



U.S. Department of Energy
Office of Inspector General
Office of Inspections and Special Inquiries

Inspection Report

Removal of Categories I and II Special
Nuclear Material from Sandia National
Laboratories-New Mexico



Department of Energy
Washington, DC 20585

January 15, 2010

MEMORANDUM FOR THE SECRETARY

Greg Friedman
FROM: Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Inspection Report on “Removal of Categories I and II Special Nuclear Material from Sandia National Laboratories-New Mexico”

BACKGROUND

The Department of Energy's (DOE's) Sandia National Laboratories-New Mexico (Sandia) develops science-based technologies in support of national security in areas such as nuclear weapons, nonproliferation, military technologies, and homeland security. Sandia's primary mission is ensuring that the U.S. nuclear arsenal is safe, secure, and reliable and can fully support the Nation's deterrence policy. Part of this mission includes systems engineering of nuclear weapons; research, design, and development of non-nuclear components; manufacturing of non-nuclear weapons components; the provision of safety, security, and reliability assessments of stockpile weapons; and the conduct of high-explosives research and development and environmental testing. Sandia Corporation, a subsidiary of Lockheed Martin Corporation, operates Sandia for the National Nuclear Security Administration (NNSA).

On May 7, 2004, the Secretary announced that the Department would evaluate missions at DOE sites to consolidate Special Nuclear Material (SNM) in the most secure environments possible. The Administrator of the NNSA said that this effort was a key part of an overall plan to transform the nuclear weapons complex into a smaller, safer, more secure, and more efficient national security enterprise. In February 2008, Sandia was the first site to report it had reduced its on-site inventory of nuclear material below "Categories I and II" levels, which require the highest level of security to protect material such as plutonium and highly enriched uranium.

The Office of Inspector General initiated an inspection to determine if Sandia made appropriate adjustments to its security posture in response to the removal of the Categories I and II SNM.

RESULTS OF INSPECTION

We found that Sandia adjusted its security posture in response to the removal of Categories I and II SNM. For example, security posts were closed; unneeded protective

force weapons and equipment were excised from the site; and, Sandia's Site Safeguards and Security Plan was modified.

We also found that some highly enriched uranium in a complex material configuration was not removed from Sandia. This material was designated as Category III material using a methodology for assessing the attractiveness of complex materials that was not specifically addressed in any current DOE directive. Although DOE and NNSA officials believed that this designation was appropriate, the methodology used to support this designation had not, as of the time of our review, been incorporated into the DOE directives system. Historically, the Department has considered the categorization of SNM to be an important national security and public policy issue. Consequently, we believe that expedited action should be taken to formalize this methodology in the DOE directives system and that it be disseminated throughout the Department of Energy complex.

MANAGEMENT REACTION

In comments to a draft of this report, the Office of Health, Safety, and Security (HSS) concurred with the report recommendation and identified corrective actions that have been and will be taken to address the recommendation.

We consider HSS' comments generally responsive to our report recommendation. However, HSS raised certain issues regarding the distinction between the publication of a "guide" and the promulgation of "policy." While we recognize the point that HSS was making and understand the need to consider the practical impact of these kinds of distinctions, we believe the position that we have taken is appropriate. This matter is discussed more fully in the attached report.

In comments to a draft of this report, NNSA generally agreed with the report and recommendation. We consider NNSA's comments generally responsive to our report recommendation.

Management's comments are provided in their entirety in Appendix B of the report.

Attachment

cc: Deputy Secretary
Administrator, National Nuclear Security Administration
Chief Health, Safety and Security Officer, Office of Health, Safety and Security Office
Chief of Staff
Manager, Sandia Site Office
Director, Office of Internal Review (CF-1.2)

REMOVAL OF CATEGORIES I AND II SPECIAL NUCLEAR MATERIAL FROM SANDIA NATIONAL LABORATORIES-NEW MEXICO

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Overview

INTRODUCTION AND OBJECTIVES

The Department of Energy's (DOE's) Sandia National Laboratories-New Mexico (Sandia) develops science-based technologies in support of national security in areas such as nuclear weapons, nonproliferation, military technologies, and homeland security. Sandia's primary mission is ensuring that the U.S. nuclear arsenal is safe, secure, and reliable and can fully support the Nation's deterrence policy. Part of this mission includes systems engineering of nuclear weapons; research, design, and development of non-nuclear components; manufacturing of non-nuclear weapons components; the provision of safety, security, and reliability assessments of stockpile weapons; and the conduct of high-explosives research and development and environmental testing. Sandia Corporation, a subsidiary of Lockheed Martin Corporation, operates Sandia for the National Nuclear Security Administration (NNSA).

On May 7, 2004, the Secretary announced that the Department would evaluate missions at DOE sites to consolidate Special Nuclear Material (SNM) in the most secure environments possible. The Administrator of the NNSA said that this effort was a key part of an overall plan to transform the nuclear weapons complex into a smaller, safer, more secure, and more efficient national security enterprise. In February 2008, Sandia was the first site to report it had reduced its on-site inventory of nuclear material below "Categories I and II" levels, which require the highest level of security to protect material such as plutonium and highly enriched uranium.

The Office of Inspector General initiated an inspection to determine if Sandia made appropriate adjustments to its security posture in response to the removal of the Categories I and II SNM.

SUMMARY

We found that Sandia adjusted its security posture in response to the removal of Categories I and II SNM. For example, security posts were closed; unneeded protective force weapons and equipment were excised from the site; and, Sandia's Site Safeguards and Security Plan was modified.

We also found that some highly enriched uranium in a complex material configuration was not removed from Sandia. This material was designated as Category III material using a methodology for assessing the attractiveness of complex materials

that was not specifically addressed in any current DOE directive. Although DOE and NNSA officials believed that this designation was appropriate, the methodology used to support this designation had not, as of the time of our review, been incorporated into the DOE directives system. Historically, the Department has considered the categorization of SNM to be an important national security and public policy issue. Consequently, we believe that expedited action should be taken to formalize this methodology in the DOE directives system and that it be disseminated throughout the Department of Energy complex.

Details of Findings

BACKGROUND

DOE follows a graded safeguards program for nuclear material. Under this concept, a safeguards program must provide the greatest relative amount of control and accountability for the types and quantities of SNM that can be most effectively used in a nuclear explosive device. SNM is designated by "Attractiveness Levels" and "Categories." The Attractiveness Levels, which are designated A through E, address the chemical and physical form of the material (weapons, pure products, high-grade material, low-grade material, and all other material). The Categories, which are designated I through IV, are based on the Attractiveness Level and the amount and type of nuclear material (i.e., Pu, U-233, U-235, Np-237, and Am-241/243).

Since 1994, the DOE policy applicable to the designation of SNM for safeguards purposes has been promulgated through DOE orders, manuals, and guides. For the purposes of determining SNM Attractiveness Levels and Categories, DOE's current policy is found under DOE Order 470.4A, "Safeguards and Security Program," and the associated Manual, DOE M 470.4-6, Change 1, dated August 26, 2005. Under this Manual, the "Graded Safeguards" table provides specific information on the chemical and physical form of SNM, as well as the amount and type of SNM, for use in determining SNM Attractiveness Levels and Categories. This Manual cancelled a DOE guide which had addressed the use of another methodology, "weight percent criteria," for determining SNM Attractiveness Levels and Categories. The "weight percent criteria," when it was part of the DOE directives system, had allowed DOE to consider the percent by weight of SNM in addition to the chemical/physical form and the amount/type of SNM found in the "Graded Safeguards" table. However, current DOE directives do not specifically address this methodology for use in determining SNM Attractiveness Levels and Categories.

CATEGORIZATION OF SNM

We found that Sandia adjusted its security posture in response to the removal of Categories I and II SNM. For example, security posts were closed; unneeded protective force weapons and equipment were excessed from the site; and, Sandia's Site Safeguards and Security Plan was modified.

We also found that some highly enriched uranium in a complex material configuration was not removed from Sandia. This material was designated as Category III material using a

methodology for assessing the attractiveness of complex materials that was not specifically addressed in any current DOE directive.

Annular Core Research Reactor Fuel

Sandia maintains an Annular Core Research Reactor (ACRR). The reactor fuel is uranium, enriched to 35 percent U-235 with 21.5 weight-percent UO₂ and 78.5 weight-percent BeO. In a May 16, 2006, e-mail to Office of the Associate Administrator for Defense Nuclear Security (NA-70), the Sandia Site Office (Site Office) stated that there was confusion with regard to the Attractiveness Level for the nuclear material in the ACRR. The Site Office stated that the current order/manual did not make any reference to "weight percent criteria" in determining Attractiveness Levels and the current manual could not stand on its own as a source for determining Attractiveness Levels. The Site Office requested policy clarification and guidance that could be used to direct Sandia in determining the Attractiveness Levels for the ACRR.

In an e-mail dated May 17, 2006, an official from NA-70 told the Site Office that they could use the "weight percent criteria" in determining Attractiveness Levels. This official stated that "This is not a new issue - as soon as they deleted all references to the Guide to take care of the 20-50% isotopic enrichment issue in the Safeguards Table (which conflicted with the Guide), they essentially threw out the baby with the bath water as the entire Guide then became defunct." This official stated that the Office of Health, Safety and Security (HS-70) was working on policy revisions, but policy revisions would take significant time.

In a June 16, 2006, Site Office memorandum, the Site Office acknowledged that the August 26, 2005, publication of DOE M 470.4-6 removed all references to the Guide which contained the "weight percent criteria." The Site Office stated that, "Most recently, this resulted in the categorization of the Annular Core Research Reactor (ACRR) as a Category IC SNM target." This categorization was based on the "Graded Safeguards" table in DOE M 470.4-6, Change 1, and a March 23, 2005, NA-70 policy memorandum stating that uranium metal and oxides enriched to greater than 20 percent in the U-235 isotope should be considered material of Attractiveness Level B and C, respectively. The Site Office memorandum went on to state that NA-70 had since determined that the ACRR material was Attractiveness Level "D" versus "C," resulting in the ACRR being designated as a Category IIID target.

**Policy Revisions
Needed**

The designation of the ACRR fuel as a Category IIID target was based on the use of the “weight percent criteria.” However, DOE O 251.1C, Departmental Directives Program, Section 4d(6), Unofficial Guidance, states that “Existing requirements that cross organizational lines and apply to contractors but were not developed and promulgated through the formal directives process are to be considered invalid unless/until they have been reviewed and adopted through that process.”

The Deputy Director, Office of Security Policy, Office of Health, Safety and Security (HS-70), told us that the guide containing the “weight percent criteria” was cancelled because certain aspects of the guide were no longer consistent with Departmental policy. However, this official said that the cancellation of the guide was unrelated to the use of weight percent in determining material attractiveness. This official stated that the use of weight percent remained a common and acceptable technical technique in the Material Control and Accountability community that would soon become an even more important technique if proposed revisions to the use of the Graded Safeguards Table were published. Further, this official stated that a working group was formed in 2008 to revise the manual based on current security considerations and that the revised policy was expected to make even greater use of weight percent.

In comments to a draft of this report, the Chief Health, Safety and Security Officer confirmed that the “weight percent criteria” is an authorized methodology for determining the category and attractiveness level of SNM. However, as of the date of our review and despite the passage of considerable time, the use of the “weight percent criteria” methodology still had not been formalized in the DOE directives system, which is the mechanism by which Departmental policy/requirements are captured and disseminated. Consequently, we believe that expedited action should be taken to formalize this methodology in the DOE directives system so that the designation of the ACRR fuel as Category IIID is on a firm, recognizable policy foundation, consistent with U. S. national nuclear requirements.

RECOMMENDATION

We recommend that the Chief Health, Safety and Security Officer, Office of Health, Safety and Security, ensures that action is taken to formalize the use of the “weight percent criteria” in the DOE directives system and that revised guidance be disseminated throughout the Department of Energy complex.

**MANAGEMENT
COMMENTS**

In comments on a draft of this report, the Office of Health, Safety, and Security (HSS) concurred with the report recommendation. Management identified corrective actions that have been and will be taken to address our recommendation.

In comments on a draft of this report, NNSA generally agreed with the report and recommendation.

Management's comments are included in their entirety at Appendix B.

**INSPECTOR
COMMENTS**

We consider HSS comments generally responsive to our report recommendation. However, HSS stated that the report seemed to view publication of a guide as establishing requirements, noting that a guide is explicitly not policy. We would like to note that published manuals "supplement other directives, laws, regulations, or other requirements by providing more instructions or details on how the provisions of those directives or laws must be carried out throughout DOE." The Guide associated with the previous Manual had provided preferred, non-mandatory supplemental information about the acceptable methods to meet requirements. When the Manual cancelled the Guide, the acceptable methods which included "weight percent criteria" were also cancelled.

We consider NNSA's comments generally responsive to our report recommendation.

Appendix A

SCOPE AND METHODOLOGY

We conducted the majority of the fieldwork for this inspection between February and March 2009. Our review included interviews with Sandia Site Office officials, NNSA and DOE Headquarters representatives, and Sandia National Laboratory personnel. We reviewed and evaluated DOE and NNSA policies, the Site Safeguards and Security Plan, and related security documentation. We also toured Sandia's Technical Area V.

Pursuant to the "Government Performance and Results Act of 1993," we reviewed Sandia's performance measurement processes as they relate to the removal of SNM from Sandia.

This inspection was conducted in accordance with the "Quality Standards for Inspections" issued by the President's Council on Integrity and Efficiency, currently known as the Council of the Inspectors General on Integrity and Efficiency (CIGIE).

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Department of Energy
Washington, DC 20585

September 24, 2009

MEMORANDUM FOR GREGORY H. FRIEDMAN
INSPECTOR GENERAL
OFFICE OF INSPECTOR GENERAL

FROM: GLENN S. PODONSKY
CHIEF HEALTH, SAFETY AND SECURITY OFFICER
OFFICE OF HEALTH, SAFETY AND SECURITY

SUBJECT: COMMENTS FOR IG DRAFT REPORT: Removal of
Categories I and II Special Nuclear Material from Sandia
National Laboratory – New Mexico (S09IS007)

The Office of Health, Safety and Security (HSS) has reviewed the subject draft report provided by the Inspector General's memorandum on September 4, 2009, and provides the following comments.

As requested in your memorandum of September 4, 2009, the Office of Health, Safety and Security (HSS) has reviewed the subject draft inspection report. Your summary of information received from the Office of Security Policy, within HSS, is factually correct. The Office of Security Policy is, as reported, pursuing a policy change that will include additional guidance on the use of the "weight percent criteria" discussed in your report to properly categorize special nuclear materials (SNM) in certain configurations, including the reactor fuel for the Annular Core Research Reactor (ACRR) at Sandia National Laboratories – New Mexico (SNL-NM).

Your report seems to view publication of a guide as establishing requirements. On the contrary, a guide is explicitly not policy, as noted in DOE Order 251.1, Departmental Directives Program and in guidance from the Secretary's Directives Review Board. According to these sources, guides "provide preferred, non-mandatory supplemental information about acceptable methods to meet requirements" and "do not impose requirements."

With regard to your specific recommendations, the first is to reconfirm any decision as to whether the "weight percent criteria" methodology is authorized for determining the category and attractiveness level of SNM. It is and has been an authorized method. Further, we have in draft a revision to DOE Manual 470.4-6, Nuclear Material Control and Accountability, that will explicitly authorize this method and a draft technical standard that will provide detail about the methodology. Due to the ongoing Security Reform Initiative directed by the Deputy Secretary, it is not possible to provide a projected publication date for these documents at this time.



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Appendix B

Your second recommendation is to ensure that the ACRR fuel is categorized consistent with policy and that such policy determination be formalized in the directives system and disseminated throughout the DOE complex. We believe, after consultation with the National Nuclear Security Administration (NNSA), that the categorization of the ACRR fuel is correct. This categorization has been reviewed and confirmed by subject matter experts at NNSA Headquarters and at the NNSA Sandia Site Office (SSO), as well as during HSS independent oversight reviews of SNL-NM. HSS believes that this HSS consultation with NNSA meets the intent of the recommendation to ensure that the ACRR fuel is categorized consistent with DOE policy. Further, HSS believes that the planned publication of additional direction and guidance related to the "weight percent criteria," discussed under Recommendation 1, will satisfy the remainder of your Recommendation 2.

If you have any questions regarding this action, please contact Mr. Larry D. Wilcher or Dr. Richard L. Donovan, of my staff. Mr. Wilcher may be reached at (301) 903-5217 or by e-mail at larry.wilcher@hq.doe.gov. Dr. Donovan may be reached at (301) 903-3022 or by e-mail at richard.donovan@hq.doe.gov.

cc: Amy B. Whitworth, NA-72



Department of Energy
National Nuclear Security Administration
Washington, DC 20585



December 3, 2009

MEMORANDUM FOR: Herbert Richardson
Principal Deputy Inspector General

FROM: Michael C. Kane 
Associate Administrator
for Management and Administration

SUBJECT: Comments to IG Draft Report on Categories I and II Special
Nuclear Materials from SNL-NM; Proj. No. S09IS007;
IDMRS No. 2009-00280

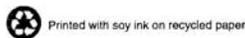
The National Nuclear Security Administration (NNSA) appreciates the opportunity to provide comments to the Inspector General's (IG) report, *Removal of Categories I and II Special Nuclear Material from Sandia National Laboratory-New Mexico*.

The focus of the IG review was the removal of Category I and II assets at Sandia National Laboratories (SNL), however, the vast majority of the report documents an IG concern with the categorization of the Annular Core Research Reactor fuel rods completely unrelated to the removal of Category I and II assets at SNL.

NNSA generally agrees with the report and the recommendation.

If you have any questions concerning this response, please contact JoAnne Parker, Acting Director, Policy and Internal Controls Management, at 202-586-1913.

cc: Manager, Sandia Site Office
Associate administrator for Defense Nuclear Security
Senior Procurement Executive
Director, Service Center



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