



Testimony

Before the Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate

---

For Release on Delivery  
Expected at 10:00 a.m. EST  
Thursday, November 15, 2007

# COMBATING NUCLEAR TERRORISM

## Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Key Emergency Response Facilities Could Be Strengthened

Statement of Gene Aloise, Director  
Natural Resources and Environment



GAO  
Accountability · Integrity · Reliability

# Highlights

Highlights of [GAO-08-285T](#), a testimony before the Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate

## Why GAO Did This Study

The Department of Energy (DOE) maintains emergency response capabilities and assets to quickly respond to potential nuclear and radiological threats in the United States. 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. These capabilities took on increased significance after the attacks of September 11, 2001, because of heightened concern that terrorists may try to detonate a nuclear or radiological device in a major U.S. city. DOE is not the only federal agency responsible for addressing nuclear and radiological threats. The Department of Homeland Security (DHS) is responsible for preparing the country to prevent and respond to a potential nuclear or radiological attack.

This testimony discusses (1) the benefits of using DOE's aerial background radiation surveys to enhance emergency response capabilities and (2) the physical security measures in place at DOE's two key emergency response facilities and whether they are consistent with DOE guidance. It is based on GAO's report on DOE's nuclear and radiological emergency response capabilities, issued in September 2006 (*Combating Nuclear Terrorism: Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Emergency Response Capabilities Could be Strengthened* [Washington, D.C.: Sept. 21, 2006]).

To view the full product, including the scope and methodology, click on [GAO-08-285T](#). For more information, contact Gene Aloise at (202) 512-3841 or [aloise@gao.gov](mailto:aloise@gao.gov).

## COMBATING NUCLEAR TERRORISM

### Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Key Emergency Response Facilities Could Be Strengthened

#### What GAO Found

DOE has unique capabilities and assets to prevent and respond to a nuclear or radiological attack in the United States. One of these unique capabilities is the ability to conduct aerial background radiation surveys. These 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. DOE and DHS disagree about which department is responsible for informing cities about the surveys, and funding and conducting surveys if cities request them. In the absence of clear mission responsibility, DOE and DHS have not informed cities about the surveys and have not conducted any additional surveys.

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.

DOE Helicopter Conducting an Aerial Background Radiation Survey



Source: DOE.

---

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss the Department of Energy's (DOE) use of aerial background radiation surveys, and physical security measures at DOE's two key emergency response facilities. DOE has long maintained an emergency response capability to quickly respond to potential nuclear and radiological threats in the United States. This capability took on increased significance after the attacks of September 11, 2001, because of 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. One of DOE's unique capabilities is the ability to conduct aerial background radiation surveys. Helicopters or planes equipped with radiation detectors 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 exercise 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.

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.<sup>1</sup>

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. DHS also provides grants to state and local governments to help them better prepare and respond to a potential terrorist attack. DHS has provided \$11.6 billion in grants to state and local governments in the last 6 fiscal years—from fiscal years 2002 to 2007. 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.

For this testimony, you asked us to discuss (1) the benefits of using DOE's two key emergency response facilities and whether they are consistent with DOE guidance and (2) the physical security measures in place at DOE's two key emergency response facilities and whether they are consistent with DOE guidance. My remarks will focus on our September 2006 report on DOE's nuclear and radiological emergency response efforts.<sup>2</sup> To update this information, we also collected documentation and interviewed officials from DOE's Office of Emergency Response, DHS's Domestic Nuclear Detection Office, DOE's Remote Sensing Laboratory at Nellis Air Force Base, and the Counter Terrorism Bureau of the New York City Police Department. We conducted our work in November 2007 in accordance with generally accepted government auditing standards.

---

<sup>1</sup>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.

<sup>2</sup>GAO, *Combating Nuclear Terrorism: Federal Efforts to Respond to Nuclear and Radiological Threats and to Protect Emergency Response Capabilities Could be Strengthened*, [GAO-06-1015](#) (Washington, D.C.: Sept. 21, 2006).

---

## Summary

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 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 has 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, and these are needed for emergency response functions, and because 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 2007, made available approximately \$1.7 billion in grant funding to state and local governments for terrorism preparedness. In the absence of clear mission responsibility, DOE and DHS have not conducted additional surveys, in part, because DOE and DHS are not informing cities about the benefits of these surveys.

DOE's two Remote Sensing Laboratories, which house a number of unique emergency response capabilities and assets, 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 are available 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. These capabilities and assets include the most highly trained teams to 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.

---

## 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.<sup>3</sup> 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 for, identifying, and 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.

---

<sup>3</sup>DOE was established in 1977.

---

Currently, about 950 scientists, engineers, and technicians from the national laboratories and the Remote Sensing Laboratories are dedicated to preventing and responding to a nuclear or radiological threat. In fiscal year 2006, DOE had a budget of about \$100 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,<sup>4</sup> 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 terrorism.

---

<sup>4</sup>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.



---

**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**

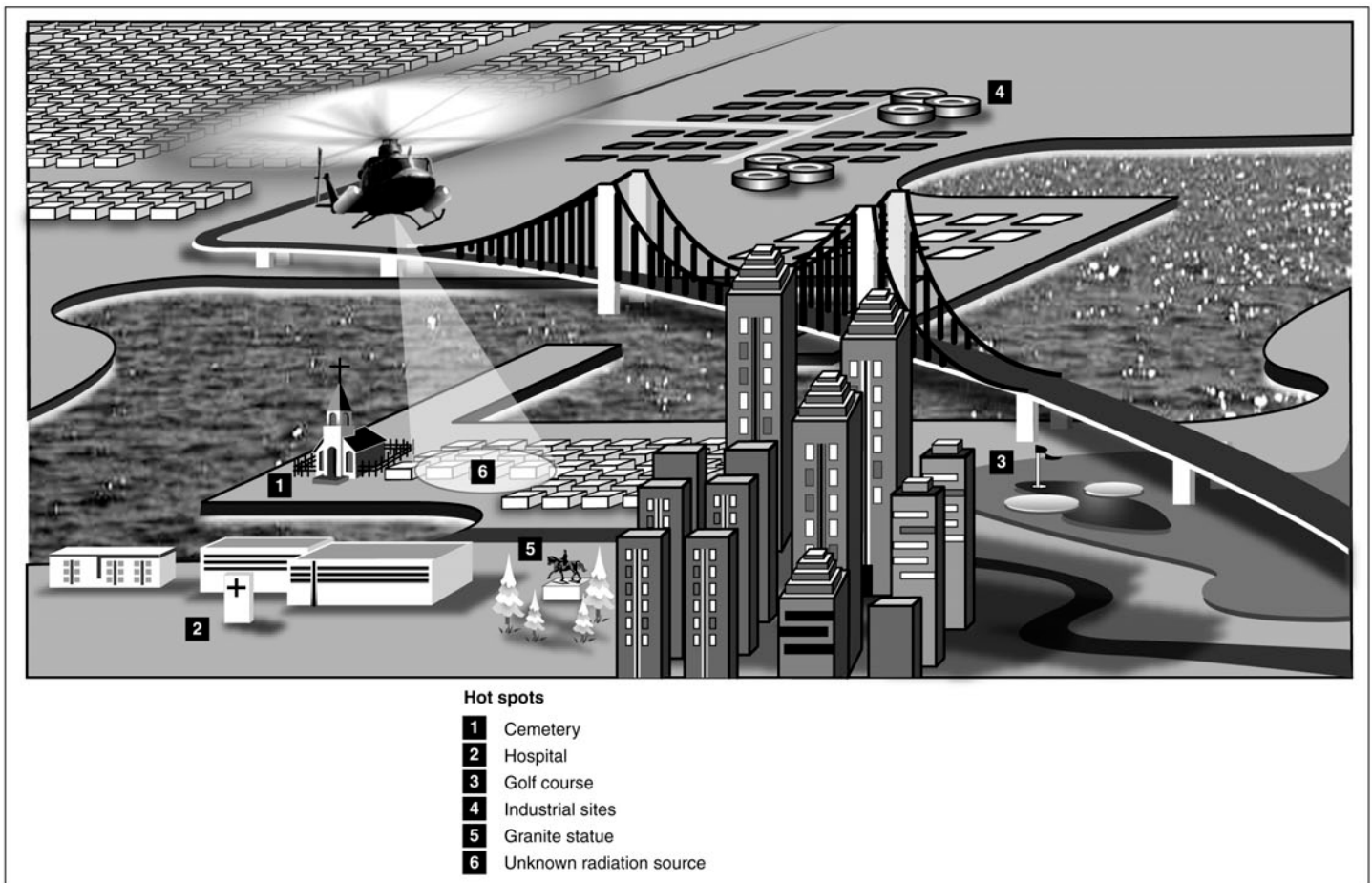
There are significant benefits to conducting aerial background radiation surveys of U.S. cities. Once surveys are complete, they can later be used to compare changes in radiation levels to (1) help detect radiological threats in U.S. cities more quickly and (2) measure radiation levels after a radiological attack to assist in and reduce the costs of cleanup efforts. Despite the benefits, only one major U.S. city has been surveyed. Since neither DOE nor DHS has mission responsibility for funding and conducting surveys, they have not conducted additional surveys nor informed 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 permit 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 periodically 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 survey 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 had 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 hot spots 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.<sup>5</sup> 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 hopes 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 Developing a Strategy to Inform 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. While DOE and DHS have taken some steps toward making greater use of aerial surveys, they still have not developed a strategy to notify city officials that such a capability exists, explained the benefits and limitations of aerial surveys, and determined how to pay for the surveys. According to DOE and DHS officials, New York City is the only city where a background radiation survey has been completed.

As we reported in September 2006, we found that neither DOE nor DHS was notifying city officials of the potential benefits of aerial surveys or of the availability of such a capability. In addition, neither department had evaluated the costs, benefits, or limitations of the aerial surveys to help cities decide whether to request a survey. As a result, we recommended that DOE and DHS conduct such an evaluation. After completing this evaluation, we then recommended that DOE and DHS develop a strategy

---

<sup>5</sup>According to the Environmental Protection Agency, long-term exposure to radium increases the risk of developing diseases such as lymphoma, bone cancer, and leukemia.

---

to notify state and local government officials about the benefits and limitations of the surveys so government officials could decide whether they would benefit from the surveys. According to DOE officials, in April 2007, DOE began meeting with DHS to conduct the evaluation and the departments are drafting a document that would describe the benefits and limitations. They plan to distribute this document to state and local governments to inform them about the surveys. However, the departments have no specific timeframe for completing this document. In addition, DOE and DHS notified one city—Chicago—about the benefits of the surveys since we issued our report. DOE and DHS are working with the Chicago Police Department to install radiation detection equipment on planes or helicopters owned by the Chicago Police Department to conduct aerial background radiation surveys. DOE officials told us that this approach may be less costly and state and local governments may be able respond more quickly to an emergency by using their own aircraft. If this approach is successful, DOE officials told us they would recommend that other cities also purchase and install radiation detection equipment on their own aircraft. However, DOE officials did not provide a timeframe for completing this project.

DOE officials told us that the department is reluctant to conduct large numbers of additional surveys if cities request them because they have a limited number of helicopters, and these 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, the emergency response budget for aerial radiation detection was approximately \$11 million for costs 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 DOE's 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. According to DNDO, it does not have the expertise or capability to conduct surveys, which are DOE's responsibility. However, DNDO is responsible for assisting state and local governments' efforts to detect and identify illicit nuclear and radiological materials, develop mobile detection systems, and advise cities about different radiation detection technology to help state and local officials decide which technologies would be most beneficial. DNDO does not plan to conduct background surveys as part of this effort, but it plans to work with DOE to 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 2007, about \$1.7 billion was 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. Instead, 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. State and local governments can enter information into this database, and DHS officials told us they were not aware if New York City officials had done so.

More than a year after we issued our report, the status on background radiation surveys remains largely unchanged. In short, in the absence of clear mission responsibility, neither DOE nor DHS has any plans to conduct additional surveys. In addition, no other city has requested one, in part, because DOE and DHS have informed only one city—Chicago—about the benefits of these surveys.

---

## 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 are available 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 Its 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's November 2005 policy guidance for safeguarding and securing facilities 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 determined 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 Radiological Assistance Program (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 The Two 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) teams that help minimize the consequences of a nuclear or radiological attack, (2) 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 Laboratory at Nellis Air Force Base. These teams have specialized equipment for monitoring and assessing the type, amount, and extent of contamination. These teams 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.

At these two laboratories, the teams also have specialized equipment—emergency response planes and helicopters—that 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. The 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, in a shorter amount of time, without placing

---

ground teams at risk. Without this capability, DOE could not 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 helicopters.

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 during performance tests, the RAP teams 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.<sup>6</sup> In addition, DOE officials told us, 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 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

---

<sup>6</sup>Department of Energy, Office of Security and Safety Performance Assurance, *Independent Oversight Inspection of the Radiological Assistance Program* (Washington, D.C., April 2006).

---

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, it 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 Office also reported 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.

Because of these concerns, we recommended in September 2006 that DOE 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 was more cost-effective to fully disperse its capabilities and assets to multiple areas of the country. Since we issued our report, DOE has not made any upgrades or other changes to security at the Remote Sensing Laboratories. In written comments responding to our recommendations, DOE concluded that it was not cost-effective to further disperse emergency response capabilities. In addition, DOE noted that it would not be making any changes to the security of the Remote Sensing Laboratories because the security measures were reviewed separately by the Associate Administrator for Emergency Response and the Associate Administrator for Defense Nuclear Security and they agreed that security measures were adequate. While DOE may have reviewed the physical security measures at the Remote Sensing Laboratories, it did not specifically address the security issues we raised. We continue to believe that these measures may not be sufficient to protect unique and critical emergency response capabilities at these facilities.

Mr. Chairman, this concludes my prepared statement. I would be pleased to respond to any questions you or other Members of the Subcommittee may have at this time.

---

## Contacts and Staff Acknowledgments

For future contacts regarding this testimony, please contact Gene Aloise at (202) 512-3841. Leland Cogliani, Omari Norman, Carol Herrnstadt Shulman, and Ned Woodward made key contributions to this testimony.

---

---

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.

---

## 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](http://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](http://www.gao.gov) and select "E-mail 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, DC 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](http://www.gao.gov/fraudnet/fraudnet.htm)

E-mail: [fraudnet@gao.gov](mailto:fraudnet@gao.gov)

Automated answering system: (800) 424-5454 or (202) 512-7470

---

## Congressional Relations

Gloria Jarmon, Managing Director, [jarmong@gao.gov](mailto:jarmong@gao.gov), (202) 512-4400  
U.S. Government Accountability Office, 441 G Street NW, Room 7125  
Washington, DC 20548

---

## Public Affairs

Chuck Young, Managing Director, [youngc1@gao.gov](mailto:youngc1@gao.gov), (202) 512-4800  
U.S. Government Accountability Office, 441 G Street NW, Room 7149  
Washington, DC 20548