



OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

# AUDIT REPORT

DOE-OIG-19-29

May 2019

**FOLLOWUP AUDIT ON NUCLEAR  
MATERIAL CONTROL AND  
ACCOUNTABILITY PROGRAM AT THE  
PORTSMOUTH PROJECT**



**Department of Energy**  
Washington, DC 20585

May 1, 2019

MEMORANDUM FOR THE MANAGER, PORTSMOUTH/PADUCAH PROJECT OFFICE

*Michelle Anderson*  
FROM: Michelle Anderson  
Deputy Inspector General  
for Audits and Inspections  
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Followup Audit on Nuclear Material Control and Accountability Program at the Portsmouth Project"

BACKGROUND

The Portsmouth Gaseous Diffusion Plant (Portsmouth) operated as a uranium enrichment facility from 1954 to 2001. Subsequently, the Department of Energy began an extensive cleanup of the site once the gaseous diffusion process was no longer operational. The decontamination and decommissioning contractor was required to develop, implement, and maintain a Nuclear Material Control and Accountability (MC&A) Program consistent with Department Order 474.2, *Nuclear Material Control and Accountability*, which required that accurate records of nuclear materials be maintained and physical inventories be conducted to provide assurance that nuclear material was not missing.

In our prior report, *Alleged Nuclear Material Control and Accountability Weaknesses at the Department of Energy's Portsmouth Project* (INS-O-15-04, May 2015), we found that improvements could be made to increase confidence that nuclear material was accounted for and that any compromises to tamper-indicating devices (TIDs) protecting nuclear material were replaced in a timely manner. Specifically, at the time of our prior review, we were told that 100 containers were recorded in the materials accounting system as empty when the containers actually held nuclear material. Portsmouth officials explained that the containers were recorded as empty because they were in-process and analysis had not determined the precise contents of the containers yet. However, Portsmouth may have been unable to detect missing nuclear material if any containers in-process went missing. We also reported that there was one instance in which a torn tamper-indicating device was not replaced in a timely manner. We initiated this followup audit to determine whether the Nuclear Material Control and Accountability Program had (1) adequate controls for accountability and accessibility of nuclear material, and (2) implemented corrective actions related to recommendations in our prior report.

## RESULTS OF AUDIT

Nothing came to our attention during our review to indicate that the Portsmouth MC&A Program had not implemented adequate controls for the accountability and accessibility of nuclear materials. Further, we concluded that the corrective actions taken to address the recommendations made in our prior inspection report ensured that the Portsmouth MC&A Program was meeting Departmental requirements. Specifically, the physical inventories we observed and our review of the tamper-indicating device program revealed proper implementation of site procedures. Similarly, our audit work revealed that the materials accounting system was capable of tracing material and included documentation supportive of transactions tested.

### **Physical Inventories**

We observed three Material Balance Area (MBA) inventories and determined that the Portsmouth MC&A Program's physical inventory procedures were consistent with the Department Order 474.2 requirement that all accountable quantities of nuclear material at a site be assigned to an MBA. Further, throughout our observations of inventories, we randomly selected six items from each MBA and verified that the container identification numbers and locations were accurate in the records. In fact, during management's reconciliation of the inventory, a discrepancy in an item number was properly identified and appropriately corrected, consistent with the site's established procedures.

### **Tamper-Indicating Device Program**

Our assessment of the TID program revealed proper implementation of the TID procedures. TIDs are seals or bags placed on containers that allow personnel to quickly identify if the nuclear material container has been tampered with or opened. TIDs are single use devices that, once breached, cannot be reapplied or reassembled.<sup>1</sup> In response to our prior report finding where a torn TID bag was not replaced in a timely manner, Portsmouth management re-emphasized its TID process requirements. Further, the Portsmouth MC&A Program established the practice of the TID Administrator informing the MC&A Manager of any replacement requests to ensure tracking by management occurs and to reduce the occurrence of breached TIDs not being replaced in a timely manner. Portsmouth MC&A Program officials told us that no incidents of breached TIDs not being replaced in a timely manner have occurred in the last 4 years. We reviewed the TID application/removal records for the past year to verify that all were replaced in a timely manner and did not identify any discrepancies. In addition, during our inventory observations, we randomly selected six items from each MBA and verified tamper-indicating device numbers, as appropriate.

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<sup>1</sup> The Portsmouth MC&A Program Manager told us that TIDs were required only on containers that held oxides. At one time, Portsmouth used a nuclear material recovery process that took enriched uranium from various types of uranium-bearing scrap materials and converted it into solid uranium oxide material. However, the Portsmouth MC&A Program Manager stated that the recovery process changed and, as a result, Portsmouth was no longer producing oxides. Therefore, the Portsmouth MC&A Program management was considering eliminating the TID program once the remaining oxide containers were removed from the site.

## Accounting System

Our review of the materials accounting system found that the system was capable of tracing material from receipt, or creation, to disposal and included the necessary source documentation for the individual transactions. Department Order 474.2 states that material accounting encompasses the materials accounting system, which must accurately reflect the nuclear material inventory and provide a complete audit trail for all accountable nuclear material from receipt through disposition. We judgmentally selected four items to trace through the materials accounting system from receipt, or creation, to the nuclear material's status at the time of our site visit. In each instance, we had the accountant show us all transactions related to the items. We then chose specific transactions to further examine. For example, one item included in our review had been transferred from one MBA to another MBA. The accountant showed us the entries documenting the move in the materials accounting system, as well as the Nuclear Material Transfer form supporting the location change notated in the materials accounting system. We verified that the form had the appropriate signatures. No discrepancies were noted in either the accounting information or the source documentation we reviewed.

For the 100 containers with problems in our prior review, the Portsmouth MC&A Program Manager stated that the 100 containers in-process and recorded as empty had been removed from the site. As part of the corrective action plan, the Portsmouth MC&A Program ensured that an estimated nuclear material volume level was recorded while the containers were on site, re-emphasized procedure requirements to field personnel for reporting interim values, and expanded the use of interim values to all items. In addition, we were told that Portsmouth MC&A Program engineers had increased their reviews of the database to ensure that relevant data, such as interim values, were being entered. The Portsmouth MC&A Program Manager indicated that there were 20 containers currently at the site similar to the in-process containers we reported on in our prior report. The Portsmouth MC&A Program was using interim values for these 20 in-process items.

## Attachments

cc: Deputy Secretary  
Chief of Staff  
Under Secretary for Science  
Assistant Secretary for Environmental Management

## **OBJECTIVE, SCOPE, AND METHODOLOGY**

### OBJECTIVE

We conducted this audit to determine whether the Nuclear Material Control and Accountability Program had (1) adequate controls for accountability and accessibility of nuclear material, and (2) implemented corrective actions related to recommendations in our prior report.

### SCOPE

This followup audit was performed between August 2018 and April 2019 at the Portsmouth Gaseous Diffusion Plant and Portsmouth/Paducah Project Office near Piketon, Ohio. The audit was conducted under Office of Inspector General project number A18LA040.

### METHODOLOGY

To accomplish our objective, we:

- Reviewed applicable laws, regulations, and directives related to nuclear material control and accountability;
- Reviewed the processes and procedures for implementation of the Nuclear Material Control and Accountability Program;
- Reviewed relevant reports issued by the Office of Inspector General, the Government Accountability Office, and the Department of Energy Office of Enterprise Assessments, as well as program self-assessments and field office assessments;
- Held discussions with officials from the Department, including Federal and contractor staff associated with the Nuclear Material Control and Accountability Program;
- Reviewed corrective actions taken in response to our prior inspection findings; and
- Conducted a site visit, including observations of the physical inventories and a review of the accounting system. We judgmentally selected four material transactions to trace through the accounting system to test the accuracy of information recorded. Our testing included a review of the supporting documentation in the accounting system for each transaction selected to verify adequate support for system data.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. The audit included tests of internal controls and compliance with the laws and regulations to the extent necessary to satisfy the audit

objective. Additionally, we assessed the Department's implementation of the *GPRRA Modernization Act of 2010* as it relates to our audit objective and found that the Department had not established performance measures.

Because our review was limited, it would not have necessarily disclosed all internal control deficiencies that may have existed at the time of our audit. We relied on computer-processed data to achieve our audit objective and determined that the data provided was sufficiently reliable for the purposes of our audit objective.

An exit conference was held on March 29, 2019.

## PRIOR REPORT

- Inspection Report [\*Alleged Nuclear Material Control and Accountability Weaknesses at the Department of Energy's Portsmouth Project\*](#) (INS-O-15-04, May 2015). The Office of Inspector General received a complaint that nuclear material accountability and access controls at the Portsmouth Gaseous Diffusion Plant were not adequate. As a result of our work, we concluded that, in general, nothing indicated that the required nuclear material access controls were not in place. However, we identified improvements at the Portsmouth Gaseous Diffusion Plant that could be made to increase confidence in the site's Material Control and Accountability Program. We recommended that the Manager of the Portsmouth/Paducah Project Office ensure that nuclear material volume levels in containers were recorded in the accounting system when pending processing; re-emphasize the tamper-indicating device process requirements and require that followup be conducted to ensure that tamper-indicating devices were replaced in a timely manner; and evaluate the effectiveness of the tamper-indicating device program and adjust the program as necessary. Management concurred with the report's recommendations and took immediate corrective actions.

## **FEEDBACK**

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