U.S. Department of Energy
Office of Inspector General
Office of Audit Services

Audit Report

Nuclear Detection Devices

DOE/IG-0720

February 2006

Department of Energy
Washington, DC 20585

February 28, 2006

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Audit Report on "Nuclear Detection Devices"

INTRODUCTION AND OBJECTIVE

The detection of nuclear materials and devices and the development of related countermeasures are topics of great importance to the security of the United States, especially in the post September 11, 2001, environment. Historically, the Department of Energy (Department) sponsored and managed most of the Nation's research associated with nuclear detection and countermeasures. The bulk of this work was carried out by the Department's national laboratories. However, the Homeland Security Act of 2002 transferred aspects of the Department's nuclear materials detection research and development to the Department of Homeland Security. More broadly, the Act authorized Homeland Security access to the capabilities of the national laboratories on an equal basis with other missions at the site.

Under the 2002 Act, the Department retained responsibility for research and development in areas of remote sensing and other technologies that analyze the global spread of nuclear weapons and technology, as well as, space- and ground-based sensors that defense and intelligence agencies use to verify and monitor arms control treaties. Additionally, under National Security Presidential Directive-43/Homeland Security Presidential Directive-14, the Secretary of Energy is designated to take a leading role in nonproliferation research and development. Further, where appropriate, he is to make dual use counter-proliferation and counter-terrorism nuclear detection research and development available to Homeland Security and other entities.

The objective of this review was to evaluate the Department's efforts to coordinate radiation detection research and development activities conducted by the national laboratories. The review was initiated based on the importance of this subject to national security and on congressional concern about the implications of possible duplication of effort.

CONCLUSIONS AND OBSERVATIONS

We identified over $100 million spent on radiation detection research in Fiscal Year (FY) 2004 by the Department and Homeland Security at six national laboratories examined during our audit. Yet, the Department had not established formal mechanisms to coordinate such research. Although some ad hoc coordination had occurred, the Department had not developed procedures that detailed how research being conducted by the national laboratories for

Homeland Security should be coordinated with parallel or similar research sponsored by the Department. For example, Headquarters, site office and laboratory personnel we contacted were knowledgeable about Department of Energy-sponsored research activities being conducted at the various laboratories. However, the Department had not developed procedures for nor required reporting Homeland Security-funded research to Headquarters or any other central entity. As a result, neither the Department nor Homeland Security, which is responsible for integrating nuclear and radiological detection capabilities across Federal agencies, had a complete inventory of relevant research being conducted at the national laboratories. In our judgment, such an inventory, if properly used, is an essential tool for planning and budgeting resources, in order to:

- avoid unnecessary research duplication;
- direct scarce research dollars to the most promising technologies; and,
- allocate research funding to the laboratory having appropriate expertise in the technology under study.

Nuclear Detection Activities

To determine the scope of nuclear detection activities at the Department's national laboratories, we requested an inventory from both Departmental and Homeland Security officials; however, neither could provide complete information. Officials within the Department commented that, although they were knowledgeable about the Department's activities, there was no central repository where comprehensive nuclear detection information was maintained. Homeland Security officials also advised us that they did not have a complete inventory of nuclear and radiological detection research and development at the Department of Energy's laboratories. As a result we had to obtain the necessary information on a "piece meal" basis from numerous headquarters and laboratories officials. Thus, there is no assurance that the data we collected is complete and comprehensive.

The audit results clearly confirmed, however, that the six national laboratories included in our review were conducting large amounts of radiation detection research and development for both the Department and Homeland Security. The following table shows how the $100 million spent by the Department and Homeland Security was distributed among the six laboratories during FY 2004.

Radiation Detection R&D at DOE Laboratories
Fiscal Year 2004
(in millions)

Laboratory	DOE-Funded	DHS-Funded	Total
Brookhaven	$ 1.4	$ 2.1	$ 3.5
Los Alamos	17.7	0	17.7
Oak Ridge	15.0	2.7	17.7
Sandia	1.7	5.3	7.0
Lawrence Livermore	2.4	11.7	14.1
Pacific Northwest	5.8	38.8	44.6
Total	$44.0	$60.6	$104.6

As shown in the table, in FY 2004, the Pacific Northwest National Laboratory was responsible for the largest amount of nuclear detection work. Although we limited our review to the six national laboratories, there were other Departmental entities involved in the process. For example, nuclear detection work was in process at the Nevada Test Site.

Centralized Inventory

The establishment and maintenance of a centralized inventory of radiation detection research at the national laboratories is needed by the Department to support ongoing coordination efforts by Homeland Security. Both the Department and Homeland Security officials agreed that a centralized inventory would assist in the integration of nuclear radiological detection capabilities across Federal agencies and help develop a national nuclear detection system. In furtherance of this goal, we provided Department officials with the inventory of radiation detection projects at the national laboratories compiled during the audit.

Both Department and Homeland Security officials advised that the Domestic Nuclear Detection Office (DNDO), established in April 2005 at the direction of the President would, among other things, coordinate radiation detection research efforts with the Department and other agencies. Specifically, the role of the DNDO is to establish a global nuclear detection architecture. The Department is responsible for supporting the Office's coordination efforts and, according to senior officials, planned to provide at least eleven Departmental personnel to help staff the Office on a full time basis. We believe that providing resources to the DNDO is a positive, initial step towards achieving necessary program coordination and integration between the two agencies.

Coordination

During the course of this audit, we met with the Department's senior liaison to the DNDO to determine if there are mechanisms to facilitate coordination between the two organizations. The representative advised that there has been frequent interaction with DNDO, however, the coordination process is evolving and that as the need arises, policy and procedures will be implemented. The representative acknowledged that there are a number of issues that need to be resolved between the Department and DNDO. For example, there have been some conflicts regarding research and development priorities at the Department's laboratories. There is currently no established policy on the matter and conflicts have been resolved on a case by case basis. The representative also advised that he is amenable to suggestions to improve coordination with the DNDO and Homeland Security as a whole.

Although substantial funds have already been spent in the pursuit of new and improved nuclear detection devices, significant future funding is anticipated, making it especially important to promptly address the issues raised in this report. Specifically, it became clear during our audit that without improved coordination, the United States may not fully realize the full benefit of the research and development resources it has dedicated to nuclear detection mechanisms.

RECOMMENDATION

We recommend that the Department establish formal procedures to coordinate radiation detection research being conducted by the national laboratories, regardless of funding source.

This should include, among other things, the establishment of a central inventory of such research projects, and policy and procedures for resolving programmatic conflicts between DNDO and the Department.

MANAGEMENT REACTION

On December 14, 2005, we discussed our conclusions, observations, and recommendations with the Deputy Under Secretary for Counterterrorism who agreed to pursue implementation of our recommendation with the DNDO.

Attachment

cc: Deputy Secretary
Under Secretary for Energy, Science and Environment
Deputy Under Secretary for Counterterrorism, NNSA
Chief of Staff
Director, Policy and Internal Controls Management, NA-66

SCOPE AND METHODOLOGY

The audit was performed between March 2005 and February 2006 at the Department of Energy in Washington, DC; Sandia National Laboratories in Albuquerque, NM; Los Alamos National Laboratory in Los Alamos, NM; and the Pacific Northwest National Laboratory in Richland, Washington. We requested nuclear detection information from three additional laboratories: Lawrence Livermore National Laboratory, Oak Ridge National Laboratory, and Brookhaven National Laboratory.

To accomplish the audit objective, we:

- Reviewed policies and procedures governing nuclear detection activities;
- Interviewed Departmental Headquarters officials concerning nuclear detection devices;
- Interviewed Department of Energy and contractor officials at Sandia National Laboratories, Los Alamos National Laboratory, and Pacific Northwest National Laboratory;
- Analyzed nuclear detection information from the five nuclear weapons laboratories, Brookhaven, and Headquarters; and,
- Reviewed performance measures established in accordance with Government Performance and Results Act.

The audit was conducted in accordance with generally accepted Government auditing standards for performance audits and included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not rely extensively on computer processed data.

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