations to prepare for future needs and impacts of DHS investment decisions. Congress has asked DHS to develop a multi-year budget forecasting process similar to the 5-year process undertaken by the Department of Defense.

Can you tell us how S&T is contributing to multi-year planning efforts, and explain how multi-year planning can help you be a better steward of taxpayer dollars?

Answer. Response was not received at the time of publication.