Statement of K. David Nokes
Sandia National Laboratories

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Committee on Energy and Commerce
Subcommittee on Oversight and Investigations
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INTRODUCTION

Mr. Chairman and distinguished members of the committee, thank you for the opportunity to testify on the Administration's proposal to create a Department of Homeland Security, and specifically, the radiological, chemical, and biological response activities that may be of value to the new department. I am David Nokes, Director of Sandia National Laboratories' Systems Assessment and Research Center. I have more than forty years experience in the nuclear weapons program, and currently head Sandia's activities that support our nation's intelligence community as well as the laboratory's activities in homeland security and the war against terrorism. I will shortly assume responsibility for all of Sandia's arms control, threat assessment, security technology, nonproliferation, and international cooperative programs as Vice President of Sandia's National Security and Arms Control Division.

Sandia National Laboratories is managed and operated for the National Nuclear Security Administration (NNSA) of the U.S. Department of Energy (DOE) by Sandia Corporation, a subsidiary of the Lockheed Martin Corporation. Sandia's unique role in the nation's nuclear weapons program is the design, development, qualification, and certification of nearly all of the nonnuclear subsystems of nuclear warheads. We perform substantial work in programs closely related to nuclear weapons, including intelligence, nonproliferation, and treaty verification technologies. As a multiprogram national laboratory, Sandia also conducts research and development for other national security agencies when our special capabilities can make significant contributions.

At Sandia National Laboratories, we perform scientific and engineering work with a mission in mind—never solely for its own sake. Even the fundamental scientific work that we do (and we do a great deal of it) is strategic for the mission needs of our sponsors.

Sandia's management philosophy has always stressed the ultimate linkage of research to application. When someone refers to Sandia as "the nation's premier engineering laboratory," that statement does not tell the whole story: We are a science and engineering laboratory with a focus on developing technical solutions to the most challenging problems that threaten peace and freedom.

My statement will describe Sandia National Laboratories' contributions and capabilities in homeland security and discuss our technologies for radiological, chemical, and biological sensing. I will also describe our role in nuclear incident response and comment on the proposed relationship of that function to the Department of Homeland Security. Finally, I will offer suggestions for how the new department can efficiently access and manage the scientific and technology development resources it will require to support its mission.

SANDIA'S CONTRIBUTIONS TO HOMELAND SECURITY AND THE WAR AGAINST TERRORISM

Like most Americans, the people of Sandia National Laboratories responded to the atrocities of September 11, 2001, with newfound resolve on both a personal and professional level. As a result of our own strategic planning and the foresight of sponsors to invest resources toward emerging threats, Sandia was in a position to immediately address some urgent needs.

For example, by September 15, a small Sandia team had instrumented the K-9 rescue units at the World Trade Center site to allow the dogs to enter spaces inaccessible to humans while transmitting live video and audio to their handlers. This relatively low-tech but timely adaptation was possible because of previous work we had done for the National Institute of Justice on instrumenting K-9 units for SWAT situations.

You may perhaps be aware that a formulation developed by Sandia chemists was one of the processes used to help eliminate anthrax in the Hart, Dirksen, and Ford buildings on Capitol Hill and at contaminated sites in New York and in the Postal Service. Sandia had developed the non-toxic formulation as a foam several years ago and licensed it to two firms for industrial production in 2000. The formulation neutralizes both chemical and biological agents in minutes.

An array of devices invented by explosives experts at Sandia have proved to be effective for safely disarming several types of terrorist bombs. For the past several years, our

experts have conducted training for police bomb squads around the country in the techniques for using these devices for safe bomb disablement. The shoe bombs that Richard Reid allegedly tried to detonate onboard a trans-Atlantic flight from Paris to Miami were surgically disabled with an advanced bomb-squad tool originally developed at Sandia. That device, which we licensed to industry, has become the primary tool used by bomb squads nationwide to remotely disable handmade terrorist bombs while preserving them for forensic analysis.

Sandia is a partner with Argonne National Laboratory in the PROTECT program (Program for Response Options and Technology Enhancements for Chemical/Biological Terrorism), jointly funded by DOE and the Department of Justice. PROTECT's goal is to demonstrate systems to protect against chemical attacks in public facilities, such as subways and airports. For more than a year, a Sandia-designed chemical detector test bed has been operating in the Washington D.C. Metro. The system can rapidly detect the presence of a chemical agent and transmit readings to an emergency management information system. We successfully completed a demonstration of the PROTECT system at a single station on the Washington Metro. The program has since been funded to accelerate deployment in multiple Metro stations. DOE has also been requested to implement a PROTECT system for the Metropolitan Boston Transit Authority.

Another major worry for homeland security is the potential for acts of sabotage against municipal water supplies. In cooperation with the American Water Works Association Research Foundation and the Environmental Protection Agency, Sandia developed a security risk assessment methodology for city water utilities. This tool has been employed to evaluate security and mitigate risks at several large water utilities. We have used similar methodologies to evaluate risks for other critical infrastructures such as nuclear power-generation plants, chemical storage sites, and dams.

These and other contributions to homeland security and the war against terror are possible because of strategic planning we had conducted years ago and early investment in the capabilities that were needed to respond to emerging threats. The outstanding technology base supported by NNSA for its core missions is the primary source of this capability. We also made strategic decisions to invest laboratory-directed research and development funds (LDRD) in the very things that we knew were urgent needs: items to the Afghanistan

theater, the decontamination foam, the sensors we have deployed, and special-purpose robotics that we have developed. In recent months, requests for Sandia's services from federal agencies other than DOE for work in emerging areas of need have increased. Approximately twenty-eight percent of our total laboratory operating budget is now provided by federal agencies other than DOE.

SANDIA CAPABILITIES FOR HOMELAND SECURITY

Sandia National Laboratories and the other nuclear weapon laboratories constitute a broad, multidisciplinary technology base in nearly all the physical sciences and engineering disciplines. We seek to leverage those capabilities to support other national security needs germane to our missions, including homeland security, when our capabilities can make significant contributions.

Nuclear Sensing

A terrorist with a nuclear weapon and the knowledge and skill to use it, *will use it* if he is not stopped. The Department of Homeland Security will be responsible for preventing an attack on the United States by a terrorist with a nuclear weapon of mass destruction (WMD). The Department must prepare for this type of attack by reducing the vulnerability of the United States to nuclear terrorism through detection, identification, and interdiction of the nuclear materials that could be used in such an attack.

Nuclear weapons that could be used by a terrorist organization can be divided into three categories:

- A stolen or purchased *functional* nuclear warhead. Such a device has a high level of sophistication and the probability that it would detonate is high. The damage it would cause would be great, with large-scale loss of life, environmental devastation, and economic ruin.
- A weapon indigenously crafted, by a terrorist organization, from *stolen or purchased* plutonium or uranium. This device would have a moderate level of sophistication and a lower probability that it would detonate. However, if it did detonate, the damage could be great, perhaps similar to that caused by a stolen or purchased weapon.
- A radiation dispersal device (RDD) often referred to as a "dirty bomb." This is not a nuclear weapon, but consists of radioactive material (of any type) packaged with

conventional explosives. It is designed simply to disperse radioactive material over a target area. The level of sophistication may be very low, but the probability that it would work is high, although the results desired by the perpetrator may be difficult to achieve. The actual damage a weapon of this type would cause is relatively small, compared to a nuclear detonation; however, it would result in radioactive contamination and could cause public panic and fear.

A nuclear bomb is a product of science and technology, and it is this same technology that must be used to protect against its use by terrorists. Scientists and engineers at the nation's nuclear weapon laboratories understand nuclear weapons—how they work, how to build them, what they can do. More importantly for homeland security, they know how to detect them, what characteristics to look for, how to sense their emissions, how to interpret what the sensors detect, and how to disable them.

Sandia National Laboratories has more than fifty years of experience in the nuclear weapons arena and an extensive knowledge of nuclear weapon science and technology. In addition to our mission of nuclear weapons stewardship, we have long been committed to safeguarding the nuclear weapons stockpile and actively supporting nonproliferation. The terrorist attack at the 1972 Munich Olympics focused our awareness on our nation's vulnerability to terrorist attacks abroad and, in particular, on the need to protect our stored nuclear weapons. This led to our work in access delay and denial at weapons storage sites and improving the security of weapon storage vaults. More recently, we have turned our physical protection expertise to protection and control of nuclear materials in Russia and the former Soviet Union.

If a terrorist intends to detonate a nuclear or radiological device in the United States, then he must deliver that device to his target. The device will emit radiation that can be detected with a radiation sensor. If his nuclear device was acquired or built outside the United States and smuggled into the country, we must find it before it enters or as it crosses into the country. If it originates in the United States, then we must detect it when it is being transported to the target site.

There are many different types of radiation detectors. The one that usually comes to mind is the Geiger counter, a simple device that can detect the presence or absence of some types of radiation. But it can't tell you very much about what type of material is

emitting the radiation. Because there are many naturally occurring, medical, and industrial radioactive materials, knowing what type of material is emitting the radiation is crucial in order to avoid false and nuisance alarms and to zero-in on only those objects that pose a threat. For this purpose you need a spectral sensor.

Sandia National Laboratories produces radiation sensors for a variety of government customers. One of our specialties is spectral sensor systems that provide automatic radioactive material identification using special algorithms developed by Sandia. These systems detect and analyze nuclear materials quickly, in real time, in indoor or outdoor environments, and with a high degree of precision that provides a high level of confidence. We have produced a wide variety of sensor systems, from very large, fixed installations to small, rugged, portable battery-powered units.

Sandia's Radiation Assessment Identification and Detection (RAID) System was originally conceived, built, and tested before the tragic events of September 11, 2001. However, it meets the post–9/11 need to help safeguard our nation from nuclear terrorism. This system is designed to detect and identify radioactive materials transported through portals at passenger and package terminals at international ports of entry. RAID uses a commercial sodium iodide scintillation spectrometer and associated electronics, along with Sandia-developed analysis algorithms, to detect and identify radioactive materials passing within several meters of the sensor. A video image of the detection event scene is displayed on a base-station computer. The system automatically and continuously updates and recalibrates for background phenomena and can identify a radioactive source even if the source is shielded.

Based on our experience with RAID and other more advanced nuclear sensing systems, we believe the state of development of our nuclear sensors is such that the technology could be quickly transferred to commercial producers and widely and rapidly deployed at a cost of less than $50,000 per unit. These deployed systems would have a very high probability of detecting a smuggled nuclear weapon or an RDD if properly deployed. Nuclear sensing systems could be placed at ports of entry, around likely targets, or even scattered throughout a city to scan people, packages, and vehicles. Since these sensors are passive devices, they don't emit a signal and, consequently, are very difficult to detect. In other words, a terrorist can't use a radar detector to determine if one of these sensors is present.

Unbeknownst to a terrorist, an alarm from one of these sensors could alert law enforcement personnel to the presence or movement of a weapon that employs radioactive material.

Of course, challenges exist in transitioning any technology from the laboratory to mass-produced industrial products. However, as we have demonstrated many times with technologies that we have transferred to industry in the past, Sandia works closely with industrial partners to work through the design challenges associated with manufacturing engineering and commercialization.

Another important tool in the war against nuclear terrorism is the Department of Energy's Second Line of Defense (SLD) program. Its purpose is to minimize the risk of nuclear proliferation and terrorism through cooperative efforts with foreign governments to strengthen their overall capability to detect and deter illicit trafficking of nuclear material across their borders. Here too, the nation's nuclear weapons laboratories have brought to bear their technical expertise in nuclear physics and engineering. Short-term, the Second Line of Defense program has adapted commercially available radiation detection equipment, security systems, and communications equipment to work comprehensively with Russian Customs and other foreign agencies to stop nuclear smuggling now. It is effective in detecting both weapons material and radiological dispersal devices.

Long-term, the Second Line of Defense program will deploy radiation detection equipment optimized for border use, integrate it with local, regional, and national-level communication systems geared for quick response, and cooperatively train foreign officials in use of the systems. Long-term sustainability is planned into every level of the program to ensure continued training and equipment maintenance.

Chemical and Biological Agent Sensing

Sandia is developing a variety of technical solutions to counter the threat posed by chemical and biological agents. This activity is supported by the DOE Chemical/Biological Nonproliferation Program (CBNP) and includes threat and response analysis, environmental sensing and monitoring, facility protection and biosecurity, advance chem/bio-terror warning systems, reagent design, and decontamination technology.

Sandia has developed a portable bio-sensor to put into the hands of first responders. Configured to detect toxins such as ricin and botulinum, the device uses micro-fabricated

"chips" as a miniature chemical analysis lab to isolate and identify biological agents. This system has been demonstrated to also reliably and rapidly detect a variety of chemical weapon agents in realistic situations where obscurants to mask the signature are present. The system is being modified to analyze viruses and bacteria. We have identified commercial partners to produce and market the unit.

A prototype handheld detector under development at Sandia can identify anthrax in less than five minutes. The instrument analyzes fatty acid esters vaporized from the cell walls of bacteria and compares them with cataloged signatures indicative of anthrax or other pathogens. This technique has been used to identify pathogens at the genus level and often at the species level. Identifying the bacillus in minutes, rather than the hours currently necessary, is a crucial step toward developing bio-attack warning systems and defenses such as foam dispersal systems in public facilities similar to the PROTECT system that is being deployed in the Washington Metro and other locations. We have applied for a patent on this detector and expect to license the technology to industry for commercial development and manufacture. Sandia's Laboratory-Directed Research and Development program supported this work.

Sandia is engaged in an accelerated development effort for a standoff biological weapons detection system to provide advance warning of a biological weapon threat. The system will employ ultraviolet laser-induced fluorescence to scan for and to discriminate clouds of biological agents over a broad field of view. Prototypes of this system have been demonstrated on various mobile and fixed platforms and have demonstrated excellent standoff range and sensitivity. Under NNSA sponsorship, we are moving toward the demonstration phase of the system development in the next several months.

Explosives Detection

Today, a commercially produced, walk-through portal for detecting trace amounts of explosive compounds on a person is available for purchase and installation at airports and other public facilities. The technology for this device was developed, prototyped, and demonstrated by Sandia National Laboratories over a period of several years and licensed to Barringer Instruments of Warren, New Jersey, for commercialization and manufacture. The instrument is so sensitive that microscopic quantities of explosive compounds are detected in a few seconds.

Using similar technology, we have developed and successfully tested a prototype vehicle portal that detects minute amounts of common explosives in cars and trucks. Detecting explosives in vehicles is a major concern at airports, military bases, government facilities, and border crossings. The system uses Sandia's patented sample collection and preconcentrator technology that has previously been licensed to Barringer for use in screening airline passengers. The same technology has been incorporated into Sandia's line of "Hound™" portable and hand-held sensors, capable of detecting parts-per-trillion explosives and other compounds. These devices can be of great value to customs and border agents at ports of entry.

Bomb Disablement Technology and Training

As *first* responders, American firefighters, police, and emergency personnel will be called upon to be America's first line of defense against terrorist attacks. These men and women must be prepared for the full range of terrorist threats, from improvised explosive devices to chemical, biological, radiological, and nuclear weapons of mass destruction. It will be the responsibility of the Department of Homeland Security to ensure their preparedness by providing them with the training and tools they need to do their jobs.

Sandia National Laboratories began holding advanced bomb-disablement technology workshops for bomb squad technicians in 1994. Since then, Sandia has transferred advanced bomb-disablement technology to more than 750 workshop participants through *Operation America* and its predecessors, *Operation Riverside* and *Operation Albuquerque*. *Operation America* is a series of ongoing regional workshops hosted by a local police department in the state where the event is held and supported by regional FBI offices. Participants come from bomb squads, police and fire departments, and emergency response organizations throughout the United States, including most of our major metropolitan cities and the U.S. Capitol Police. They also come from other government agencies, all branches of the U.S. military, and, internationally, from our allies in some of the world's terrorism hotspots. Participants come to learn applied explosives technology and advanced bomb-disablement logic, tools, and techniques. Technical classroom presentations, live-range demonstrations, hands-on training, and special high-risk scenarios give them the knowledge and technology they need to respond to terrorist threats involving explosives.

Most of the bomb-disablement technologies demonstrated in Operation America were developed by Sandia National Laboratories as part of the DOE Laboratory-Directed Research and Development program and our work for other federal agencies. These tools include the Percussion-Actuated Nonelectric (PAN) Disrupter used to dismantle suspected explosive devices and preserve forensic evidence. The device was used at the Unabomber's cabin in Montana and was available at the 1996 Summer and 2002 Winter Olympic Games. More recently, Massachusetts State Police, with the assistance of the FBI, used the Sandia-developed PAN Disrupter to disable the alleged shoe bombs removed from an American Airlines flight from Paris to Miami.

The PAN disrupter, as well as other advanced disablement tools developed by Sandia, are currently in use by local bomb squads and could be used against terrorist threats such as radiological dispersal devices (RDDs) and other weapons of mass destruction. Most of these bomb-disablement tools are relatively simple to assemble in the field, can be used safely from a distance, and are affordable, and they are currently in use throughout the bomb-disablement community. These tools disrupt and "render-safe" explosive packages without initiating the explosives or destroying forensic evidence.

Once Sandia has researched, developed, and tested a bomb-disablement tool, it begins the process of transferring the technology to the first-responders community, putting the technology in the hands of the men and women who need it. Operation America sponsors include Sandia National Laboratories, the National Institute of Justice, and DOE.

Critical Infrastructure Protection

National security and the quality of life in the United States rely on the continuous, reliable operation of a complex set of interdependent infrastructures consisting of electric power, oil and gas, transportation, water, communications, banking and finance, emergency services, law enforcement, government continuity, agriculture, health services, and others. Today, they are heavily dependent on one another and becoming more so. Disruptions in any one of them could jeopardize the continued operation of the entire infrastructure system. Many of these systems are known to be vulnerable to physical and cyber threats and to failures induced by system complexity.

In the past, the nation's critical infrastructures operated fairly independently. Today, however, they are increasingly linked, automated, and interdependent. What previously

would have been an isolated failure, today could cascade into a widespread, crippling, multi-infrastructure disruption. As the documented cases of attacks on vital portions of the nation's infrastructure grow, there is a sense of urgency within industry and government to understand the vulnerabilities.

The National Infrastructure Simulation and Analysis Center (NISAC)—which would be transferred to the Department of Homeland Security under the Administration's bill—is a comprehensive capability to assess the nation's system of infrastructures and their inter-dependencies. NISAC's partners are Sandia National Laboratories and Los Alamos National Laboratory, both of which possess extensive supercomputer resources and soft-ware expertise. NISAC will provide reliable decision support analysis for policy makers, government leaders, and infrastructure operators. It will perform modeling, simulation, and analysis of the nation's infrastructures, with emphasis on the interdependencies.

Sandia pioneered probabilistic risk assessment (PRA) as a tool for evaluating the risks associated with high-consequence systems such as nuclear weapons and nuclear power generation plants. We apply this tool to risk assessments for critical infrastructures such as dams, water utilities, chemical plants, and power plants. Combined with our expertise in security systems for nuclear facilities, we have helped utilities and industrial associations create security assessment methodologies that can guide owners and operators through the assessment process to determine vulnerabilities and identify mitigation options. Methodologies have been developed for water utilities, chemical storage facilities, dams, power plants, and electrical power transmission systems.

Cyber Sciences

Computer systems and networks are attractive targets of attack by terrorists, foreign governments, or high-tech criminals. Government functions, commerce, and the military increasingly rely on cyber networks in their operations. Computerized supervisory control and data acquisition (SCADA) systems often control the operations of critical infrastruc-tures such as power utilities and distribution networks and municipal water supplies.

Sandia has significant activities in the technologies intended to protect cyber and net-work resources and the information that resides on such systems. Programs that assess the vulnerabilities associated with these systems are in place for our own resources as well as for those at other federal government agencies. Sandia operates a SCADA laboratory to

study such cyber control systems and to determine effective protection strategies. We conduct red-teaming to challenge cyber and information systems and identify and remove vulnerabilities. Our objectives are to enhance the robustness of cyber systems and critical information systems and develop solutions for survivability and response options for systems under attack. Our understanding of the issues associated with computer and network vulnerabilities is enhanced by the microelectronic design and fabrication capability resident at Sandia as well as the state-of-the-art work performed as part of NNSA's Advanced Simulation and Computing (ASC) campaign.

NUCLEAR INCIDENT RESPONSE

The President's bill to establish a Department of Homeland Security defines a Nuclear Incident Response Team that includes entities of the Department of Energy and the Environmental Protection Agency that perform nuclear and/or radiological emergency support functions (Section 504).

NNSA plays a vital support role in combating acts of nuclear terrorism through its Nuclear Emergency Support Team (NEST). NEST provides the FBI and other federal and state agencies with technical assistance in response to terrorist use or threat of use of a nuclear or radiological device in the United States. NEST also supports the Department of State in a similar role for incidents overseas. Another NNSA team, the Accident Response Group (ARG), has the different mission of providing technical support in response to accidents involving U.S. nuclear weapons while they are either in the custody of DOE or the military services. The ARG and NEST teams draw from the same pool of experts at the NNSA laboratories, all of whom are volunteers.

NEST maintains a fast-response capability for a radiological emergency involving dispersal of radioactive debris—for example, from the detonation of a so-called "dirty bomb" or radiological dispersal device (RDD). The NNSA's Radiological Assistance Program (RAP) provides initial responders who can be on the scene in a matter of hours. Their support role is to characterize the radiological environment, provide technical advice to the FBI, FEMA, and other emergency response agencies, and to assist with decontamination and material recovery. NNSA is in the process of enhancing the Radiological Assistance Program to perform radiological weapons detection and device characterization missions on a regional basis consistent with the FEMA response regions.

The Joint Technical Operations Teams (JTOTs) are major operational elements of NEST that directly assist military units and crisis response operations. These teams are trained and equipped to support render-safe operations and advise on stabilization, packaging, and disposition procedures.

In addition to the NEST and ARG capabilities, NNSA maintains Consequence Management Teams that are available to provide assistance to federal and state agencies that require radiological emergency assistance after an event has occurred. The teams are trained and equipped to support incident assessment, monitoring and sampling activities, laboratory analysis, and health and safety support to incident responders.

Sandia National Laboratories contributes approximately ninety team members to the various elements of NEST, ARG, RAP, and Consequence Management. Sandia's role focuses largely on RAP incident response, device characterization, render-safe techniques, assessment and prediction of consequences from radiological incidents and accidents, and methods for containment of radiological materials. Sandia is the only NNSA laboratory that maintains the capability for containment of particulates that would be released in an RDD explosion.

The President's bill would place the Nuclear Incident Response Team under the authority and control of the Secretary of Homeland Security during an actual or threatened terrorist attack or other emergency. During such a time, it would operate as an organizational unit of the Department of Homeland Security. At all other times, DOE/NNSA would be responsible for organizing, training, equipping, and exercising authority and control over NEST, ARG, and the Consequence Management Teams. This arrangement is not ideal, but it makes sense in this case because the volunteer NEST and ARG experts are integrated with the nuclear design activities of the DOE/NNSA laboratories. It would not be possible, for example, to transfer the NEST/ARG functions to the Homeland Security Department on a permanent basis because the personnel who constitute those teams are full-time weapon scientists, engineers, and technicians.

Consequently, it will be important to establish and exercise a clearly understood process for deploying the Nuclear Incident Response Team elements to avoid interagency conflicts over roles and authorities. The process should be designed to minimize the layers of federal offices involved in both management and deployment.

SCIENCE AND TECHNOLOGY DEVELOPMENT FOR HOMELAND SECURITY MISSIONS

The national laboratories of the NNSA are widely regarded as the premier science and technology laboratories in the federal government. These institutions have a long history of excellence in research and development in nuclear weapons and other national security applications. They are uniquely able to deploy multidisciplinary teams on complex problems in a way that integrates science, engineering, and design with product.

In a world where threats are increasingly insidious—with worrisome developments in chemical and biological weapons, cyber warfare, and proliferation—it is important that the NNSA laboratories be major contributors in the national effort to address these threats. These national laboratories can provide enormous value to homeland security challenges. They are also the logical entities to perform technology evaluation on the many products and proposals that will inevitably be advocated to the Department of Homeland Security from countless vendors.

Unfortunately, established bureaucratic structures and regulations that insulate agencies from one another will stand in the way of effective utilization of the NNSA laboratories for homeland security unless legislative action is taken to remove the barriers. As a first step, it would be helpful to explicitly authorize NNSA to carry out research and development for homeland security by adding that activity to the NNSA's authorized missions listed at Title 42, Section 2121 of the United States Code. Next, the Homeland Security Act should give the Department of Homeland Security the power to task the NNSA laboratories directly, just as the Science, Energy, Environmental, and other non-NNSA offices of DOE are able to do. That authority would eliminate the bureaucratic red tape and additional costs associated with the Work-for-Others (WFO) process that inhibits access and utilization of the laboratories by non-DOE sponsors.

It will be important for the Homeland Security Department to have the authority to determine for itself how and where to make its research and development investments to support its mission goals. There will be some laboratories and institutions that will seek to be designated as homeland security laboratories or as centers of excellence for this or that homeland security mission area. The Department will need to look beyond labels to demonstrated capabilities and a track record of deliverables. Its research and development program should encourage a competition of ideas among many performers, including

industrial firms, universities, and federal laboratories, and then fund the development of the best ideas based on considerations of technical merit and not on who the performer is. The Defense Advanced Research Projects Agency (DARPA) uses such an approach, and it may be an effective model for the Homeland Security Department to emulate.

Under the President's bill, the research and development program for the entire Department would be directed by the Under Secretary for Chemical, Biological, Radiological, and Nuclear Countermeasures. Certainly that official will have formidable R&D challenges, but he or she must also be cognizant of the science and technology needs for the other mission areas of homeland security, including information analysis and infrastructure protection, borders and transportation security, and emergency preparedness and response. As an alternative, it may be useful to consider a chief scientist position reporting to the Secretary with authority for coordinating and directing the Department's overall research and development program. Each Under Secretary may benefit from a dedicated R&D element focused on the challenges peculiar to his mission.

SUMMARY AND CONCLUSION

Sandia National Laboratories and the other NNSA laboratories constitute a broad, multidisciplinary technology base in nearly all the physical sciences and engineering disciplines. We are eager to leverage those capabilities to support the science and technology needs of the Department of Homeland Security when our capabilities can make significant contributions.

Sandia possesses strong competencies in nuclear, chemical, and biological sensors and engineered systems suitable for transfer to industry and deployment in homeland security applications. We have been proactive in supporting our nation's first responders and addressing the challenges of infrastructure protection. We have a track record of anticipating emerging homeland security threats and investing in technology development to counter them through our Laboratory-Directed Research and Development program and sponsor-directed programs. We are one of the premier laboratories for working with industry to transition laboratory technologies into deployable commercial applications.

Bureaucratic and regulatory roadblocks exist that limit access to the DOE/NNSA national laboratories by other federal agencies, and those obstacles should be removed by the homeland security legislation in order to facilitate direct access to those resources. The

Homeland Security Department needs the authority to manage a research and development program that encourages competition of ideas among many performers—including industrial firms, universities, and federal laboratories—and then fund the development of the best ideas based on technical merit and applicability to mission needs.

On behalf of the dedicated and talented people who constitute Sandia National Laboratories, I want to emphasize our commitment to strengthening United States security and combating the threat to our homeland from terrorism and weapons of mass destruction. It is our highest goal to be a national laboratory that delivers technology solutions to the most challenging problems that threaten peace and freedom.

Thank you, Mr. Chairman. I would be pleased to respond to any questions you may have.

WITNESS DISCLOSURE INFORMATION

Witness name: K. David Nokes

Capacity in which appearing: Representative of a non-government entity

Name of entity being represented: Sandia National Laboratories (GOCO)

Position held: Director, Systems Assessment and Research Center

Parent organization (managing contractor): Lockheed Martin Corporation

Federal contract: Management and operating contract between Sandia Corporation and U.S. Department of Energy, DE-AC04-94AL85000.

FY2000 cost: $1,540,019,000; negotiated fee: $16,110,000.

FY2001 cost: $1,580,187,000; negotiated fee: $16,300,000.

FY2002 cost: $1,684,552,000; negotiated fee: $17,270,000.

Career biography:

K. David Nokes is Director of the Systems Assessment and Research Center at Sandia National Laboratories in Albuquerque, New Mexico, which performs analysis and design activities in support of the Intelligence Community. Effective July 2002, Mr. Nokes was appointed Vice President of Sandia's National Security & Arms Control Division with responsibility for the laboratory's arms control, threat assessment, security technology, nonproliferation, and international programs.

Mr. Nokes was a member of Sandia National Laboratories' nuclear weapons program from 1960 to 1989. He designed various electro-mechanical and explosive systems for both conventional and nuclear weapon systems. In 1982, he was named Supervisor of the W81 Standard Missile 2 (SM2) Navy Tactical Warhead Development Division. In 1984, he was assigned as supervisor of Sandia Albuquerque's Phase I and 2 Division, managing all nuclear weapons system's concept and feasibility studies.

In 1989, Nokes was appointed Special Scientific Advisor to the Assistant to the Secretary of Defense (Atomic Energy), providing advice on nuclear weapon safety, security, and reliability issues. In 1991, he was named Manager of the Trident Department with responsibility for Sandia's development and production activities for the Navy's strategic nuclear weapons, the W76 and W88 warheads, and the Mark 5 arming, firing, and fuzing system. Mr. Nokes became Manager of Sandia's Surety Technology Program in 1992, managing all research and development activities for nuclear weapon safety, security, control, and assessment. In 1993, he was designated as Manager of Sandia's Cooperative Measures Program, responsible for developing programs of cooperation with the former Soviet Union, including Lab-to-Lab activities with Russia's Nuclear Weapon Laboratories, the Safe Secure Dismantlement program, and Sandia's involvement in other government technical cooperative activities.