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United States Government

Department of Energy

Memorandum

DATE: August 15, 2007 Audit Report Number: OAS-L-07-22

REPLY TO:
ATTN OF: IG-34 (A06GT006)

SUBJECT: Report on "Hazardous Chemicals Inventory Management at the Savannah River Site"

TO: Manager, Savannah River Operations Office

BACKGROUND

The Savannah River Site (Savannah River) maintains large inventories of hazardous chemicals for its scientific, environmental cleanup and production operations. Many of these chemicals are known carcinogens; some are corrosive, while others are highly flammable. As such, these chemicals can pose serious health and safety risks to workers and members of the public, the environment, and to emergency first responders if not properly managed and controlled. Department of Energy (Department) regulations require that the hazards of these chemicals be assessed and that on-hand quantities be tracked for both emergency planning and mitigation of associated health and safety risks. Site-level hazardous chemical inventory systems provide the information necessary to perform these activities and to satisfy report requirements established by the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

The Office of Inspector General (OIG) issued a report on *Chemical Safety Protocols at the Pantex Plant*, (DOE/IG-0756, February 2007). This inspection found significant inventory discrepancies at the Pantex Site. It concluded that an inaccurate inventory can have potential negative effects on the emergency assessment and planning process. Because of their importance to the health and safety of workers, the public and the environment, we initiated this audit to determine whether Savannah River adequately manages its hazardous chemical inventories and have made adequate emergency preparations to deal with incidents involving these chemicals.

RESULTS OF AUDIT

Our review disclosed that Savannah River had developed emergency action plans and procedures to deal with incidents involving hazardous chemicals. These plans specifically considered the impact that the presence of hazardous chemicals could have on emergency situations such as fires, spills, and unplanned releases. While these plans appeared to be appropriate, their ultimate deployment and the effectiveness of planned emergency responses could be diminished because of

problems we noted with the accuracy of the hazardous chemical inventory system at the site.

Our test of Savannah River's hazardous chemical inventory revealed that 84 of 251 (about 33 percent) of the items we sampled could not be found in the individual laboratories or facilities recorded in the inventory system. In most cases, the quantities observed were less than that recorded in the inventory system. In some examples, however, the inventory system indicated that no chemicals were present in the laboratory even though we observed that they were. The hazardous chemicals containers we sampled came in a variety of sizes but typically held from .5 to 2.5 liters.

Savannah River maintains thousands of containers of hazardous chemicals at the site, with many kept in a given laboratory or storage area. Because the site does not use a container specific inventory control system, we could not readily determine whether the chemicals that we could not locate were missing, had been used, or had simply been transferred to other on-site facilities.

Inventory Management Practices

These inventory discrepancies occurred because site officials did not properly update the chemical management inventory system and periodic reconciliations were not effective or documented. While the Savannah River Management Policies Manual requires chemical management officials to update the system every 30 days to reflect the transfer or disposal of chemicals, our review disclosed that such updates were not always taking place. Reconciliation procedures consisted of periodically sending an e-mail to the same chemical managers that were not properly updating the inventory management system asking them to affirm that their inventory records were accurate. No additional reconciliation or verification was performed by site-level or contractor officials.

Site-level officials told us that they did not expect the hazardous chemical inventory at the site to be perfect. The official in charge of the Chemical Management Center indicated that he believed that the error rate across the Department complex could be as high as 25%, depending upon the level of detail captured in the inventory system (i.e. to the room level, container type, etc.) as well as what is classified as a discrepancy. He also indicated that controls to reduce inventory error rates were costly and required a significant amount of manpower to implement. Instead of relying solely on the computer inventory systems, site officials also indicated that they monitored the overall inventory through the use of analytical procedures to determine whether it was trending up over a given period. Finally, officials told us that they used a conservative approach of assuming that all chemical containers were full and did not decrement the system until the entire container was used.

While management's approach might help ensure that overall quantities of chemicals are properly reported to EPA and OSHA, it does not ensure that emergency management considerations are adequately addressed. For example, in

one possible scenario, first responders may take action to respond to a fire based on the mistaken belief that water reactive chemicals are not present in a facility.

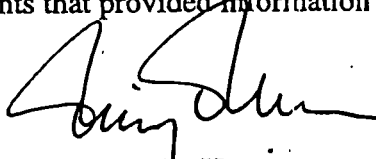
Impact on Health, Safety and Regulatory Compliance

Exposure to hazardous chemicals has the potential for serious health consequences and accidental releases can result in serious harm to the environment. While adequate measures appear to be in place for planned work activities, a high rate of discrepancies in hazardous chemical inventories could potentially have a negative impact on emergency action planning. The emergency preparedness planning at Savannah River accounts for materials with specific hazards, within explicit locations in the facilities. Therefore, if the materials are transferred from one location to another, there may be consequences. Given this emergency planning does not focus on specific amounts of these materials, simply their presence, transfers of chemicals into zones should be evaluated and recorded.

SUGGESTION

To address the issues in this report, we suggest that the Manager, Savannah River Operations Office, require responsible contractors to provide formal documentation of the quantity of and reason for the adjustments made for each of the inventory items during the periodic reconciliations. We also suggest that the Savannah River Operations Office verify this reconciliation process during the next inventory period.

No recommendations are being made in this report and a formal response is not required. We appreciate the cooperation of the Savannah River Operations Office and various Departmental elements that provided information or assistance.



Rickey R. Hass
Assistant Inspector General
for Financial, Technology, and Corporate Audits
Office of Audit Services
Office of Inspector General

Attachment

Attachment

OBJECTIVE

The objective of our audit was to determine whether selected Department of Energy (Department) field sites adequately manage their hazardous chemicals inventories and have made adequate emergency preparations to deal with incidents involving these chemicals.

SCOPE

The audit was performed between August 2006 and July 2007. Audit work was primarily performed at the Department's Headquarters in Washington, D.C. Site visits were made to the Savannah River Site (Savannah River) in Aiken, South Carolina.

METHODOLOGY

To accomplish the audit objective, we:

- Identified the criteria to define a hazardous chemical;
- Met with chemical specialists in the Department's Health, Safety and Security group to discuss best practices and obtain an overview of chemical management;
- Reviewed the relevant Federal regulations, Department orders and other documents regarding the management and control of hazardous chemicals;
- Obtained information from various sites including lists of their hazardous chemicals;
- Reviewed the policies and procedures for chemical handling at the sites visited;
- Visited sites to verify their hazardous chemical inventory; and,
- Analyzed the results of the site visits.

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 objectives of the audit. We assessed the Department's compliance with the Government Performance and Results Act of 1993 and found that the Department had not established performance measures related to chemical management. 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 performed limited test work of computer processed data and determined that we could not rely on the data produced by the systems because, as noted in the body of the report, they were not adequately maintained. We held an exit conference with Savannah River Site officials on February 9, 2007 and management generally agreed with our observations and conclusions.