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And the
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"Not a Matter of 'If', But of 'When': The Status of U.S. Response Following an RDD Attack"

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Chairman Akaka, Chairman Pryor, Senator Voinovich, Senator Sununu, members of the Subcommittees, thank you for the opportunity to appear before you today to discuss the U.S. response to a terrorist attack involving a radiological dispersal device (RDD) and, in particular, the Department of Energy/National Nuclear Security Administration's (DOE/NNSA) capabilities to mitigate the effects of such an attack. DOE/NNSA is an important part of an interagency effort that would work in close collaboration with DHS, EPA, and other Federal, state, local, and tribal government agencies to protect the public and help the country recover if an attack ever takes place. Our particular strength is the scientific and technical expertise we draw from our national laboratory system, including the nuclear knowledge developed over 50 years of managing the nation's nuclear weapons program. Many of our best scientists, engineers, and technicians volunteer to staff the teams that form the core of our contribution to a coordinated interagency RDD or other emergency response.

Before describing those teams and their capabilities in greater detail, I would note that DOE/NNSA is continuing to make major efforts to *prevent* an RDD attack against the United States. Through our Global Threat Reduction Initiative (GTRI), we have secured radioactive materials at over 600 sites around the world. Within the U.S., GTRI is collaborating with the USDA and other federal agencies to enhance the security of sources used in industrial, blood and research irradiators and other medical devices. This security enhancement is achieved through training seminars conducted by DOE/NNSA specialists and the installation of security systems. Moreover, GTRI has recovered over 15,000 unneeded or abandoned radioactive sources and arranged for their safe and secure disposal. As part of the DOE/NNSA Second Line of Defense and MegaPorts Programs, DOE/NNSA installs radiation detection equipment at land border crossings, sea ports, and airports around the world, and supports DHS programs that scan people and cargo entering the U.S. to detect illicitly-transported radioactive materials. We also maintain a capability to search for such materials, should we receive an intelligence or law enforcement tip-off to their general location.

When the need arises, DOE/NNSA is prepared to respond immediately to any type of radiological accident or incident anywhere in the world with specialized equipment and trained people. Our emergency response teams work within the framework defined by the National Response Plan and generally support another Federal agency responsible for overall incident management or investigation of a terrorist attack. In the event of a radiological dispersal device detonation, the following five DOE/NNSA assets would provide consequence management support.

The mission of the Radiological Assistance Program (RAP) is to provide a flexible, around the clock response capability to Federal agencies, state, tribal, and local governments, and to private businesses or individuals for incidents involving radiological materials. RAP teams are capable of providing assistance in all types of radiological incidents with support capabilities ranging from giving technical information or advice over the telephone to sending highly trained people and state-of-the-art equipment to the accident site to help identify and minimize radiological hazards. In addition to providing radiological emergency assistance, RAP can provide emergency response training to state and local first responders, upon request. There are 28 regionally based RAP teams across the U.S., so a RAP team would typically be the first specialized team on the scene of a radiological emergency. RAP team members normally arrive at the scene within four to six hours after notification and conduct the initial radiological assessment of the area. They would assess the situation and advise decision-makers on what actions to take to minimize the hazards. RAP team members are trained in the hazards of radiation and radioactive materials to provide initial assistance to minimize immediate radiation risks to people, including assisting in decontamination efforts. RAP would remain on scene and provide continuing radiation monitoring support, of both people and the environment.

The Aerial Measuring System (AMS) mission is to provide rapid response to radiological emergencies with helicopters and fixed-wing aircraft equipped to detect and measure radioactive material deposited on the ground. AMS is based and operated out of Nellis Air Force Base in Las Vegas, with additional operating capability at Andrews Air Force Base near Washington, DC. AMS aircraft carry radiation detection systems which provide real-time measurements of extremely low levels of ground and airborne contamination. AMS can also provide detailed aerial photographs and multi-spectral imagery and analysis of an accident site. In the event of an accident or incident involving radiological materials, DOE/NNSA in consultation with state and/or other Federal partners will deploy AMS immediately to the accident site. The fixed-wing aircraft will normally arrive first. It is used to determine the path of the radioactive plume and the location of any ground contamination. AMS helicopters are slower and able to travel at lower altitudes, typically 150 feet, thus allowing more detailed surveys of any ground contamination.

The Interagency Modeling and Atmospheric Assessment Center (IMAAC) develops predictive plots generated by sophisticated computer models. IMAAC, based at Lawrence Livermore National Laboratory, provides near real-time modeling of hazardous materials released into the atmosphere thereby helping emergency response officials determine the appropriate measures to protect people. IMAAC's computer-based system provides realistic plots, or maps, of potential radiation dose and exposure assessments, and estimates of the path of nuclear contaminants released into the atmosphere. IMAAC builds the initial plots based on current regional and site weather data and information from emergency officials near the scene, such as the exact time and location of the incident. This information is combined with computer codes simulating the release from the explosion with dispersion models which show the anticipated spread of the material. These dispersion models take into consideration the effects on plume distribution due to the local terrain or topography and complex meteorology. The IMAAC plots would continue to be refined over the next several hours and days as additional information becomes available, such as the type of radiological material and actual AMS and RAP ground measurements, would be included in the calculations.

The Federal Radiological Monitoring and Assessment Center's (FRMAC) mission is to coordinate and manage all Federal radiological monitoring and assessment activities during major radiological emergencies within the US in support of state, tribal and local governments. The DOE/NNSA Consequence Management response is in two phases. Phase I consists of technical and management personnel who would review the seriousness of the situation and identify the best location to locate the FRMAC. The Phase I team initiates all technical components of a FRMAC response and is soon reinforced by Phase II and our interagency partners. The full interagency FRMAC can be operational in 24-36 hours after the initial request from the state government or DHS. A FRMAC's size is tailored to the event and may consist of as few as 60 or as many as 500 people, depending on the needs of the situation. Initial environmental monitoring is focused on the protection of the public and the investigation of the type, amount, and extent of the radiological release. Monitoring continues until all of the area where radioactivity was released is fully evaluated. FRMAC activities include: coordinating federal radiological environmental monitoring and assessment activities; maintaining technical liaison with state, tribal and local governments; maintaining a common set of all radiological monitoring data; and providing monitoring data and interpretations. NNSA will transfer responsibility of managing the FRMAC to the Environmental Protection Agency (EPA) at a mutually agreeable time following the emergency phase. NNSA and other Federal agencies will continue to provide resources for as long as is necessary to complete the Federal response.

Lastly, the Radiation Emergency Assistance Center/Training Site (REAC/TS) located in Oak Ridge, Tennessee, is focused on providing rapid medical attention to people involved in radiation accidents. REAC/TS is on call 24 hours a day to provide direct or consultative help with medical and health physics problems due to local, national, or international incidents. REAC/TS provides direct support, including deployable equipment and personnel trained and experienced in the treatment of radiation exposure, to assist Federal, state, tribal and local organizations. The REAC/TS staff also provides training in the treatment of radiation exposure to national and foreign medical, nursing, paramedical, and health physics professionals. In 1980, REAC/TS was named a World Health Organization (WHO) Collaboration Center for Radiation Emergency Assistance.

As a WHO Collaborating Center, REAC/TS is prepared to: serve as a central point for advice and possible medical care in cases of radiation injuries; set up a network of available equipment and staff specializing in radiopathology; develop medical emergency plans in the event of a large-scale radiation accident; prepare radiation document and guidelines; and, provide consultation or direct medical assistance.

All of these DOE/NNSA assets are designed for rapid response. RAP is usually the first NNSA responder for assessing the emergency situation and deciding what further steps should be taken to minimize the hazards of a radiological emergency. AMS detects, measures and tracks radioactive material at an emergency to determine contamination levels. NARAC develops predictive plots generated by sophisticated computer models. FRMAC coordinates the Federal radiological monitoring and assessment activities with those of state and local agencies. REAC/TS provides treatment and medical consultation for injuries resulting from radiation exposure and contamination. Each of these assets handles certain aspects of the radiological emergency and together provides a comprehensive, integrated response.

Another area in which the DOE/NNSA provides specialized assistance is technical nuclear forensics and attribution. In the case of an RDD, technical nuclear forensics is the thorough forensic analysis and characterization of radiological samples taken from the device or the debris field. Following the detonation or interdiction of an RDD, the process of forensics and attribution would begin. After dispersal, upon request of the FBI, the NNSA would deploy a DOE/NNSA Forensics Operations (DFO) team capable of supporting technical nuclear forensics debris collection and providing subject matter expertise. Following collection, the FBI utilizes the DOE/NNSA national laboratory complex for laboratory analysis of samples.

The objective of nuclear attribution is to identify the nature and source of nuclear and radiological materials used, determine the origin and, and ultimately to identify those responsible for an attempted or actual attack. Nuclear attribution, a very lengthy process, utilizes many inputs, including results from nuclear forensic sample analyses, an understanding of radiochemical signatures, an understanding of environmental signatures, knowledge of the methods for production of radiological sources, intelligence sources and information from law enforcement.

The United States, Canada and Russia are the three main producers of commercial radioactive sources. There are many industries that use radioactive sources, including construction, food processing, medical diagnostics and treatment, and printing. Therefore, unlike Special Nuclear Materials which could have only a few origins and are typically kept under very tight security, radiological sources are very common and relatively easy to obtain, legally or illegally. The attribution process following an RDD using one or more commercial sources would primarily provide clues or leads to law enforcement to inform the forensics investigation rather than providing definitive answers.

Commercial sources are widely available and vary significantly in both the level and type (i.e., alpha, beta, gamma) of radiation that they emit and, therefore, vary in the potential radiological hazard that they pose to people and to the environment. Sources with low levels of radioactivity, such as the Americium sources used in smoke detectors, tend to be more widely available and less tightly controlled than sources with high levels of radioactivity, such as Cobalt sources used in nuclear medicine. Correspondingly, the threat posed by the low-level sources is much less than that posed by the high-level sources.

High-level commercial radioactive sources present technical difficulties for an individual interested in building an RDD. The same high level of radioactivity that makes them attractive material for use in an RDD also makes them dangerous to the terrorist who transports the material or fashions it into an RDD. The most intense radiation sources might kill or disable even a suicide bomber before he could complete his work.

It should be noted that the scale of the consequences resulting from the detonation of an RDD would be far less than a detonation involving fissionable nuclear materials (an Improvised Nuclear Device). Whereas a nuclear detonation would cause catastrophic casualties and environmental and property damage, detonation of an RDD would primarily cause panic and economic consequences. In general terms, individuals who survive the explosion are unlikely to suffer radiation sickness or die from radiation exposure in the immediate future. Depending on the radioisotope type and quantity, their proximity to the device and amount of internal radiation uptake, some individuals in the area may have a significantly increased risk of developing certain types of cancers while others will be at only a slightly increased risk. Furthermore, the economic consequences, depending on the incident site and extent of remediation required, could have devastating effects on the local economy, with impacts on a national scale.

Thank you for your attention; I would be happy to take questions.

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