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Office of Inspector General
Office of Audit Services

Infrastructure Series

Audit Report

Infrastructure Improvements at the Hanford Site

OAS-B-03-03

May 2003

Department of Energy

Washington, DC 20585

May 7, 2003

MEMORANDUM FOR THE ASSISTANT SECRETARY

FROM: William S. Maharay
Deputy Assistant Inspector General
for Audit Services
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "Infrastructure Improvements at the Hanford Site"

BACKGROUND

The Department of Energy's Hanford Site was established in 1943 to support the production of plutonium for the Manhattan Project. Occupying about 560 square miles along the Columbia River in southeastern Washington, the site is now engaged in the world's largest cleanup effort involving radioactive and hazardous wastes generated during the plutonium production era. Today, many of the site's facilities and much of its infrastructure have deteriorated and are operating beyond design life. Further, a number of general-purpose buildings will soon reach the end of their useful lives unless significant renovations are completed.

In October 2000, the Office of Environmental Management required the Richland Operations Office to address these concerns by developing a site infrastructure restoration plan with a ten-year funding profile and to update the plan annually to reflect changing needs and funding availability. The plan was designed to identify the site's facility and infrastructure needs considering current site conditions and capacities, the extent of deferred maintenance, cleanup plans, and other missions. This audit was conducted to determine whether Richland was addressing its infrastructure requirements.

RESULTS OF AUDIT

We found that, over the past few years, Richland has faced a number of situations related to deteriorating infrastructure at the Hanford site. We also observed that between 1998 and 2002, Hanford's deferred maintenance had risen dramatically, from about $21 million to over $186 million. In addressing infrastructure needs, Richland had not always followed established policy, nor had it implemented an integrated system for managing facility maintenance. Further, without an adequate infrastructure to meet mission needs, the Department risks being unable to complete the Hanford site's cleanup mission safely and within established timeframes. The attached report includes specific recommendations intended to help Richland address this concern.

This report is one in a series that the Office of Inspector General has prepared regarding aspects of the Department's efforts to address its infrastructure requirements. For the past several years, our office and other reviewers have noted that mission-critical infrastructure has been deteriorating at an alarming rate and that required maintenance was often not being performed. Our other reports discuss infrastructure issues facing the Department's national security and science program areas.

MANAGEMENT REACTION

Management generally concurred with the audit finding and three of the four recommendations. However, management stated that it was not aware of any infrastructure deficiencies that require immediate attention and are critical to health and safety of employees. To ensure that appropriate infrastructure needs are addressed, management stated that it would review the Hanford contractor's integrated priority list to verify that safety and health related projects are properly included by September 30, 2003. We consider management's comments to be responsive to the intent of the recommendations.

Attachment

cc: Chief of Staff
Under Secretary for Energy, Science and Environment
Assistant Secretary for Environmental Management
Manager, Richland Operations Office

INFRASTRUCTURE IMPROVEMENTS AT THE HANFORD SITE

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INFRASTRUCTURE ACTIVITIES

Infrastructure Concerns

Over the past few years, Richland has faced a number of situations related to deteriorating infrastructure at the Hanford Site. For example:

- In July 2002, a raw water line at the 200 West Area near the S Farms failed and spilled an estimated 1.7 million gallons of water into the surrounding areas. Although this particular leak was eventually contained, water leaks are a major concern for site management due to their potential to spread contaminants. A leak that penetrates a contaminated area could flush contaminants through to the groundwater, further complicating and slowing down the cleanup process.

- In 2001, a trailer at the 233-S Decommissioning Project in the 200 West Area caught fire because preventive maintenance had not been performed on a heating unit. The trailer was not occupied at the time; however, the fire caused extensive smoke and heat damage inside the trailer.

- In November 2001, engineers determined that a training building did not have "a properly finished roof/ceiling structure for normal occupancy." The condition assessment survey indicated that the facility was used by as many as 100 personnel daily.

- Many projects to repair deteriorating facility components and replace aging instrumentation at an analytical service laboratory have been postponed. This facility currently supports several critical cleanup missions at the Hanford Site including the Hanford Tank Farms, transuranic waste shipments to the Waste Isolation Pilot Plant, and other environmental restoration projects. In addition, this facility will be needed to support future cleanup missions including the Waste Treatment Plant currently under construction.

We also noted that deferred maintenance for the Hanford Site had increased significantly over the past several years. Specifically, Richland's deferred maintenance account balance grew from about $21 million in 1998 to more than $186 million in 2002, nearly a nine-fold increase. Management stated that the $186 million figure accurately reflects the extent of deferred maintenance in 2002; however, the data entered in 1998 was incomplete and the $21 million figure is not accurate. Nevertheless, such a large increase in deferred

maintenance is another indicator that Richland may face significant challenges in maintaining a safe and environmentally sound infrastructure for its mission-essential work.

Identifying and Planning for Infrastructure Improvements

Our audit disclosed a number of weaknesses in Richland's prioritization and planning efforts that, if corrected, could help to mitigate the potential seriousness of future infrastructure problems.

With regard to prioritization, we found that Richland's May 2001 ten-year infrastructure restoration plan identified a total of 663 infrastructure projects that were given a priority. Of these, 244 were designated "high priority." However, only one high priority project was scheduled to begin in 2002. An additional 56 projects were also scheduled for 2002, but none of these were assigned a priority and consisted primarily of surveillance and deactivation activities. We concluded that either Richland needed to revisit its scheduling – to address the highest priority jobs first – or do a better job of prioritization. In either case, Richland's approach did not appear to be logical or well-documented.

In addition, Richland did not always follow established policy for developing restoration plans or maintain a centralized, integrated facility maintenance system. The Department's *FY 2001 Performance and Accountability Report* and Environmental Management guidance for preparing infrastructure restoration plans require that the plans address mission-critical infrastructure requirements through an appropriate mix of renovation and new construction. The plans are to exclude projects for routine surveillance and maintenance, the demolition and disposal of buildings, and other activities that are not directly related to the restoration of mission-critical infrastructure. We found, however, that the Hanford Site plan included more than $20 million for routine surveillance and maintenance and disposal activities. For example, $1.4 million was slated for surveillance and maintenance of Facility 272E, and $296,000 for surveillance, maintenance, and disposal of Facility 2710E. Both of these facilities are in standby mode, unused, until money becomes available for demolition. The implication is that scarce funds that could be used to upgrade mission-essential facilities may be used, instead, to maintain unused buildings. It was unclear from the site plan that this was the most logical use of resources. In response to the draft report, management stated that most of the $1.4 million associated with Facility 272E was for demolition rather than surveillance and maintenance; however, the infrastructure plan included the entire amount as surveillance and maintenance.

Richland had also not established a centralized, integrated system to manage facility maintenance at the Hanford Site. The site had multiple systems and databases that supported specific portions of the maintenance program. The prime contractor maintained two separate systems supported by 17 different databases. However, neither of these systems contained the integrated financial information needed to determine how much is spent on maintenance activities. In fact, it took the prime contractor more than four months to develop an estimate of maintenance expenses for FY 2001 and an exact figure could not be determined. Thus, Richland could not identify costs on a facility-by-facility basis, and, therefore, could not determine the most cost-effective approach to manage or prioritize maintenance or infrastructure restoration needs.

Finally, the Office of Inspector General is aware that the Assistant Secretary for Environmental Management has initiated significant changes in the Department's complex-wide approach to facility cleanup. These changes, based on Environmental Management's 2002 *Top-to-Bottom Review,* emphasize accelerated, risk-based cleanup. As such, previous assumptions about how much funding should be devoted to infrastructure restoration may no longer be valid. Specifically, a senior Department manager told us that Environmental Management plans to devote a larger share of its resources to activities that lead to early site closure, and a smaller share to infrastructure restoration. While we recognize the advantages of such a policy shift, our audit demonstrated that, at least at the Hanford Site, additional attention is needed to ensure that whatever funds are dedicated to infrastructure are maximized to ensure that workers are safe, surrounding areas are protected, and site missions are not interrupted.

During the audit, management started several initiatives to improve the focus on critical infrastructure needs at Hanford. For example, Richland renegotiated the contract with its site services contractor to keep the current infrastructure in acceptable repair and to identify the infrastructure necessary to support the accelerated cleanup initiative. Also, Richland is in the process of establishing an oversight process to ensure critical facilities are adequately maintained. Finally, Richland has added an element on infrastructure to the performance plans of the Department managers responsible for Hanford's infrastructure. Since these are new initiatives and some had not been finalized, we were unable to validate the effectiveness of management's actions.

Impact on Safety, Mission Accomplishment, and Operational Efficiency

As noted in a January 2002 memorandum from the Assistant Secretary for Environmental Management, "The Department risks not being able to meet existing mission objectives if the condition and functionality of its facilities are not adequately addressed. Aging facilities are operating beyond design life and have deteriorated due to insufficient maintenance...In addition, poor infrastructure conditions are resulting in increased safety and health risks...It is critical that the Department address infrastructure repair, replacement, upgrade, and long-term management in order to mitigate the deteriorating conditions of the Department's facilities."

Consistent with the Assistant Secretary's expressed concerns, the conditions we found at the Hanford Site have the potential to directly affect safety, health, and mission completion. Under the Department's most up-to-date scenario, the site will continue to operate until at least 2035. As such, issues associated with aging facilities will become of even greater significance. Unless such issues are promptly and systematically addressed, the accelerated closure date could, itself, be jeopardized.

RECOMMENDATIONS

We recommend that the Manager, Richland Operations Office:

1. Develop and implement a site plan, consistent with Department and Environmental Management policy, that fully identifies mission critical infrastructure and prioritizes projects accordingly;

2. Immediately address maintenance and infrastructure restoration needs that could compromise the health and safety of employees;

3. To the extent possible, consolidate and integrate site infrastructure systems to ensure consistency; and,

4. Work with Office of Environmental Management headquarters to ensure that required infrastructure repairs and upgrades are identified and funded consistent with Environmental Management's risk-based accelerated cleanup approach.

MANAGEMENT REACTION

Management generally concurred with the audit finding and three of the four recommendations. Management only partially concurred with recommendation 2, stating that it is not aware of any infrastructure deficiencies that are critical to safety and health. The contractor is responsible for maintaining employee safety and health, and the contract allows the Department to penalize the contractor if appropriate priority is not given to safety and health risks. Management stated that they will review the contractor's integrated priority list to verify that safety and health related projects are properly included by September 30, 2003. Management's verbatim comments are included as Appendix 3.

PRIOR REPORTS

- *Management Challenges at the Department of Energy* (DOE/IG-0538, December 2001). The report disclosed that DOE has ten challenge areas that need to be addressed. Infrastructure and Asset Management was included in the challenge areas. The report found that the infrastructure is deteriorating at an alarming pace and may not be able to meet mission requirements.

- *Facility Maintenance at the Idaho National Engineering and Environmental Laboratory (INEEL)* (WR-B-01-04, March 2001). The audit found that INEEL had not maintained its facilities in a safe and economical manner. Serious facility-related problems occurred because management did not, in part, devise a computerized maintenance management system that contained complete and reliable information. As a result, Idaho's facility maintenance program threatens mission accomplishment, personal safety, and it is uneconomical.

- *Management of the Nuclear Weapons Production Infrastructure* (DOE/IG-0484, September 2000). The audit found that the nuclear weapons production infrastructure has not been adequately maintained, resulting in delays in weapons modifications, remanufacture, dismantlement, and testing. The Department has not fully implemented a process to link budget information with facility requirements, resulting in, among other things, increased restoration costs. Officials estimated that the Department must invest $5 billion to $8 billion more than current budgeted amounts over the next 10 years to offset the effects of delayed or neglected infrastructure activities.

- *Facilities Information Management System* (DOE/IG-0468, April 2000). The audit revealed that the Facilities Information Management System (FIMS) did not contain accurate and complete information. Therefore, it did not provide the Department with reliable information on its real property inventory. As a result, the Department's ability to rely on FIMS for decisions concerning real property was questionable.

Appendix 2

OBJECTIVE

The objective of the audit was to determine whether Richland has developed and implemented an effective infrastructure restoration plan for the Hanford Site.

SCOPE

The audit was performed between January and December 2002, at the Hanford Site in Richland, Washington, and included infrastructure restoration activities and plans for Fiscal Years 2002 through 2011. The audit identified a material internal control weakness that management should consider when preparing its yearend assurance memorandum on internal controls.

METHODOLOGY

To accomplish this audit objective, we:

- Researched applicable Federal and Departmental regulations;
- Reviewed prior audit reports related to infrastructure maintenance and restoration;
- Reviewed the FY 2001 Performance and Accountability Report;
- Evaluated DOE Environmental Management guidelines for developing site infrastructure restoration plans;
- Analyzed site infrastructure restoration plans for the Hanford Site;
- Reviewed the site's facility condition assessment surveys; and
- Interviewed Department and contractor personnel at the Hanford and Savannah River Sites, the Idaho National Engineering and Environmental Laboratory, and the Office of Environmental Management, regarding the development and implementation of site infrastructure restoration plans.

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 audit objective. Accordingly, we assessed internal controls and performance measures established under the *Government Performance and Results Act of 1993* related to the Department's implementation of the infrastructure restoration plans at the Hanford Site. 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 did not assess the reliability of computer-processed data because only a very limited amount of such data was used during the audit.

Management waived the exit conference.

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United States Government **Department of Energy**

memorandum

DATE: April 7, 2003

REPLY TO ATTN OF: EM-43 (Ray Won, 301-903-4526)

SUBJECT: Office Of Inspector General Draft Audit Report Entitled "Infrastructure Restoration at the Hanford Site" (draft)

TO: Frederick D. Doggett, Deputy Assistant Inspector General for Audit Services

The purpose of this memorandum is to provide comments on the subject report. Your draft report recommends that the Manager of the Richland Operations Office (RL) take action to: (1) develop and implement a site plan, consistent with Department and Office of Environmental Management (EM) policy, that fully identifies mission critical infrastructure and prioritizes projects accordingly; (2) immediately address maintenance and infrastructure restoration needs that could compromise the health and safety of employees; (3) consolidate and integrate site infrastructure systems to ensure consistency to the extent possible; and (4) work with EM Headquarters to ensure that required infrastructure repairs and upgrades are identified and funded consistent with EM's risk-based accelerated cleanup approach.

I agree, in general, with the overall facts and conclusions presented in the draft report and concur with Recommendations -1, -3 and -4. I partially concur with Recommendation -2 because we are not aware of any current deficiencies that are critical to safety and health. Alternative solutions can effectively maintain worker safety and health at inactive facilities. Current and planned actions for each recommendation are addressed below. Detailed comments regarding the draft report findings are contained in the attachment to this memorandum.

Recommendation 1 - DOE recently negotiated a new contract with Fluor Hanford, Inc. (FHI) requiring the contractor to identify mission critical infrastructure facilities, equipment, and systems that are needed to support long-term cleanup. Maintenance requirements will then be applied depending on the needed lifetime and other circumstances. The new contract requires facilities, equipment, and systems that must be sustained through 2012 be kept in an adequate condition at the end of fiscal year (FY) 2006, at which time the current contract with FHI expires.

- Action: DOE will assure that contractor assigned infrastructure assets that are valued at greater than $25,000 are identified and will be required through FY 2012 to support the cleanup mission by March 31, 2003. DOE, with input from its contractor, will review the existing integrated priority list (IPL) to verify that any safety and health related projects are properly included by September 30, 2003. The contractor is responsible for prioritizing

infrastructure work critical for achieving mission objectives. DOE will perform a review of the contractor condition assessment system for infrastructure by November 1, 2003.

Recommendation 2 - DOE is not aware of any current deficiencies in infrastructure that are critical to safety and health. However, the contractor is responsible for maintaining employee safety and health. FHI's planning and work systems are expected to immediately address imminent safety and health issues. For active facilities, there are Voluntary Protection Programs (many of "Star status"), safety councils, a "stop work" process, and management focus on employee safety. For inactive facilities, access is restricted to specially qualified crews that are prepared for the hazards. It is recognized, however, that long-term problems may exist. As described above, we are currently in the process of identifying and categorizing key infrastructure facilities, equipment, and systems for accelerated cleanup. Maintenance needs will then be prioritized and used as a basis for funding decisions. The FHI contract also contains a "Conditional Payment of Fee Clause" that allows DOE to penalize FHI if appropriate priority is not given to ensure safety and health risks to Hanford employees. The IPL that contains safety and health related infrastructure projects will be reviewed.

Recommendation 3 - DOE agrees with the audit conclusions. Due to the accelerated closure of the Hanford Site and the limited useful life remaining on a number of facilities, development of a single comprehensive, integrated maintenance management system at this time would be very costly with minimal return on investment. Therefore, as part of implementing Best Business Practices, FHI is reviewing consolidation of management systems and maintenance cost accessibility for potential changes that improve business management.

- Action: DOE will review the status of the project maintenance center by September 30, 2003.

Recommendation 4 - RL will continue to work closely with EM to ensure that adequate funds are budgeted for facility maintenance and disposition consistent with RL's Risk Management Plan, RL's Lifecycle Plan, and as mandated by the FY 2003 Omnibus Appropriations Conference Report. FHI's renegotiated contract includes a Statement of Work that requires FHI to provide infrastructure facilities, equipment, and services to meet mission needs. Further, the revised contract includes an annual budget profile that is consistent with DOE-EM guidance and which the contractor accepted as adequate to complete the Statement of Work. RL will continue to submit budget requests based on the IPL as required by DOE Headquarters.

If you have any questions, please call me at (202) 586-7709, or Mr. Mark W. Frei, Acting Deputy Assistant Secretary, Office of Project Completion, at (202) 586-0370.

Jessie Hill Roberson
Assistant Secretary for
Environmental Management

Attachment

cc: M. R. Kuklok, IG-36

IG Report No. :OAS-B-03-03

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