



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

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# INSPECTION REPORT

Allegations Regarding Management of Highly  
Enriched Uranium

INS-L-15-03

September 2015

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**Department of Energy**  
Washington, DC 20585

September 1, 2015

MEMORANDUM FOR THE ADMINISTRATOR, NATIONAL NUCLEAR SECURITY  
ADMINISTRATION

A handwritten signature in blue ink, appearing to read "Rickey R. Hass".

FROM: Rickey R. Hass  
Deputy Inspector General  
for Audits and Inspections  
Office of Inspector General

SUBJECT: INFORMATION: Inspection Report: "Allegations Regarding  
Management of Highly Enriched Uranium"

BACKGROUND

The Department of Energy's (Department) Y-12 National Security Complex (Y-12) has processed highly enriched uranium (HEU), a special nuclear material (SNM), for more than 60 years. Y-12 is required to maintain inventories of nuclear material in Categories I – IV based on the material's attractiveness level and weight with Category I material as the highest rating. Further, Department Order 474.2A, *Nuclear Material Control and Accountability*, requires nuclear material programs to detect, assess and deter unauthorized access to any category of nuclear material.

We received allegations that SNM was not appropriately managed at Y-12. Specifically, we were informed that on January 22, 2014, HEU samples were discovered in the pocket of coveralls located on a laundry truck that annunciated an alarm as the truck tried to exit Y-12's Protected Area. Although Y-12 had completed an assessment of this incident, the allegations indicated additional actions may be warranted. As such, we reviewed: 1) safety and health issues related to the handling of SNM during this incident; 2) internal controls for the tracking and handling of SNM; and 3) process and procedure weaknesses regarding the SNM detection and alarm response to this incident. We initiated this inspection to examine the facts and circumstances surrounding the allegations.

RESULTS OF INSPECTION

We substantiated the allegations related to safe handling of SNM, internal controls for the tracking and handling of SNM samples, SNM detection procedures, and SNM alarm response processes. However, prior to our review, Y-12 federal and contractor officials conducted

internal investigations concerning the incident and generally implemented corrective actions to address most of the issues outlined in the allegations. Y-12's corrective actions addressed the issues related to SNM sample tracking, handling, detection, and alarm response.

However, our review revealed that Y-12 had not completed corrective actions concerning: 1) a safety violation that occurred during the discovery of the HEU samples, and 2) the untimely notification to the Plant Shift Superintendent Office (PSS) about the discovery of the HEU samples. Upon bringing these issues to the attention of Y-12 officials, they agreed to implement corrective actions for both issues.

### **Safety and Health Issue Related to Handling of SNM**

Our inspection revealed that a corrective action was not completed for a safety violation that was issued to the personnel of the Y-12 production facility responsible for the HEU samples. The safety violation was issued because the facility's personnel did not adhere to Y-12 procedure Y56-001, *Abnormal Condition Involving Fissile Material*, which required personnel who discovered the HEU samples to establish at least a 15 foot boundary around the samples, make no attempt to correct the situation, and notify Nuclear Criticality Safety (NCS) about the discovery. The establishment of boundaries and the NCS notification mitigates the risk of adverse health effects such as radiation sickness, increased risk of cancer, and possible death. Nonetheless, NCS determined that the requirements of the procedure to establish a safe stand-off distance were not met.

We determined the requirements were not met, in part, because it was unclear as to whether Y56-001 procedures applied outside of the production facilities, as in this case. Also, we were told that training on this procedure did not specify that the procedure should be used outside of the production facilities. Although Y-12's internal investigation recommended a corrective action for this issue, and a corrective action was provided to NCS by a Y-12 manager, it was denied due to insufficient information. After the corrective action was denied, a follow-up for the corrective action was never completed due to an oversight. However, prior to the completion of our review, Y-12 officials agreed to implement corrective actions to address the safety violation by revising internal procedures to invoke Y56-001. This allows Y56-001 to be used as guidance for handling SNM incidents that occur outside of production facilities, including establishing boundaries and notification.

In addition to revising internal procedures, Y-12 officials communicated to all personnel how to respond to fissile material that is present in an unapproved location. This information has also been incorporated into Y-12's General Employee Training that is required to be taken by new hires as initial training and by all personnel as biennial refresher training.

Although this safety procedure was not followed, the personnel responsible for finding the HEU samples were wearing the proper personal protective equipment (PPE) to transport low-level amounts of nuclear material such as the two HEU samples in this incident. According to a Y-12 Subject Matter Expert (SME), the threat of a nuclear criticality accident occurring during the incident was very low. The SME stated that the minimum critical mass for a nuclear criticality accident is over 700 grams. The samples in question contained only 20 grams of uranium.

Therefore, the possibility of a health related issue occurring during the handling of the HEU samples was low because personnel wore proper PPE and the amount of uranium involved in the incident was significantly below the minimum critical mass for a nuclear criticality accident.

### **Untimely Notification to PSS**

Additionally, we found that a corrective action was not implemented to address the untimely notification to the PSS about the discovery of the HEU samples. Based on our review of the PSS logbook, we determined that PSS officials were not notified about the discovery of the HEU samples until approximately 8 hours after the incident. Y-12's procedure titled Y19-115, *Reporting and Handling Security Concerns and Events*, requires immediate PSS notification if a potential security-related issue regarding nuclear material has occurred. PSS is responsible for ensuring that pertinent organizations such as Y-12's Safeguards and Security are aware of any security incident that occurs at Y-12.

We determined that the untimely PSS notification occurred because of confusion between personnel from the HEU samples production facility and Y-12's Radiological Control team. A Radiological Control member indicated that they assumed the facility's personnel would notify PSS about the discovery of the HEU samples. An employee from the facility indicated that they assumed PSS was already aware of the incident, but could not recall who may have notified PSS or when PSS was notified. This confusion led to the delayed PSS notification.

PSS staff indicated that that they reported this untimely notification to Y-12 officials but PSS was never given a response back from the officials. Further, after reviewing Y-12's corrective action plan, we found that a corrective action was never developed for this issue. After we brought procedure Y19-115 to Y-12 officials' attention, they developed corrective actions to ensure that their employees are aware that PSS should be immediately notified during incidents involving nuclear material.

### **SNM Sample Tracking and Handling**

We confirmed through interviews, a walk-through, and reviews of current local procedures that Y-12 officials had taken action to improve the tracking and handling of HEU and any other SNM samples. Although Y-12 already had a bar code tracking system in place prior to the incident, SNM samples were exempt from bar code tracking because SNM samples were considered Category IV nuclear material due to their low weight. However, newly developed Y-12 procedures require the inclusion of SNM samples in their bar code tracking system. Further, after interviewing chemical operators and reviewing revised Y-12 procedures, we confirmed that chemical operators are no longer allowed to place samples in their pockets and must check their pockets before removing their coveralls.

### **SNM Detection and Response**

Y-12 managers implemented several corrective actions to mitigate the risk of unauthorized releases of SNM. We determined that the chemical operators performing SNM monitoring duties were provided with new SNM detection instruments and retrained on the scanning methods used to detect SNM in items such as laundry and trash. Also, performance of SNM

monitoring duties currently requires the implementation of the two-person rule. Further, area supervisors are required to ensure that the two chemical operators performing SNM monitoring duties are trained and authorized personnel. Y-12 management also issued required reading to reemphasize to Senior Supervisory Watch personnel that they need to ensure procedural requirements are met and outgoing transfer station operations are conducted with the appropriate level of rigor and formality.

Furthermore, Y-12 managers revised SNM alarm response procedures to include a Nuclear Material Control & Accountability (NMC&A) response team. The NMC&A team will now scan items first with the intent of detecting SNM if an SNM alarm is annunciated. If SNM is not found, Radiological Control will respond to determine if the alarm was annunciated due to contamination of items that are used around SNM.

### **Impact and Path Forward**

Due to the risk of the unauthorized release of SNM, it is imperative that all Y-12 personnel understand that safety and security procedures should be followed to mitigate the risk of adverse health effects when an incident involving nuclear material occurs. Because of the progress we observed to improve controls, we are not making recommendations or suggestions. We appreciate the cooperation of your staff during our inspection.

#### Attachments

cc: Deputy Secretary  
Chief of Staff

## OBJECTIVE, SCOPE AND METHODOLOGY

### OBJECTIVE

We received allegations that special nuclear material (SNM) was not appropriately managed at the Y-12 National Security Complex (Y-12). Specifically, we were informed that on January 22, 2014, highly enriched uranium (HEU) samples were discovered in the pocket of coveralls located on a laundry truck that annunciated an alarm as the truck tried to exit Y-12's Protected Area. Although Y-12 had completed an assessment of this incident, the allegations indicated additional actions may be warranted. As such, we reviewed: 1) safety and health issues related to the handling of SNM during this incident; 2) internal controls for the tracking and handling of SNM; and 3) process and procedure weaknesses regarding the SNM detection and alarm response to this incident. We initiated this inspection to examine the facts and circumstances surrounding the allegations.

### SCOPE

We conducted fieldwork for this allegation-based inspection between September 2014 and September 2015 at Y-12. The inspection was conducted under the Office of Inspector General project number S14IS013.

### METHODOLOGY

To accomplish our objective we performed the following:

- Reviewed Federal, Department and local policies, procedures, and requirements for Nuclear Material Control and Accountability;
- Interviewed key personnel involved in the incident;
- Conducted a walk-through of the facility;
- Determined if a tracking system is used for material samples;
- Determined how highly-enriched uranium samples are stored;
- Reviewed training documents to verify if material handlers and supervisors are receiving training on SNM detection;
- Reviewed internal operating procedures for responding to SNM alarms at entrance/exit gates;
- Reviewed documentation relating to the 100% inventory completed on January 24, 2014.

We conducted this allegation-based 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-processed data, to some extent, to satisfy our objective. We confirmed the validity of such data, when appropriate, by reviewing source documents and conducting interviews and physical observations. Management waived the exit conference.

## **FEEDBACK**

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