United States Government Accountability Office

GAO

Report to the Chairman, Subcommittee on National Security, Emerging Threats and International Relations, Committee on Government Reform, House of Representatives

September 2006

COMBATING NUCLEAR TERRORISM

Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Emergency Response Capabilities Could Be Strengthened

GAO-06-1015

September 2006

COMBATING NUCLEAR TERRORISM

Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Emergency Response Capabilities Could Be Strengthened

GAO Accountability·Integrity·Reliability

Highlights

Highlights of GAO-06-1015, a report to the Chairman, Subcommittee on National Security, Emerging Threats and International Relations, Committee on Government Reform, House of Representatives

Why GAO Did This Study

The Department of Energy (DOE) maintains an emergency response capability to quickly respond to potential nuclear and radiological threats in the United States. This capability has taken on increased significance after the attacks of September 11, 2001, because there is heightened concern that terrorists may try to detonate a nuclear or radiological device in a major U.S. city. This report discusses (1) the capabilities and assets DOE has to prevent and respond to potential nuclear and radiological attacks in the United States, (2) the physical security measures in place at DOE's two key emergency response facilities and whether they are consistent with DOE guidance, and (3) the benefits of using DOE's aerial background radiation surveys to enhance emergency response capabilities.

What GAO Recommends

GAO recommends, among other things, that (1) DOE review the physical security measures at its two key emergency response facilities to determine whether additional measures should be taken to protect the facilities and (2) DOE and the Department of Homeland Security (DHS) evaluate the costs, benefits, and limitations of making greater use of aerial background radiation surveys of U.S. cities. DHS agreed and DOE neither agreed nor disagreed with our recommendations. DOE raised concerns about our finding on security measures.

www.gao.gov/cgi-bin/getrpt?GAO-06-1015.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

What GAO Found

DOE has unique capabilities and assets to prevent and respond to a nuclear or radiological attack in the United States. These include specialized teams to search for, locate, and deactivate nuclear or radiological devices and to help manage the consequences of a nuclear or radiological attack. These capabilities are primarily found at DOE's two key emergency response facilities—the Remote Sensing Laboratories at Nellis Air Force Base, Nevada, and Andrews Air Force Base, Maryland.

DOE's two Remote Sensing Laboratories are protected at the lowest level of physical security allowed by DOE guidance because, according to DOE, capabilities and assets to prevent and respond to nuclear and radiological emergencies have been dispersed across the country and are not concentrated at the laboratories. However, we found a number of critical capabilities and assets that exist only at the Remote Sensing Laboratories and whose loss would significantly hamper DOE's ability to quickly prevent and respond to a nuclear or radiological emergency. These capabilities include the most highly trained teams for minimizing the consequences of a nuclear or radiological attack and the only helicopters and planes that can readily help locate nuclear or radiological devices or measure contamination levels after a radiological attack. Because these capabilities and assets have not been fully dispersed, current physical security measures may not be sufficient for protecting the facilities against a terrorist attack.

There are significant benefits to conducting aerial background radiation surveys of U.S. cities. Specifically, the surveys can be used to compare changes in radiation levels to (1) help detect radiological threats in U.S. cities more quickly and (2) measure contamination levels after a radiological attack to assist in and reduce the costs of cleanup efforts. Despite the benefits, only one major city has been surveyed. Neither DOE nor DHS has mission responsibility for conducting these surveys, and there are no plans to conduct additional surveys.

DOE Helicopter Conducting an Aerial Background Radiation Survey

Source: DOE.

Contents

Abbreviations

AEC	Atomic Energy Commission
DHS	Department of Homeland Security
DNDO	Domestic Nuclear Detection Office
DOE	Department of Energy
FBI	Federal Bureau of Investigation
NEST	Nuclear Emergency Search Team
NNSA	National Nuclear Security Administration
NYPD	New York City Police Department
RAP	Radiological Assistance Program

GAO
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, D.C. 20548

September 21, 2006

The Honorable Christopher Shays
Chairman
Subcommittee on National Security, Emerging Threats
and International Relations
Committee on Government Reform
House of Representatives

Dear Mr. Chairman:

The Department of Energy (DOE) has maintained an emergency response capability to quickly respond to potential nuclear and radiological threats in the United States. This capability has taken on increased significance after the attacks of September 11, 2001, because there is heightened concern that terrorists may try to smuggle nuclear or radiological materials into the United States and detonate a nuclear or a radiological dispersal device, otherwise known as a dirty bomb, in a major U.S. city. Detonating either type of device would have serious consequences for our national and economic interests, including potentially causing numerous deaths and undermining citizens' confidence in the government's ability to protect the homeland.

To respond to such threats, DOE has developed the technical expertise to search for and locate potential nuclear and radiological threats in U.S. cities and also to help minimize the consequences of a radiological incident by, among other things, measuring the extent of contamination. After September 11, 2001, DOE began dispersing its emergency response capabilities across the country. However, a number of critical capabilities and assets are primarily concentrated at two key facilities, known as Remote Sensing Laboratories, located at Nellis Air Force Base, Nevada, and Andrews Air Force Base, Maryland. These two facilities house, among other things, specialized search teams that locate and identify nuclear and radiological devices; planes and helicopters used to measure contamination; and research and development laboratories that design specialized equipment. DOE requires that these facilities be adequately

protected with security measures to defend against potential terrorist attacks.[1]

One of DOE's unique capabilities is the ability to conduct aerial background radiation surveys. These surveys are conducted by using helicopters or planes equipped with radiation detectors to fly over an area and collect information on existing background radiation sources, such as granite statues in a city or medical isotopes located at hospitals. This can help DOE establish baseline radiation levels against which future radiation levels can be compared in order to more easily detect new radiation sources that may pose a security or public health threat.

DOE is not the only federal agency responsible for detecting nuclear and radiological materials. The Department of Homeland Security (DHS) has a Domestic Nuclear Detection Office (DNDO) that is responsible for developing, testing, and deploying radiation detection equipment to detect and prevent the smuggling of nuclear and radiological materials at U.S. points of entry, such as seaports and border crossings. DNDO is also responsible for helping state and local governments improve their capability to detect and identify illicit nuclear and radiological materials. If DHS cannot prevent the smuggling of nuclear or radiological materials into the United States, it relies on DOE's emergency response capabilities to search for and locate the materials.

In this context, this report discusses (1) the capabilities and assets DOE has to prevent and respond to potential nuclear and radiological attacks in the United States, (2) the physical security measures in place at DOE's two key emergency response facilities and whether they are consistent with DOE guidance, and (3) the benefits of using DOE's aerial background radiation surveys to enhance emergency response capabilities.

To address these objectives, we collected and analyzed documentation related to DOE's emergency response capabilities and assets and the physical security guidelines and plans for its two key emergency response facilities. We interviewed officials from DOE's Office of Emergency Response and the Office of Independent Oversight. We also interviewed program managers and security officials from the Remote Sensing

[1]DOE uses different levels of physical protection to secure its facilities. The levels of protection are specific to the type of security interests and the significance of the targets. They are provided in a graded fashion in accordance with potential risks.

Laboratories at Nellis and Andrews Air Force Bases, and we received a tour of these facilities to view the physical security measures and obtain a demonstration of their radiation detection equipment. In addition, we analyzed documents and interviewed officials from DOE's national laboratories at Brookhaven (in New York), Sandia (in New Mexico), and Savannah River (in South Carolina), where emergency response assets have been dispersed. To obtain information on aerial surveys, we analyzed documents and interviewed officials from the Counter Terrorism Bureau of the New York City Police Department who requested an aerial background radiation survey of New York City. We also collected documentation and interviewed officials from DHS's Domestic Nuclear Detection Office and Office of Grants and Training to obtain information on DHS's role in conducting and funding aerial background radiation surveys. We conducted our work from January to August 2006 in accordance with generally accepted government auditing standards.

Results in Brief

DOE has unique capabilities and assets to prevent and respond to a nuclear or radiological attack in the United States. These include specialized teams to search for, locate, and deactivate nuclear or radiological devices and to help minimize the consequences of a nuclear or radiological attack. These capabilities are primarily found at DOE's two key emergency response facilities—the Remote Sensing Laboratories at Nellis Air Force Base, Nevada, and Andrews Air Force Base, Maryland. DOE also draws upon the technical expertise of scientists, engineers, and technicians from the national laboratories, including Los Alamos, Sandia, and Lawrence Livermore. To prevent an attack, search teams use a variety of clandestine and discreet methods, including the use of radiation sensors carried in backpacks and mounted on vehicles and helicopters, to detect and locate radiological sources. In fiscal year 2005, DOE conducted about 30 search missions to address potential radiological threats or to assist local and state officials in monitoring large public events such as the Super Bowl and the State of the Union address. DOE officials cautioned, however, that it may be difficult to detect certain nuclear or well-shielded radiological materials. In order to deploy teams more quickly, since the attacks of September 11, 2001, DOE has expanded its search capability beyond the Remote Sensing Laboratories to include eight other emergency response sites across the country. In the event of a nuclear or radiological attack, DOE also maintains capabilities to minimize the consequences. DOE can deploy teams that use radiation-monitoring equipment, including sensors mounted on aircraft and vehicles, to detect and measure radiation contamination levels and provide information to state and local officials on

what areas need to be evacuated. DOE can also coordinate federal activities related to monitoring contamination levels and mobilize medical personnel to treat injuries resulting from radiation exposure.

DOE's two Remote Sensing Laboratories are protected at the lowest level of physical security allowed by DOE guidance because, according to DOE, emergency response capabilities and assets have been dispersed across the country and are not concentrated at the laboratories. Under DOE policy guidance for safeguarding and securing facilities issued in November 2005, DOE facilities can be protected at the lowest level of physical security if their capabilities and assets exist at other locations and can be easily and quickly reconstituted. However, we found that there are a number of critical capabilities and assets that exist only at the Remote Sensing Laboratories and their loss would significantly hamper DOE's ability to quickly prevent or respond to a nuclear or radiological emergency. Specifically, the capabilities and assets that are located only at the laboratories include, among other things, the most highly trained teams that help manage and minimize the consequences of a nuclear or radiological attack and the only helicopters and planes that can readily help locate nuclear or radiological devices and measure contamination levels after a radiological attack. Since these capabilities and assets have not been fully dispersed, current physical security measures may not be sufficient to protect the facilities against a terrorist attack. Under DOE's physical security guidance, a facility in the lowest level of physical security can meet the requirements by having walls and doors but no other physical security measures. For example, the Remote Sensing Laboratory at Andrews Air Force Base does not have a fence, vehicle barriers, or any other protective measures around the building, but DOE has determined that it meets physical security requirements. Furthermore, while the laboratories' location on Air Force bases may appear to provide an additional level of security, access onto Nellis and Andrews Air Force Bases is not strictly limited, and anyone with federal government identification may gain entry. In fact, GAO staff gained access to the bases multiple times with little or no scrutiny of their identification. Security officials told us that the laboratories are not designed to withstand certain types of terrorist attacks. However, officials have not taken any steps to strengthen security because of DOE's assumption that their capabilities and assets are fully dispersed. Furthermore, DOE has not developed contingency plans that would identify capabilities and assets that would be used in the event that one or both Remote Sensing Laboratories were attacked.

There are significant benefits to conducting aerial background radiation surveys of U.S. cities. Specifically, the surveys can be used to compare changes in radiation levels to (1) help detect radiological threats in U.S. cities more quickly and (2) measure contamination levels after a radiological attack to assist in and reduce the costs of cleanup efforts. Despite the benefits, there has been only one survey of a major U.S. city because neither DOE nor DHS has mission responsibility for conducting the surveys. In the event of a dirty-bomb threat, if a city had a completed survey, DOE could then conduct a new survey and compare baseline radiation data from the previous survey to identify locations with new sources of radiation. Focusing their attention on these new locations, law enforcement officials may be able to locate a nuclear or radiological device more quickly. In addition, using baseline information from a prior survey, DOE could assess contamination levels after a radiological attack to assist cleanup efforts. DOE officials estimated that information from the surveys could save millions of dollars in cleanup costs because cleanup efforts could be targeted to decontaminating buildings and other areas up to pre-existing levels of radiation rather than fully removing all traces of radiation. Without baseline information from the surveys, law enforcement officials may lose valuable time investigating pre-existing sources of radiation that do not pose a threat, and the time and cost of cleanup after an attack may increase significantly. DOE officials explained that surveys do have some limitations, noting that it is difficult to detect certain nuclear or well-shielded radiological materials. Weather conditions and the type of building being surveyed may also limit the ability to detect nuclear and radiological devices.

Nevertheless, in 2005, the New York City Police Department (NYPD) asked DOE to conduct a survey of the New York City metro area. The cost of the survey—about $800,000—was funded through DHS grants. NYPD officials indicated that the survey was tremendously valuable because it identified more than 80 locations with radiological sources that required further investigation to determine their risk. In addition to identifying potential terrorist threats, NYPD officials told us that a secondary benefit of the survey was identifying threats to public health. While investigating the 80 locations, they found an old industrial site contaminated with radium—a radiological material linked to diseases such as bone cancer—and used this information to close the area and protect the public. Despite these benefits, neither DOE nor DHS have embraced mission responsibility for funding and conducting surveys or notifying city officials that such a capability exists. DOE officials told us they are reluctant to conduct additional surveys because they have a limited number of helicopters that are needed

for emergency response functions, and told us that it is DHS's mission to protect cities from potential terrorist attacks. DHS officials disagreed with DOE, stating they do not have the expertise or capability to conduct surveys. However, DHS does have a program to help state and local governments detect illicit nuclear and radiological materials, and in fiscal year 2006, approximately $2.5 billion was available in grant funding to state and local governments for terrorism preparedness. In the absence of clear mission responsibility, there are no plans to conduct additional surveys, in part, because DOE and DHS are not informing cities about the benefits of these surveys.

We provided a draft of this report to DOE and DHS for comment. DHS agreed with our recommendations and provided technical comments, which we incorporated, as appropriate. DOE neither agreed nor disagreed with the report's recommendations, but raised concerns about one of our findings. In its written comments, DOE disagreed with our finding that physical security at the Remote Sensing Laboratories may not be sufficient to protect them against terrorist attacks. While we recognize that DOE is complying with physical security requirements, the Remote Sensing Laboratories are protected at the lowest level of physical security, even though the laboratories have unique capabilities and assets that exist at no other location and cannot be easily and quickly reconstituted. DOE also provided technical comments, which we incorporated, as appropriate.

Background

DOE's predecessor, the Atomic Energy Commission (AEC), established a program to prevent and respond to nuclear or radiological emergencies in 1974 after an extortionist threatened to detonate a nuclear device in Boston unless he received $200,000.[2] Even though the threat turned out to be a hoax, AEC recognized that it lacked the capability to quickly respond to a nuclear or radiological incident. To address this deficiency, AEC established the Nuclear Emergency Search Team (NEST) to provide technical assistance to the Federal Bureau of Investigation (FBI) and the Department of State, which is the lead federal agency for terrorism response outside the United States. Under the Atomic Energy Act, the FBI is responsible for investigating illegal activities involving the use of nuclear materials within the United States, including terrorist threats. The NEST program was designed to assist the FBI in searching, identifying, and

[2]DOE was established in 1977.

deactivating nuclear and radiological devices. However, the deployments of search teams were large scale and often slow because they were designed to respond to threats, such as extortion, when there was time to find the device.

With the threat of nuclear terrorism and the events of September 11, 2001, DOE's capabilities have evolved to more rapidly respond to nuclear and radiological threats. While NEST activities to prevent terrorists from detonating a nuclear or radiological device remain the core mission, DOE's emergency response activities have expanded to include actions to minimize the consequences of a nuclear or radiological incident. For example, DOE maintains an aerial capability to detect, measure, and track radioactive material to determine contamination levels at the site of an emergency. DOE has used this capability to conduct background radiation surveys of most nuclear power plants in the country for the Environmental Protection Agency and the Nuclear Regulatory Commission. In the event of an accident at a nuclear power plant, a new radiation survey could be performed to help determine the location and amount of contamination.

There are currently about 950 scientists, engineers, and technicians from the national laboratories and the Remote Sensing Laboratories dedicated to preventing and responding to a nuclear or radiological threat. In fiscal year 2005, DOE had a budget of about $90 million for emergency response activities. Under the National Nuclear Security Administration (NNSA), the Office of Emergency Response manages DOE's efforts to prevent and respond to nuclear or radiological emergencies.

In the aftermath of September 11, 2001, there is heightened concern that terrorists may try to smuggle nuclear or radiological materials into the United States. These materials could be used to produce either an improvised nuclear device or a radiological dispersal device, known as a dirty bomb. An improvised nuclear device is a crude nuclear bomb made with highly enriched uranium or plutonium. Nonproliferation experts estimate that a successful improvised nuclear device could have yields in the 10 to 20 kiloton range (the equivalent to 10,000 to 20,000 tons of TNT). A 20-kiloton yield would be the equivalent of the yield of the bomb that destroyed Nagasaki and could devastate the heart of a medium-size U.S. city and result in thousands of casualties and radiation contamination over a wider area.

A dirty bomb combines conventional explosives, such as dynamite, with radioactive material,[3] using explosive force to disperse the radioactive material over a large area, such as multiple city blocks. The extent of contamination would depend on a number of factors, including the size of the explosive, the amount and type of radioactive material used, and weather conditions. While much less destructive than an improvised nuclear device, the dispersed radioactive material could cause radiation sickness for people nearby and produce serious economic costs and psychological and social disruption associated with the evacuation and subsequent cleanup of the contaminated areas. While no terrorists have detonated a dirty bomb in a city, Chechen separatists placed a canister containing cesium-137 in a Moscow park in the mid-1990s. Although the device was not detonated and no radioactive material was dispersed, the incident demonstrated that terrorists have the capability and willingness to use radiological materials as weapons of terror.

DOE Has Unique Capabilities and Assets to Prevent and Respond to a Nuclear or Radiological Attack in the United States

DOE has unique capabilities and assets to prevent and respond to a nuclear or radiological attack in the United States. These include specialized teams and equipment to search for, locate, and deactivate nuclear or radiological devices and to help manage the consequences of a nuclear or radiological attack. To prevent an attack, search teams use a variety of clandestine and discreet methods, including the use of radiation sensors carried in backpacks and mounted on vehicles and helicopters, to detect and locate radiological sources. In the event of a nuclear or radiological attack, DOE would, among other things, use radiation-monitoring equipment, including sensors mounted on aircraft and vehicles, to detect and measure radiation contamination levels and provide information to state and local officials on what areas need to be evacuated. Table 1 summarizes DOE's capabilities and assets to prevent and respond to a nuclear or radiological attack.

[3]Different types of radioactive material that could be used by terrorists for a dirty bomb include cesium-137, cobalt-60, plutonium-238, plutonium-239, and strontium-90.

Table 1: DOE Capabilities and Assets to Prevent and Respond to a Nuclear or Radiological Attack

		Purpose	
Capabilities	**Mission**	**Prevent a nuclear or radiological attack or detonation**	**Respond to and manage the consequences of an attack**
Search	Search for and identify nuclear or radiological devices with radiation detectors mounted in backpacks, vehicles, and helicopters	X	
Deactivation	Deactivate and dispose of nuclear or radiological devices by viewing the components of a bomb with specialized equipment, deactivating booby traps, and packaging the devices for safe transport	X	
Recovery of U.S. nuclear weapons	In the event of an accident involving a U.S. nuclear weapon, assess the damage, stabilize internal components, and package the weapon for safe transport	X	
Radiological Assistance Program	First responders to search for devices with radiation detectors mounted in backpacks and on vehicles or to measure contamination levels after an attack or accident with environmental sampling and specialized devices	X	X
Aerial detection	Planes and helicopters with radiation detection equipment and sophisticated onboard computers to search for devices, conduct background radiation surveys, or measure contamination after a nuclear or radiological incident	X	X
Computer modeling of radiation release	Prediction of the extent of contamination with advanced computer modeling of wind, topography, and atmospheric conditions		X
Consequence management	Monitor and assess contamination from a large-scale nuclear or radiological attack and set up an operations center to coordinate response activities in the field		X
Medical support	Quickly mobilize medical personnel to provide advice and assistance for treating injuries resulting from radiation exposure		X

Source: GAO analysis of DOE information.

DOE Has Specialized Teams That Use a Variety of Methods and Equipment to Prevent a Nuclear or Radiological Attack

To prevent a nuclear or radiological attack, DOE has specialized teams to search for and deactivate nuclear or radiological devices. These teams are manned by full-time professionals and are ready to deploy on either civilian or military aircraft from the Remote Sensing Laboratories within 4 hours of notification from the FBI. To detect and locate nuclear or radiological devices, the teams use a variety of clandestine and discreet methods, including the use of radiation detectors carried in backpacks that silently transmit information to the searcher's earphone and radiation detectors mounted in vehicles and helicopters.

While backpacks and other hand-held equipment can detect and identify devices with greater accuracy, vehicle and helicopter-mounted radiation detectors allow DOE to cover a greater area in a shorter amount of time—which is particularly important when the exact location of a device is unknown and the teams need to search a large area. Once deployed, the searchers can also send information they are collecting from radiation detectors via a secure Internet line to scientists and technicians at the national laboratories to help them identify nuclear or radiological material and determine whether the material poses a threat. If the search teams need additional support to cover a large area, they can train and equip local responders, such as law enforcement and firefighters, to conduct search missions. Up to 16 people can become proficient in basic search techniques in less than an hour.

Should a device be located, a team composed of nuclear weapons scientists, technicians, and engineers from the national laboratories as well as the FBI and military ordnance disposal experts would be deployed to deactivate the device and prepare it for safe transport away from populated areas to the Nevada Test Site.[4] This would involve, among other things, clearing booby traps and separating the high explosives from the nuclear material. It also would involve the use of specialized equipment, such as a portable X-ray machine, to peer under a bomb's outer shell and view the bomb's components, identify the device, and determine the best way of deactivating it. This team maintains a comprehensive computer database of nuclear and radiological weapon design information for identifying and properly deactivating devices. Once a device is ready to be safely

[4]The Nevada Test Site is approximately 1,375 square miles—larger than the state of Rhode Island. Since it is isolated and far from populated areas, DOE uses the site for, among other things, hazardous chemical spill testing, emergency response training, conventional weapons testing, and waste management and environmental studies.

transported, scientists in an underground tunnel at the Nevada Test Site would disassemble and dispose of the device. Under certain circumstances, the team may not be able to safely transport the device and it may be necessary to destroy the bomb in place and mitigate the potential spread of radioactive material by, among other things, constructing a nylon tent around the device and filling it with thick foam.

Since September 11, 2001, DOE has expanded its search capability beyond the Remote Sensing Laboratories to include teams at eight other emergency response sites, allowing for more rapid deployment across the country.[5] These Radiological Assistance Program (RAP) teams traditionally have assisted state and local governments with responding to facility or transportation accidents involving radioactive material that may cause contamination and affect public health. Since these teams have experience and expertise in responding to nuclear emergencies—and are located in different regions across the country—their mission was expanded to include searching for nuclear or radiological devices. The RAP teams can drive to most cities in their geographic area and do not have to rely on air transport. In addition, since the two Remote Sensing Laboratories are located on the East and West coasts, the RAP teams can provide faster response to cities located in the center of the country.

In fiscal year 2005, the specialized search teams from the Remote Sensing Laboratories and the RAP teams conducted about 30 search missions. Most of these missions involved assisting local and state officials in monitoring large public events, such as the Super Bowl and the State of the Union address, to provide assurance that no devices were hidden in the stands or inside the building before the event. A number of these missions also involved intelligence-driven searches to address potential radiological threats in U.S. cities. Despite the teams' expertise and specialized equipment, DOE officials cautioned that it may still be difficult to detect nuclear or radiological devices. Radiation detection equipment may not detect nuclear materials with relatively low levels of radioactivity or radiological materials that are well-shielded. In addition, without good intelligence on the location of the device, search teams may not have time to find the device.

[5]The Radiological Assistance Program (RAP) teams are located in nine different parts of the country, including one at the Remote Sensing Laboratory at Andrews and eight additional emergency response sites.

In addition to preventing a nuclear or radiological attack, DOE is also responsible for responding to an accident involving a U.S. nuclear weapon. A DOE team made up of scientists, engineers, technicians, health physicists, and safety professionals from the national laboratories and nuclear weapons production facilities are ready to respond within 4 hours of notification of an accident, such as the crash of a military airplane transporting a nuclear weapon. In such a scenario, the team would assess the damage, if any, to the weapon by using, among other things, radiography to examine the weapon's internal structure, and how best to recover it safely. Since nuclear weapons contain chemically reactive materials and radioactive elements, great care must be taken in gaining access to them. For damaged weapons, the team has special techniques to stabilize the internal components. After weapons are safe to move, they can be packaged and prepared for transport.

DOE Has a Critical Role to Play in Minimizing the Consequences of a Nuclear or Radiological Attack

DOE maintains capabilities to minimize the impact of a nuclear or radiological attack. An RAP team likely would be the first DOE team to respond to a nuclear or radiological emergency, whether resulting from a terrorist attack or an accident. The RAP teams, located in nine different parts of the country, would be responsible for assessing the situation and determining what additional resources would be necessary to manage the emergency. These teams are expected to arrive at the site of an emergency within 4 to 6 hours and conduct an initial radiological assessment of the area. RAP team members are trained to provide initial assistance to minimize immediate radiation risks to people, property, and the environment. In responding to an emergency, they would use radiation detectors and air-sampling equipment to measure contamination and help state and local officials reduce the spread of contamination.

Large-scale contamination from a dirty bomb or nuclear device would require the deployment of consequence management teams from the Remote Sensing Laboratory at Nellis Air Force Base. These teams are responsible for setting up an operations center near the site of the emergency to coordinate environmental monitoring and assessment activities, conduct monitoring and assessment activities with specialized equipment, and collect and analyze data from the field on the type, amount, and extent of radiological release. This information would be used by state and local governments to determine what areas should be evacuated and how to properly respond to the emergency and by other federal agencies involved in decontamination and other cleanup activities. These teams

would monitor the area where radioactivity was released until the area was fully evaluated and the effects known.

In addition to the RAP and consequence management teams, DOE would collect information on the extent of contamination, using not only planes and helicopters fitted with radiation detectors but also sophisticated computer models. DOE has a limited number of planes and helicopters at the Remote Sensing Laboratories that detect, measure, and track radioactive materials to determine contamination levels. The aircraft can provide real-time measurement of low levels of ground contamination. They can also provide detailed imagery analysis of an accident site. The planes are deployed first to determine the location and extent of ground contamination. The helicopters are then used to perform detailed surveys of any ground contamination.[6] This information is used to decide where to send ground monitoring teams. Based on information from the aircraft, scientists are able to develop maps of the ground hazards. In addition to their ability to track radiation from a dirty bomb or nuclear device, the aircraft have also been used to search for lost or stolen nuclear material and to locate medical isotopes left behind after natural disasters, as occurred in the aftermath of Hurricane Katrina, to ensure they do not endanger the public.

Emergency response teams can also use computer models developed by the Lawrence Livermore National Laboratory to predict the consequences of a radiological release by modeling the movement of hazardous plumes. Based on the time, location, type of accident, and weather conditions, the model can predict the extent to which the material can spread and estimate the amount of the release. As technicians receive information from field teams, they can update the model.

Lastly, DOE can mobilize medical personnel to treat injuries resulting from radiation exposure. Medical radiation experts are on call 24 hours a day and can provide medical and radiological advice to state and local governments or deploy directly to an accident site. These experts also track the treatment of radiation accident patients and conduct medical follow-ups.

[6]These helicopters are the same ones used by the search teams to find nuclear or radiological devices in urban areas.

DOE's Current Physical Security Measures May Not Be Sufficient to Protect Its Key Emergency Response Facilities

DOE's two Remote Sensing Laboratories are protected at the lowest level of physical security allowed by DOE guidance because, according to DOE, their emergency response capabilities and assets have been dispersed across the country and are not concentrated at the laboratories. However, we found a number of critical emergency response capabilities and assets that exist only at the Remote Sensing Laboratories and whose loss would significantly hamper DOE's ability to quickly respond to a nuclear or radiological threat. Because these capabilities and assets have not been fully dispersed, current physical security measures may not be sufficient for protecting the facilities against a terrorist attack.

DOE Is Protecting Its Key Emergency Response Facilities with the Lowest Level of Physical Security Measures Allowed under DOE Guidance Because Some Capabilities and Assets Have Been Dispersed

DOE is protecting its two Remote Sensing Laboratories at the lowest level of physical security allowed under DOE guidance. According to DOE officials, the lowest level of security is adequate because emergency response assets and capabilities have been dispersed across the country and are no longer concentrated at these facilities. DOE policy guidance for safeguarding and securing facilities issued in November 2005 required a review of facilities protected at the lowest level of physical security to determine whether they were "mission critical." Mission critical facilities have capabilities and assets that are not available at any other location and cannot be easily and quickly reconstituted. Under DOE guidance, facilities designated as mission critical must be protected at a higher level of physical security. For example, DOE Headquarters was designated as mission critical because the loss of decision makers during an emergency would impair the deployment and coordination of DOE resources. As a result, DOE strengthened the physical security measures around DOE Headquarters by, among other things, adding vehicle barriers around the facility.

In April 2006, the Office of Emergency Response reviewed the capabilities and assets at the Remote Sensing Laboratories and found that they were not mission critical because if either one or both laboratories were attacked and destroyed, DOE would be able to easily reconstitute their capabilities and assets to meet mission requirements. Since September 11, 2001, DOE has dispersed some of the assets and capabilities once found exclusively at the Remote Sensing Laboratories. Specifically, DOE has expanded its search mission to include the RAP teams that are located at eight sites across the country. These teams receive training and equipment similar to the search teams at the Remote Sensing Laboratories, such as radiation detectors mounted in backpacks and vehicles. They have also

participated in a number of search missions, including addressing potential threats at sporting events and national political conventions, or assisting customs officials with investigating cargo entering ports and border crossings.

DOE Has Not Fully Dispersed the Capabilities and Assets at These Facilities, and Their Loss Would Significantly Hamper DOE's Ability to Respond to Nuclear and Radiological Threats

Contrary to DOE's assessment that the Remote Sensing Laboratories' capabilities and assets have been fully dispersed to other parts of the country, we found that the laboratories housed a number of unique emergency response capabilities and assets whose loss would significantly undermine DOE's ability to respond to a nuclear or radiological threat. The critical capabilities and assets that exist only at the laboratories include (1) the teams that help minimize the consequences of a nuclear or radiological attack, (2) the planes and helicopters designed to measure contamination levels and assist search teams in locating nuclear or radiological devices, and (3) a sophisticated mapping system that tracks contamination and the location of radiological sources in U.S. cities. Furthermore, while the RAP teams have assumed a greater role in searching for nuclear or radiological devices, the teams at the Remote Sensing Laboratories remain the most highly trained and experienced search teams.

The consequence management teams that would respond within the first 24 hours of a nuclear or radiological attack are located at the Remote Sensing Lab at Nellis Air Force Base. These teams have specialized equipment for monitoring and assessing the type, amount, and extent of contamination. They are responsible for establishing an operations center near the site of contamination to coordinate all of DOE's radiological monitoring and assessment activities and to analyze information coming from the field, including aerial survey data provided by helicopters, planes, and ground teams monitoring radiation levels. Without this capability, state and local governments would not receive information quickly about the extent of contamination to assess the impact on public health and private property and how best to reduce further contamination.

DOE's emergency response planes and helicopters are designed to detect, measure, and track radioactive material at the site of a nuclear or radiological release to determine contamination levels. DOE has a limited number of planes and helicopters designed for this mission at the Remote Sensing Laboratories. These planes and helicopters use a sophisticated radiation detection system to gather radiological information and produce maps of radiation exposure and concentrations. It is anticipated that the planes would arrive at an emergency scene first and be used to determine

the location and extent of ground contamination. The helicopters would then be used to perform more detailed surveys of any contamination. According to DOE officials, the planes and helicopters can gather information on a wide area without placing ground teams at risk. Without this capability, DOE would not be able to quickly obtain comprehensive information about the extent of contamination. The helicopters can also be used by search teams to locate nuclear or radiological devices in U.S. cities. The helicopters can cover a larger area in a shorter amount of time than teams on foot or in vehicles. The ground search teams can conduct secondary inspections of locations with unusual radiation levels identified by the helicopter.

The Remote Sensing Laboratory at Nellis Air Force Base also maintains a sophisticated mapping system that can be used by consequence management teams to track contamination in U.S. cities after a nuclear or radiological attack. DOE collects information from its planes and helicopters, ground monitoring teams, and computer modeling and uses this system to provide detailed maps of the extent and level of contamination in a city. Without this system, DOE would not be able to quickly analyze the information collected by various emergency response capabilities and determine how to respond most effectively to a nuclear or radiological attack. This mapping system can also be used to help find nuclear or radiological devices more quickly before they are detonated.

DOE officials told us the loss of these capabilities and assets that are unique to the Remote Sensing Laboratories would devastate DOE's ability to respond to a nuclear or radiological attack. State and local governments would not receive information—such as the location and extent of contamination—that they need in a timely manner in order to manage the consequences of an attack and reduce the harm to public health and property. Despite the importance of these capabilities and assets, DOE has not developed contingency plans identifying capabilities and assets at other locations that could be used in the event that one or both Remote Sensing Laboratories were attacked. Specifically, DOE has not identified which RAP team would assume responsibility for coordinating contamination monitoring and assessment activities in the place of the consequence management teams from Nellis. During an emergency, the lack of clearly defined roles may hamper emergency response efforts.

DOE officials told us that in the event that the capabilities and assets of both Remote Sensing Laboratories were destroyed, they could mobilize and deploy personnel and equipment from the RAP teams or national

laboratories. The RAP teams and some national laboratories, such as Sandia, have similar equipment that could be used to measure contamination in a limited area. However, if both Remote Sensing Laboratories were destroyed, the RAP teams and the national laboratories would not have planes and helicopters to conduct large-scale contamination monitoring and assessment. The RAP teams also do not have the equipment or expertise to set up an operations center and analyze data that field teams would collect on contamination levels. In April 2006, DOE's Office of Independent Oversight, which is responsible for independently evaluating, among other things, the effectiveness of DOE's programs, reported that the RAP teams, during performance tests, could not quickly provide state and local governments with recommendations on what actions to take to avoid or reduce the public's exposure to radiation and whether to evacuate contaminated areas.[7] In addition, DOE officials told us that, based on training exercises, the demands of responding to two simultaneous nuclear or radiological events strained all of DOE's capabilities to manage the consequences. According to DOE officials, if the consequence management teams at Nellis could not respond and there were multiple, simultaneous attacks, DOE's capabilities to minimize the impact of a nuclear or radiological attack would be significantly hampered.

DOE officials also told us that if Nellis Air Force Base were attacked, their aerial contamination measuring assets would not be lost unless the aircraft at Andrews Air Force Base were also destroyed. However, DOE policy generally requires that some of its aerial assets stationed at Andrews remain in the Washington, D.C., area to protect top government decision makers and other key government assets. During a nuclear or radiological emergency, DOE would need to rely on a limited airborne capability to measure contamination levels. In addition, if there were multiple simultaneous events, there would be considerable delay in providing information to state and local governments about the extent of contamination because DOE could assist only one city at a time.

Some DOE officials suggested that if DOE helicopters were not available to provide assistance, DOE could request another helicopter and fit it with radiation detectors. However, during an emergency, we found that DOE would face a number of challenges in equipping a helicopter not designed

[7]Department of Energy, Office of Security and Safety Performance Assurance, *Independent Oversight Inspection of the Radiological Assistance Program* (Washington, D.C., April 2006).

for measuring contamination. DOE officials told us that DOE has a memorandum of understanding with the Department of Defense and other federal and state agencies to use their helicopters and planes for transport and other mission requirements, but that it is unlikely that DOD or any other agency would provide them with aircraft during an emergency because those agencies' priority would be to carry out their own missions, not to assist DOE. Even if DOE were provided with helicopters, DOE does not have spare radiation detectors like those found on its own helicopters, and even if it did have spares, it would not have time to mount radiation detectors on the exterior of the aircraft. DOE officials told us that radiation detectors, like those found on their vehicles, could be placed inside an airplane or helicopter, but the ability to measure contamination would be significantly reduced compared with an exterior-mounted detector.

Furthermore, DOE does not conduct training exercises to simulate the actions necessary to reconstitute the capabilities and assets unique to the Remote Sensing Laboratories, such as placing radiation detectors on helicopters or testing the ability of RAP teams to conduct large-scale contamination monitoring and assessment without the assistance of the consequence management teams from Nellis. DOE officials told us that all of their training scenarios and exercises involve the use of consequence management teams and the planes and helicopters from the Remote Sensing Laboratories. As a result, DOE does not know whether it would be able to accomplish mission objectives without the capabilities and assets of the Remote Sensing Laboratories.

Lastly, while the RAP teams have assumed a greater role in searching for nuclear or radiological devices, Remote Sensing Laboratories have the most highly trained and experienced search teams. For example, the search teams at the Remote Sensing Laboratories are the only teams trained to conduct physically demanding maritime searches to locate potential nuclear or radiological devices at sea before they arrive at a U.S. port. The search teams can also repair radiation equipment for search missions in the field. Furthermore, these search teams are more prepared than the RAP teams to enter environments where there is a threat of hazards other than those associated with radiological materials, such as explosives. If there is a threat of explosives in an area where a search mission would be conducted, these teams have specialized equipment to detect explosives and can more quickly request FBI ordnance disposal assistance in order to complete their search mission. In April 2006, the Office of Independent Oversight reported that the RAP teams did not always complete their search missions when there was a high level of risk to the lives of the RAP

team members from explosives. The report found that some RAP teams refused to perform the mission unless all risk from explosives around a device was removed and others completed the mission only after certain safety criteria were met. According to this study, leaders of the RAP teams had to make on-the-spot judgments weighing the safety of RAP team members against their ability to complete the search mission because there was a lack of guidance on how to respond.

Current Physical Security Measures May Not Be Sufficient to Protect the Facilities against Terrorist Attack

Under DOE guidance, the physical security measures for facilities in the lowest level of security may include barriers such as fences, walls, and doors.[8] According to DOE officials, a facility can have, at a minimum, walls and doors and be in compliance with the guidance. Adding additional measures, such as fences and vehicle barriers, are under the discretion of the security officer in charge of the facilities. According to DOE security officials, the Remote Sensing Laboratory at Nellis Air Force Base exceeds current physical security requirements because DOE placed a fence around the facility and a vehicle barrier at the front entrance. These additional measures were taken because, at the time the Remote Sensing Laboratory was built, these measures were required.

In contrast, the Remote Sensing Laboratory at Andrews Air Force Base does not have a fence or any vehicle barriers because it is located along the executive route used by the President and foreign dignitaries when they land at Andrews and exit the base. The buildings along this route must meet specific aesthetic standards, which prohibit the use of certain physical security measures, such as fences. Despite these limitations, DOE security officials told us that the laboratory still meets the minimum security requirements. According to these officials, the Office of Emergency Response, which is responsible for managing DOE's emergency response capabilities, would have to classify the facilities as mission critical before more stringent measures would be required.

While current physical security measures are consistent with DOE guidance and may protect the facilities against trespass and theft of classified government documents, these measures may not be sufficient to protect the facilities against a terrorist attack. Security officials told us that current physical security measures at the Remote Sensing Laboratories

[8]DOE Order 470.4-2, Physical Protection (Aug. 26, 2005).

have not been hardened or designed to withstand certain types of terrorist attacks. Security officials told us that the physical security measures protecting these facilities have not been strengthened because, if there were credible intelligence that the facilities faced the risk of terrorist attack, DOE could take additional measures to protect the facility, such as deploying protective forces around the laboratories and limiting access to the parking areas near the facilities. However, security officials would have to rely on good intelligence to prevent such an attack. In addition, under DOE guidance, facilities that house nuclear weapons or substantial quantities of special nuclear material that could be used in nuclear weapons are required to have vehicle barriers and other protective measures. Since the Remote Sensing Laboratories do not have nuclear weapons or special nuclear material, additional security measures are not required unless the facilities are classified as mission critical.

While the laboratories' location on Air Force bases may appear to provide an additional level of security, access onto Nellis and Andrews Air Force Bases is not strictly limited, and any person with a federal government identification may gain entry. In addition, Air Force guards do not inspect every vehicle. Vehicles are randomly inspected, and Air Force security guards can use their judgment as to whether a car should be searched. In fact, GAO staff gained access to the bases multiple times with little or no scrutiny of their identification, and their vehicles were never searched.

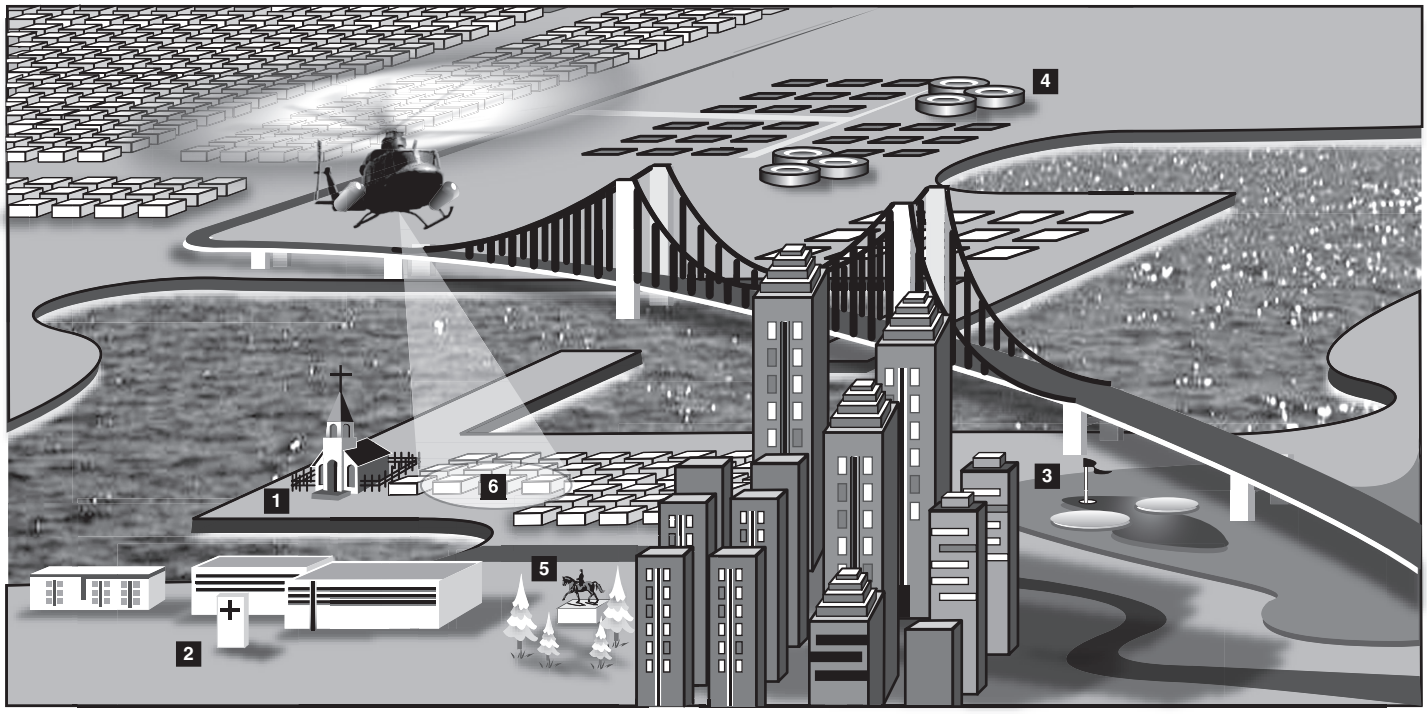
Despite the Benefits of Conducting Aerial Background Radiation Surveys, They Remain Underutilized Because Neither DOE Nor DHS Has Mission Responsibility for Funding and Conducting Them

There are significant benefits to conducting aerial background radiation surveys of U.S. cities. Once surveys are complete, they can later be used to compare changes in radiation levels to (1) help detect radiological threats in U.S. cities more quickly and (2) measure radiation levels after a radiological attack to assist in and reduce the costs of cleanup efforts. Despite the benefits, there has been a survey of only one major U.S. city. Since neither DOE nor DHS has mission responsibility for funding and conducting surveys, there are no plans to conduct additional surveys or to inform cities about their benefits.

Completing Baseline Aerial Surveys Can Later Help to Detect Radiological Threats in U.S. Cities and Measure Radiation Levels in the Event of a Radiological Attack

DOE can conduct aerial background radiation surveys to record the location of radiation sources and produce maps showing existing radiation levels within U.S. cities. Background radiation can come from a variety of sources, such as rock quarries; granite found in buildings, statues, or cemeteries; medical isotopes used at hospitals; and areas treated with high amounts of fertilizer, such as golf courses. DOE uses helicopters mounted with external radiation detectors and equipped with a global position system to fly over an area and gather data in a systematic grid pattern. Figure 1 illustrates a helicopter conducting an aerial survey and collecting information on radiation sources in a city.

Figure 1: Illustration of a Helicopter Conducting an Aerial Background Radiation Survey



Source: GAO.

Onboard computers record radiation levels and the position of the helicopter. This initial, or baseline, survey allows DOE technicians and scientists to produce maps of a city showing the locations of high radiation concentrations, also known as "hot spots." DOE uses helicopters rather than airplanes because their lower altitude and lower speed permits a more precise reading. While conducting the baseline survey, DOE ground teams and law enforcement officials can investigate these hot spots to determine whether the source of radiation is used for industrial, medical, or other routine purposes. DOE officials told us that this baseline information

would be beneficial for all major cities because law enforcement officials could immediately investigate any potentially dangerous nuclear or radiological source and DOE could later use the data in the event of an emergency to find a device more quickly or assist in cleanup efforts. For example, in 2002, DOE conducted a survey of the National Mall in Washington, D.C., just prior to July Fourth celebrations. Law enforcement officials used the survey to investigate unusual radiation sources and ensure the Mall area was safe for the public.

Data from the baseline survey would help DOE and law enforcement detect new radiological threats more quickly. In the event of a dirty-bomb threat, DOE could conduct a new, or follow-up, survey and compare that radiation data to the baseline survey data to identify locations with new sources of radiation. Law enforcement officials looking for a nuclear or radiological device would focus their attention on these new locations and might be able to distinguish between pre-existing sources and potential threats in order to locate a dirty bomb or nuclear device more quickly. Conducting baseline surveys also provides a training opportunity for DOE personnel. DOE officials told us that regular deployments helped to keep job performance standards high for pilots, field detection specialists, and the technicians who analyze the data.

DOE can also use a baseline radiation survey to assess changes in radiation levels after a radiological attack to assist with cleanup efforts. A follow-up survey could be taken afterward to compare changes against the baseline radiation levels. This information can be used to determine which areas need to be cleaned and to what levels. In 2004, DOD funded a survey of the area around the Pentagon in Northern Virginia in order to assist with cleanup efforts in case of nuclear or radiological attack. While no study has reliably determined the cleanup costs of a dirty-bomb explosion in an urban area, DOE estimates that cleaning up after the detonation of a small to medium-size radiological device may cost tens or even hundreds of millions of dollars. DOE officials estimated that information from background radiation surveys could save several million dollars in cleanup costs because cleanup efforts could be focused on decontaminating buildings and other areas to pre-existing levels of radiation. Without a baseline radiation survey, cleanup crews would not know the extent to which they would have to decontaminate the area. Efforts to completely clean areas with levels of pre-existing radiation, such as granite buildings or hospitals, would be wasteful and expensive.

DOE officials cautioned that background radiation surveys have limitations and cannot be relied upon to detect all nuclear or radiological devices. Aerial surveys may not be able to detect certain nuclear or well-shielded radiological materials. Weather conditions and the type of building being surveyed may also reduce the effectiveness of detection systems. Furthermore, DOE may have to rely on good intelligence to find a device. Law enforcement officials would need intelligence information to narrow the search to a specific part of a city. Lastly, according to DOE officials, baseline background radiation surveys may need to be conducted on a periodic basis because radiation sources may change over time, especially in urban areas. For example, new construction using granite, the installation of medical equipment, or the heavy use of fertilizer all could change a city's radiation background. Despite these limitations, without baseline survey information, law enforcement officials may lose valuable time when searching for nuclear or radiological threats by investigating pre-existing sources of radiation that are not harmful. In addition, if there were a nuclear or radiological attack, a lack of baseline radiological data would likely make the cleanup more costly and time consuming.

DOE Has Conducted a Survey of Only One Major City

In 2005, the New York City Police Department (NYPD) asked DOE to conduct a survey of the New York City metro area. NYPD officials were aware that DOE had the capability to measure background radiation and locate hot spots by helicopter because DOE used this capability at the World Trade Center site in the days following September 11, 2001. DHS provided the city with about $30 million in grant money to develop a regional radiological detection and monitoring system. NYPD decided to spend part of this money on a complete aerial survey of all five boroughs. DOE conducted the survey in about 4 weeks in the summer of 2005, requiring over 100 flight hours to complete at a cost of about $800,000.

According to NYPD officials, the aerial background radiation survey exceeded their expectations, and they cited a number of significant benefits that may help them better respond to a radiological incident. First, NYPD officials said that in the course of conducting the survey, they identified over 80 locations with unexplained radiological sources. Teams of NYPD officers accompanied by DOE scientists and technicians investigated each of these hot spots and determined whether they posed a danger to the public. While most of these were medical isotopes located at medical facilities and hospitals, according to NYPD officials, awareness of these locations will allow them to distinguish false alarms from real radiological threats and locate a radiological device more quickly. Second,

NYPD officers are now trained in investigating hot spots and they have real-life experience in locating radiological sources. Third, NYPD officials now have a baseline radiological survey of the city to assist with cleanup efforts in the event of a radiological release.

In addition to identifying potential terrorist threats, a secondary benefit of the survey was identifying threats to public health. One of the over 80 locations with a radiological signature was a local park that was once the site of an industrial plant. According to NYPD officials, the survey disclosed that the soil there was contaminated by large quantities of radium.[9] Brush fires in the area posed an imminent threat to public health because traditional fire mitigation tactics of pushing flammable debris into the middle of the park could release radiological contamination into the air. Investigating locations with unexplained radiological sources identified by the aerial background radiation survey alerted NYPD officials to this threat, and they were able to prevent public exposure to the material.

Because the extent to which the background radiation of a city changes over time is not clear, NYPD officials have requested that DHS provide money to fund a survey every year. With periodic surveys, NYPD hope to get a better understanding of how and to what extent background radiation changes over time. NYPD officials also want to continue identifying radiological sources in the city and to provide relevant training to their officers.

Despite the Benefits, Neither DOE Nor DHS Has Mission Responsibility for Aerial Background Radiation Surveys, Which Has Discouraged Both Agencies from Informing Cities about the Surveys

Despite the benefits of aerial background radiation surveys, neither DOE nor DHS has embraced mission responsibility for funding and conducting surveys. In addition, neither agency is notifying city officials of the potential benefits of aerial surveys or that such a capability exists. According to DOE and DHS officials, New York City is the only city where a background radiation survey has been completed.

DOE officials told us that DOE is reluctant to conduct large numbers of additional surveys because they have a limited number of helicopters that are needed to prevent and respond to nuclear and radiological emergencies. Furthermore, they assert that DOE does not have sufficient funding to conduct aerial background radiation surveys. In fiscal year 2006,

[9]According to the Environmental Protection Agency, long-term exposure to radium increases the risk of developing diseases such as lymphoma, bone cancer, and leukemia.

the emergency response budget for aerial radiation detection was approximately $11 million to cover costs for items such as aircraft maintenance, personnel, fuel, and detection equipment. DOE relies on federal agencies and cities to reimburse them for the costs of surveys. However, even if DHS funded cities to pay for surveys, as it did in New York's case, DOE officials stated that payment would need to include costs associated with the wear and tear on the helicopters. Furthermore, the extra costs could not be completely recovered by increasing the charges to the city because, according to DOE officials, DOE cannot accumulate money from year to year to pay for future lump-sum repairs. In addition, DOE officials view background radiation surveys as part of the homeland security mission to prepare state and local officials against terrorist attacks, not as part of their emergency response mission. However, DOE officials told us that because they possess the assets and expertise, they would be willing to conduct additional surveys if DHS funded the full cost of the surveys and covered the wear and tear on DOE's equipment.

DHS officials told us that it is not DHS's responsibility to conduct aerial background radiation surveys or to develop such a capability. DHS's Domestic Nuclear Detection Office (DNDO) told us it does not have the expertise or capability to conduct surveys and that surveys are DOE's responsibility. However, DNDO is responsible for assisting state and local governments' efforts to detect and identify illicit nuclear and radiological materials and to develop mobile detection systems. DNDO has not evaluated the benefits and limitations of background surveys and does not plan to conduct background surveys as part of this effort. DHS officials also told us that it is DHS's responsibility to advise cities about different radiation detection technology and to help state and local officials decide which technologies would be most beneficial. However, DNDO does not currently advise cities and states on the potential benefits of background surveys.

DHS also has a grant program to improve the capacity of state and local governments to prevent and respond to terrorist and catastrophic events, including nuclear and radiological attacks. In fiscal year 2006, there was about $2.5 billion available in grant funding for state and local governments. DHS officials told us that this grant funding could be used for radiation surveys if cities requested them. However, according to DHS officials, the agency has not received any requests for funding other than the 2005 request by New York City. While it is DHS's responsibility to inform state and local governments about radiation detection technology, it has neither an outreach effort nor does it maintain a central database for

informing cities and states about background radiation surveys. DHS maintains a lessons-learned information-sharing database, which is a national online network of best practices and lessons learned to help plan and prepare for a terrorist attack. However, it is the responsibility of state and local governments to enter information into this database, and DHS officials told us they were not aware if New York City officials had added any information to the database about the surveys. According to DHS officials, it is DOE's responsibility to inform cities and states about the surveys, since DOE maintains the capability for conducting them.

In the absence of clear mission responsibility, there are no plans to conduct additional surveys, and no other city has requested one, in part, because DOE and DHS are not informing cities about the benefits of these surveys.

Conclusions

Preventing a nuclear or radiological explosion that could kill or injure many people and severely disrupt the nation's economy depends, in part, on DOE's ability to search for and deactivate a device with little or no warning. Reducing the loss of life from radiation exposure and the spread of contamination in the event of a nuclear or radiological explosion also depends, in part, on DOE's capability to determine what parts of a U.S. city have been contaminated and provide this information to local and state governments to help evacuate citizens that are at risk of exposure and to administer medical aid. A number of critical capabilities and assets for preventing and responding to nuclear and radiological attacks reside at DOE's two Remote Sensing Laboratories. Despite efforts to disperse emergency response capabilities and assets to other regions, the Remote Sensing Laboratories still play a prominent role in DOE's ability to search for and locate nuclear or radiological devices and to minimize the consequences of a nuclear or radiological attack. The capabilities and assets that are unique to the laboratories include consequence management teams that provide information to state and local governments about the extent of contamination; the planes and helicopters used to locate lost or stolen nuclear or radiological materials and measure contamination levels; and a sophisticated mapping system that contains information on the locations of radiological sources in U.S. cities. In addition, the Remote Sensing Laboratories house specialized teams that are highly trained in clandestine search techniques and can conduct physically demanding search missions, such as maritime boarding. Despite the importance of the assets and capabilities located at these facilities, the Remote Sensing Laboratories are protected at DOE's lowest level of physical security. If DOE's emergency response capabilities were fully

dispersed, then providing only minimal security may be sufficient. However, since several DOE emergency response capabilities remain unique to the Remote Sensing Laboratories, we believe that the physical security measures around those facilities may not be sufficient to protect their capabilities. We recognize that physical protection measures may be costly and that DOE security officials must prioritize where to spend limited resources in a fiscally constrained environment. However, in our view, a modest improvement in security at the Remote Sensing Laboratories, such as installing vehicle barriers, would significantly enhance the protection of highly valuable assets against a terrorist attack.

In responding to a nuclear or radiological emergency, DOE must rely on all of the capabilities and assets at its disposal. One capability that remains underutilized is aerial background radiation surveys. These surveys establish baseline radiological data that can later be used to more quickly detect radiological threats in U.S. cities and to measure changes in contamination levels after a radiological attack in order to better focus and reduce cleanup costs. Despite their benefits and relatively low cost, there has been a survey of only one major metropolitan area. Since neither DOE nor DHS has embraced mission responsibility for performing the surveys, they have not evaluated the costs, benefits, and limitations of conducting the surveys for metropolitan areas that may be most at risk from a terrorist attack. While DOE has the expertise to conduct the surveys, the department is reluctant to encourage cities to request the surveys because it has a limited number of helicopters at its disposal, and they are generally reserved for emergency response missions. DHS, which is responsible for assisting state and local governments in preparing for a nuclear or radiological attack and has a $2.5 billion grant program to improve state and local governments' capacity to do so, has not considered aerial surveys to be part of its efforts to protect cities against such an attack. With no agency assuming responsibility for informing cities about the benefits of these surveys, U.S. cities are missing an opportunity to be better prepared for a terrorist attack.

Recommendations for Executive Action

To better ensure that all capabilities and assets are available and used to prevent or minimize the consequence of a nuclear or radiological attack, we are making the following three recommendations:

- The Administrator of NNSA, who implements the emergency response program within DOE, should review the physical security measures at the Remote Sensing Laboratories and determine whether additional

measures should be taken to protect the facilities against a loss of critical emergency response capabilities or whether it is more cost-effective to fully disperse its capabilities and assets to multiple areas of the country.

- The Administrator of NNSA and the Secretary of Homeland Security should evaluate the costs, benefits, and limitations of conducting aerial background radiation surveys of metropolitan areas, especially those that are considered to be most at risk of a terrorist attack; determine whether they would help prevent and respond to a nuclear or radiological attack; and report the results to the Congress.

- If the Administrator of NNSA and the Secretary of Homeland Security determine that the surveys would help prevent and respond to a nuclear or radiological attack, the Secretaries should work together to develop a strategy for making greater use of the aerial surveys. In developing this strategy, the Secretary of Homeland Security should consider (1) the costs and benefits of funding these surveys through its existing grant program for state and local governments or through other means and (2) ways to inform state and local government officials about the benefits and limitations of aerial background radiation surveys so that these government officials can make their own decision about whether they would benefit from the surveys.

Agency Comments and Our Evaluation

We provided DOE and DHS with draft copies of this report for their review and comment. DHS agreed with our recommendations. DOE neither agreed nor disagreed with our recommendations, but raised concerns about one of our findings. In its written comments, DOE disagreed with our finding that the physical security of the Remote Sensing Laboratories may not be sufficient to protect them against terrorist attacks. According to DOE, physical security measures at these two facilities are sufficient because (1) two senior-level managers diligently reviewed the physical security measures around the facilities and believe that they are sufficient and (2) the laboratories are located on Air Force bases. We disagree with these rationales and stand behind our finding. First, while we acknowledge that current physical security measures for the two Remote Sensing Laboratories are consistent with DOE guidance, the laboratories are protected at the lowest level of physical security. This means that a facility can meet the requirements by having walls and doors but no other physical security measures. For example, the Remote Sensing Laboratory at Andrews Air Force Base does not have a fence or any vehicle barriers, but

security officials told us that it still meets the minimum security requirements. Further, DOE's justification for protecting the laboratories at the lowest level of physical security is that their emergency response capabilities and assets have been dispersed across the country and are not concentrated at the laboratories. However, although we found that DOE had dispersed some of its emergency response capabilities and assets, a number of critical emergency response capabilities and assets still exist only at the laboratories. Because these capabilities and assets have not been fully dispersed, current physical security measures may not be sufficient for protecting the facilities against a terrorist attack.

Second, the security officials responsible for developing security plans for the laboratories told us that they do not rely on Air Force personnel to protect the facility against a terrorist attack. As we reported, while the laboratories' location on Air Force bases may appear to provide an additional level of security, access onto Nellis and Andrews Air Force Bases is not strictly limited, and any person with a federal government identification may gain entry. Furthermore, guards at these installations do not inspect every vehicle. In fact, as discussed in our report, GAO staff gained access to the bases multiple times with little or no scrutiny of their identification, and their vehicles were never searched.

In its written comments, DOE agreed that there may be value in performing additional aerial background radiation surveys. However, DOE was concerned that existing mission requirements may limit DOE's ability to conduct aerial surveys. While we recognize that DOE has limited resources to conduct aerial surveys, we note that the agency does have the expertise and that there is funding potentially available under DHS's grant program for state and local governments. If neither DOE nor DHS assume mission responsibility for conducting the aerial surveys and do not inform cities about the benefits of these surveys, U.S. cities will miss an important opportunity to be better prepared for a terrorist attack.

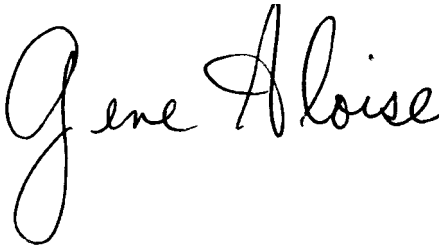
DOE also noted that aerial background radiation surveys have limitations. For example, aerial surveys may not be able to detect well-shielded radiological materials. We acknowledged these limitations in our report. However, despite the limitations, without baseline survey information from an aerial survey, law enforcement officials may lose valuable time when searching for nuclear or radiological threats by investigating pre-existing sources of radiation that are not harmful. In addition, if there were a nuclear or radiological attack, the lack of baseline radiological data would likely make the cleanup more costly and time consuming.

DHS provided comments via e-mail. Comments from DOE's NNSA are reprinted in appendix I. DOE and DHS also provided technical comments, which we incorporated, as appropriate.

We are sending copies of this report to the Secretary of Energy, the Administrator of NNSA, the Secretary of Homeland Security, and interested congressional committees. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or aloisee@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix II.

Sincerely yours,



Gene Aloise
Director, Natural Resources
and Environment

Comments from the Department of Energy

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

August 31, 2006

Mr. Gene Aloise
Director,
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Aloise:

The National Nuclear Security Administration (NNSA) appreciates the opportunity to review the Government Accountability Office's (GAO) draft report, "COMBATING NUCLEAR TERRORISM: Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Emergency Response Capabilities Could be Strengthened." We understand that this work was done at the request of the House's Chairman, Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform to determine our capabilities to prevent potential nuclear attacks, the physical security measures at two of our facilities, and the benefits of conducting background radiation surveys.

While NNSA appreciates the work performed by GAO, we categorically reject the contention that physical security at two of our facilities may not be sufficient for protecting against terrorist attacks. The reason for this rejection is twofold. (1) The physical security posture for the two facilities (and everything related to that posture) was reviewed and approved by two senior level managers–the Associate Administrator for Emergency Operations, the overseer of one of only two mission operational elements within NNSA, and the Chief, Defense Nuclear Security/Associate Administrator for Defense Nuclear Security. Both of these senior managers and their respective staffs performed all due diligence related to the current security posture of the facilities in question and believe that both have sufficient physical security. (2) The facilities are tenant organizations aboard major military installations that have significant security arrangements of their own.

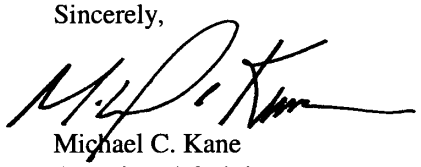
Regarding the discussion related to background surveys, NNSA agrees that there may be value in performing background surveys. However, the tempo of our operational requirements may preclude us from developing an effective schedule of such services. Additionally, with or without a background survey, the probability of finding a low activity radiological source or highly shielded source

from the air is very low. Equally, with or without a background survey, the probability of finding a high activity source from the air is high.

We appreciate GAO's acknowledgment that NNSA has a unique capability. We recognize that capability and take special care to manage and protect our assets judiciously.

NNSA recommends to GAO that since NNSA is a separately organized agency, albeit within the Department of Energy, the report and corresponding recommendations be directed to the Administrator, National Nuclear Security Administration. Should you have any questions related to this response, please contact Richard Speidel, Director, Policy and Internal Controls Management.

Sincerely,



Michael C. Kane
Associate Administrator
for Management and Administration

cc: Tom D'Agostino, Deputy Administrator for Defense Programs
Joe Krol, Associate Administrator for Emergency Response
William Desmond, Associate Administrator for Defense Nuclear Security
Karen Boardman, Director, Service Center

GAO Contact and Staff Acknowledgments

GAO Contact

Gene Aloise, (202) 512-3841 or aloisee@gao.gov

Staff Acknowledgments

In addition to the contact named above, Leland Cogliani, John Delicath, Mattias Fenton, Glen Levis, Greg Marchand, Keith Rhodes, Rebecca Shea, and Ned Woodward made significant contributions to this report.

GAO's Mission

The Government Accountability Office, the audit, evaluation and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "Subscribe to Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are $2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, D.C. 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm
E-mail: fraudnet@gao.gov
Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Gloria Jarmon, Managing Director, JarmonG@gao.gov (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, D.C. 20548

Public Affairs

Paul Anderson, Managing Director, AndersonP1@gao.gov (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, D.C. 20548