



**U.S. Department of Energy**  
**Office of Inspector General**  
**Office of Audits and Inspections**

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# INSPECTION REPORT

Review of Management and Accountability of  
Sealed Radioactive Sources Maintained at  
Department Sites

OAI-L-16-09

May 2016

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**Department of Energy**  
Washington, DC 20585

May 6, 2016

MEMORANDUM FOR THE MANAGER, LOS ALAMOS NATIONAL LABORATORY  
ACTING MANAGER, PACIFIC NORTHWEST NATIONAL  
LABORATORY

*April Stephenson*

FROM: April G. Stephenson  
Assistant Inspector General  
for Audits and Inspections  
Office of Inspector General

SUBJECT: INFORMATION: Inspection Report on the “Review of Management and Accountability of Sealed Radioactive Sources Maintained at Department Sites”

BACKGROUND

The Department of Energy facilities use sealed radioactive sources for medical and scientific testing and calibration of radiation detection instrumentation. A sealed source is radioactive material that is enclosed in a capsule or bonded to a nonradioactive material in order to prevent leakage or escape of radioactive material. Title 10 of the Code of Federal Regulations (CFR) Part 835, *Occupational Radiation Protection*, establishes criteria for managing a radiation protection program, including requirements for controlling and protecting sealed sources. In 2002, we issued a report titled *Inspection of the Accountability and Control of Sealed Radioactive Sources at Selected Department of Energy Sites* (DOE/IG-0544, March 12, 2002), which identified several examples of lack of adherence to either CFR requirements or local site requirements and procedures. Specifically, the identified examples included a sealed source that had not been leak tested or inventoried since May 2000, missing documentation, and a source custodian who had not taken refresher radiation safety training, as required. We initiated this inspection as a followup to our prior report to determine whether the sealed sources at the Los Alamos National Laboratory (LANL) and Pacific Northwest National Laboratory (PNNL) are managed in a safe and secure manner.

RESULTS OF INSPECTION

Nothing came to our attention to indicate that LANL and PNNL were not properly managing sealed sources that we selected for review. Both sites had controls in place to manage and account for sealed sources included in our review. Although we identified some administrative errors, we found that the errors were not material to the safe and secure management of the sealed sources. When these errors were brought to management’s attention, they immediately resolved the issues.

During our inspection, we verified that, as required, both sites inventoried and conducted leak tests for sealed sources selected for review within required timeframes. Additionally, we observed that the sites posted signs indicating radioactive material was present, stored the sources we inspected in an approved and secure location, and labeled source material with identifying information, such as the type of radioactive material and site-assigned unique numbers. In addition, we verified that all sealed source custodians we interviewed had completed the required radiation safety training.

Additionally, both LANL and PNNL developed an electronic database to record the required sealed source leak tests and inventory dates. The sites' electronic databases incorporated automatic notifications to source custodians of upcoming leak tests, inventories, and training due dates. Further, the databases contained a feature to automatically notify the responsible custodian's supervisor if the custodian did not take appropriate action by the due date.

Regarding leak tests, LANL officials told us that they use an independent reviewer to analyze the tests and electronically notify the requestor when the leak test results were available to review, included the manufacturer-assigned serial number (a unique number printed on or etched into the sealed source) in the database, and linked a barcode scanning system to another source tracking database. The electronic leak test process expedited requesting and reporting leak test results and also served as an auditable process for confirming when leak tests were requested and completed. Further, LANL included the manufacturer-assigned serial number that could be used to identify a sealed source should the label and sealed source become separated. The barcode scanning system was used to update the sealed source database record to reflect a change in location or custodian.

According to PNNL officials, the site's database incorporated other radioactive material reporting requirements and calculations, which streamlined processes and ensured safe and secure management of radioactive material. By incorporating other reporting requirements, such as material control and accountability requirements, staff could enter and track pertinent information in one database. Further, as a safety mechanism, the database automatically calculated the amount and type of radioactive material in a building to avoid exceeding facility hazard categorization limits; should a proposed sealed source transfer cause the building to approach the criticality limit, the database would alert the custodian immediately about the risk and not approve the transfer.

Based on these controls, we believe LANL and PNNL managed and accounted for their sealed sources in a safe and secure manner.

A formal response to this report is not required. We appreciate the cooperation of your staff during the inspection.

Attachment

cc: Associate Under Secretary for Environment, Health, Safety, and Security  
Deputy Secretary  
Chief of Staff  
General Counsel

## OBJECTIVE, SCOPE, AND METHODOLOGY

### OBJECTIVE

This review was initiated on September 29, 2015, as a followup inspection to our March 2002 inspection report titled *Inspection of the Accountability and Control of Sealed Radioactive Sources at Selected Department of Energy Sites*, which identified several examples of lack of adherence to either Code of Federal Regulations requirements or local site requirements and procedures. Specifically, it identified a sealed source that had not been leak tested or inventoried since May 2000, missing documentation, and a source custodian who had not taken refresher radiation safety training, as required. The objective of this review was to determine whether the sealed sources at the Los Alamos National Laboratory and Pacific Northwest National Laboratory are managed in a safe and secure manner.

### SCOPE

This inspection was conducted at the Department of Energy Headquarters in Washington, DC; Los Alamos National Laboratory in Los Alamos, New Mexico; and Pacific Northwest National Laboratory in Richland, Washington. This inspection was performed from September 2015 to May 2016 and focused on the site's effectiveness in managing sealed sources in a safe and secure manner from fiscal year 2010 until present. The inspection was conducted under Office of Inspector General project number S15IS020.

### METHODOLOGY

To accomplish this inspection objective, we:

- Interviewed Department officials, site Radiation Protection Program officials, and site source custodians, technicians, and managers.
- Conducted site visits to Los Alamos National Laboratory and Pacific Northwest National Laboratory.
- Reviewed and analyzed Federal, Department, and site-specific regulations, policies, and procedures.
- Reviewed internal sealed source tracking system.
- Conducted physical inspection of judgmentally selected sealed sources based on the source's accessibility.

We conducted this inspection in accordance with the Council of the Inspectors General on Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*. Those standards require that we plan and perform the inspection to obtain sufficient, appropriate evidence to provide a reasonable basis for our conclusions and observations based on our inspection objective. We believe the evidence obtained provided a reasonable basis for our conclusions and

observations based on our inspection objective. Accordingly, the inspection included tests of controls and compliance with laws and regulations to the extent necessary to satisfy the inspection 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 inspection. Finally, we relied on computer-based data, to some extent, to satisfy our objective. We confirmed the validity of such data, when appropriate, by observing database demonstrations of the system, conducting interviews, and analyzing source documents.

An exit conference was waived by Office of Science management on April 8, 2016, and National Nuclear Security Administration management waived an exit conference on April 13, 2016.

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Department of Energy  
Washington, DC 20585

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