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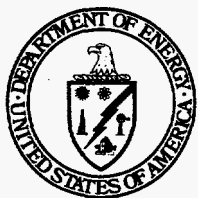
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## Department of Energy

Washington, DC 20585

June 24, 1997

### MEMORANDUM FOR THE SECRETARY

FROM:

John C. Layton  
Inspector General

A handwritten signature in cursive script that reads "John C. Layton".

SUBJECT: INFORMATION: "Audit of Shutdown and Transition of the Mound Plant"

### BACKGROUND:

The end of the Cold War has allowed the Department of Energy (Department) to reduce weapons production and consolidate operations throughout the nuclear weapons complex. As part of this consolidation, the Department has either transferred or is planning to transfer all weapons-related and production activities at the Mound Plant to other Departmental facilities. The objective of this audit was to determine if the shutdown and transition of the Mound Plant was progressing efficiently and effectively. More specifically, the audit was to determine if it was in the best interests of the Department and the Government to keep a portion of the Mound Plant open solely to support the assembling and testing of isotopic heat sources and radioisotope thermoelectric generators (HS/RTG).

### DISCUSSION:

The Nonnuclear Consolidation Plan envisioned consolidating all of the Department's nonnuclear activities at the Kansas City Plant and closing the Mound and Pinellas Plants. Although all weapons related work and production capabilities at the Mound Plant have either ceased or will cease in the near term, the Office of Nuclear Energy, Science and Technology (Nuclear Energy) plans to continue assembling and testing HS/RTGs at the Mound Plant. Nuclear Energy decided to continue its operations at the Mound Plant without adequately considering the Department's overall economic goals. As a result, the Department may incur \$4 million to \$8.5 million more than necessary each year to continue HS/RTG operations at the Mound Plant. Additionally, if the HS/RTG operations remain at the Mound Plant, the Department will spend at least \$3 million to move the operations into new facilities. Thus, we recommended that the Director, Nuclear Energy suspend the consolidation of HS/RTG activities at the Mound Plant and transfer the function to the alternate Departmental site which is most economically advantageous.

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cc: Deputy Secretary  
Under Secretary

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U.S. DEPARTMENT OF ENERGY  
OFFICE OF INSPECTOR GENERAL

AUDIT OF SHUTDOWN AND TRANSITION  
OF THE MOUND PLANT

Report Number: DOE/IG-0408  
Date of Issue: June 24, 1997

Eastern Regional Audit Office  
Oak Ridge, TN 37830

AUDIT OF SHUTDOWN AND TRANSITION  
OF THE MOUND PLANT

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U.S. DEPARTMENT OF ENERGY  
OFFICE OF INSPECTOR GENERAL  
OFFICE OF AUDIT SERVICES

AUDIT OF SHUTDOWN AND TRANSITION  
OF THE MOUND PLANT

Audit Report Number: DOE/IG-0408

SUMMARY

With the end of the Cold War, the Department of Energy (Department) has greatly reduced the production of nuclear weapons and redirected the capabilities and focus of the weapons complex. As part of this redirection, the Mound Plant was transferred from a Defense Program site to an Environmental Management site with emphasis on accelerated cleanup and transition of facilities and personal property to the local community. We initiated this audit to determine if the shutdown and transition of the Mound Plant was progressing effectively and efficiently.

The Department prepared a Nonnuclear Consolidation Plan (NCP) designed to reduce its costs of operation by closing and consolidating facilities. In contrast to the goal of the NCP, the Department plans to keep a portion of the Mound Plant open solely to perform work for other Federal agencies. Specifically, the Department has decided to continue assembling and testing isotopic heat sources and radioisotope thermoelectric generators (HS/RTG) at the Mound Plant despite the transfer or planned transfer of all other production operations. The Office of Nuclear Energy, Science and Technology decided to continue its HS/RTG operations at the Mound Plant without adequately considering the overall economic goals of the Department. As a result, the Department may not achieve the savings envisioned by the NCP. Also, the Department may incur between \$4 million and \$8.5 million more than necessary each year to continue its HS/RTG operations at the Mound Plant. Additionally, if the HS/RTG operations stay at the Mound Plant, the Department will spend more than \$3 million to consolidate these operations into one location.

Management did not respond formally to the official draft of this report despite an extended comment period. However, in response to an earlier draft, management neither concurred nor nonconcurred with the recommendations. Management stated that continuing HS/RTG work at the Mound Plant was a prudent decision supportable by economic, environmental, and safety data analyses. However, management recently committed to take a strategic look at the operations associated with the space and terrestrial power systems throughout the Department of Energy complex, including the Mound Plant.

*Office of Inspector General*  
Office of Inspector General



## PART I

### APPROACH AND OVERVIEW

#### INTRODUCTION

The end of the Cold War has allowed the Department of Energy (Department) to reduce weapons production and consolidate operations throughout the nuclear weapons complex. As part of this consolidation, the Department has either transferred or is planning to transfer all weapons related and production activities at the Mound Plant to other Departmental facilities. The new emphasis at the Mound site is accelerated cleanup and the transfer of facilities and property to the local community. The objective of this audit was to determine if the shutdown and transition of the Mound Plant was progressing efficiently and effectively. More specifically the audit was to determine if it was in the best interests of the Department and the Government to keep a portion of the Mound Plant open solely to support the HS/RTG operations.

#### SCOPE AND METHODOLOGY

The audit was performed at the Mound Plant in Miamisburg, Ohio, from August 27, 1996, through February 19, 1997. To accomplish the audit objective, we:

- Reviewed the Department's Nonnuclear Consolidation Plan;
- Reviewed Departmental assessments of the Isotope Power Systems Program;
- Held discussions with personnel from the Ohio Field Office, Miamisburg Area Office, Departmental Headquarters and Los Alamos National Laboratory regarding plans for assembling and testing HS/RTG.
- Examined documentation detailing the Department's plans for the HS/RTG operations; and
- Evaluated the Department's decision to keep HS/RTG assembly and test operations at the Mound Plant.

The audit was performed 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 Departmental controls over HS/RTG assembly and testing operations at the Mound Plant. 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 did not conduct a reliability assessment of computer-processed data because only a very limited amount of computer-processed data was used during the audit.

The audit disclosed a material internal control weakness that management should consider when preparing its yearend assurance memorandum on internal controls. Management did not respond to the official draft report that was due to us by June 13, 1997. Consequently, we are incorporating management's response to the initial draft of the report.

#### PRIOR AUDIT REPORTS

The Office of Inspector General has issued several reports dealing with the restructuring of the nuclear weapons complex and its affects on the Mound Plant. In report DOE/IG-0328, *Audit of Mound Plant's Reduction in Force*, we concluded that the lack of Departmental guidelines contributed to excessive costs for the Mound Plant's FY 1992 reduction in force and the approval of inconsistent employee benefits among Departmental sites. In report ER-B-94-03, *Audit of Production Decline and Nonnuclear Consolidation at the Mound Plant*, we determined that EG&G Mound Applied Technologies, Inc., did not reduce staffing commensurate with workload, and did not delay or cancel capital projects in response to the NCP. In report DOE/IG-0360, *Audit of the Transfer of Government-Owned Property at the Mound and Pinellas Plants*, we determined that the Department planned to transfer or otherwise make available to economic development initiatives personal property that had Defense Program requirements or had not been properly screened for other needs. In report ER-L-97-02, *Audit of the Department of Energy's Economic Development Activities at the Pinellas, Mound, and Rocky Flats Plants*, we concluded that the Department's new draft guidance, along with actions taken in response to prior audits, should enable the Department to achieve its long-term economic development goals. In report ER-B-97-02, *Audit of the Department of Energy's Grant for Economic Development at the Mound Plant*, we determined that, contrary to Federal regulations, the Department advanced the City of Miamisburg, Ohio, \$2.6 million more than the minimum funds needed to meet immediate cash requirements, and most of the funds were maintained in non-interest-bearing accounts.

## BACKGROUND

The Mound Plant, located in Miamisburg, Ohio, traditionally has been a Department-owned, contractor-operated facility, operated in support of nuclear weapon production and research and development. Currently, there are only two ongoing production operations at the Mound Plant--the Tritium Weapons Program and the Isotope Power Systems Program. The Tritium Weapons Program is expected to be completed by March 1998. However, the Department has decided to continue the Isotope Power Systems Program at the Mound Plant into the foreseeable future.

The Isotope Power Systems Program involves the production of HS/RTGs for the National Aeronautic and Space Administration (NASA) and the Department of Defense (DOD). Under the Atomic Energy Act of 1954, as amended, the Department has the authority and responsibility to develop and produce such systems for user agencies and to assure the safety of these radioactive materials and the devices that utilize them. Other Departmental facilities involved in the production of isotopic heat sources and RTGs include the Los Alamos National Laboratory, Oak Ridge National Laboratory and the Savannah River Site. The Department's Office of Nuclear Energy, Science and Technology is responsible for this program.

Total expenditures for the HS/RTG operation were about \$60 million for FY 1996. The Department funded \$49.3 million while NASA and DOD contributed \$9.3 million and \$2.3 million, respectively, to the program. Total HS/RTG expenditures at the Mound Plant were \$14.2 million in FY 1996. The majority of expenditures at the Mound Plant in FY 1996 were for NASA's Cassini Space Mission. The Mound Plant's support for the Cassini Space Mission is expected to be completed in mid-FY 1997.

Although future HS/RTG requirements at the Mound Plant have not yet been funded, several DOD and NASA projects have been planned. The next mission at the Mound Plant is expected to be the DOD 50-watt project for which the Mound Plant will assemble and test 15 RTGs. This project has not yet been officially approved. However, the Mound Plant is expected to get involved in preliminary design and fabrication during FY 1998. The project is tentatively scheduled for completion in March 2006. The next NASA project is the Pluto Express Mission. If this mission is funded, the Mound Plant will probably get involved around October 1999. In addition to these missions, DOD high-performance generators are periodically sent to the Mound Plant for disassembling, refurbishing, and assembling. One of these generators is expected to be reassembled at the Mound Plant in the second half of FY 1998.

## PART II

### FINDING AND RECOMMENDATIONS

#### Continued Operation of the Heat Source/RTG at the Mound Plant

##### FINDING

The goal of the Department's Nonnuclear Consolidation Plan (NCP) was to reduce costs by closing one or more of its nonnuclear facilities. Specifically, the plan envisioned consolidating all nonnuclear weapons activities at the Kansas City Plant and closing the Mound and Pinellas Plants. Although all weapons related work and production capabilities at the Mound Plant have either ceased or will cease in the near term, the Office of Nuclear Energy, Science and Technology (Nuclear Energy) plans to continue assembling and testing isotopic heat sources and RTGs at the Mound Plant. Nuclear Energy decided to continue its operations at the Mound Plant without adequately considering the Department's overall economic goals. As a result, the Department may not achieve the savings envisioned in the NCP. Also, the Department may incur \$4 million to \$8.5 million more than necessary each year to continue its HS/RTG operations at the Mound Plant. Additionally, if the HS/RTG operations remain at the Mound Plant, the Department will spend at least \$3 million to move the operations into new facilities.

##### RECOMMENDATIONS

We recommend that the Director, Office of Nuclear Energy, Science and Technology:

1. Suspend the consolidation of HS/RTG activities at the Mound Plant.
2. Transfer the HS/RTG function to the alternate site in the Department complex which is most economically advantageous.

##### MANAGEMENT REACTION

Management did not provide a formal response to the official draft of this report despite an extended comment period. However, in response to an earlier draft, management neither concurred nor nonconcurred with the audit recommendations. The Director, Office of Nuclear Energy, Science and Technology stated that it was a prudent decision to continue the HS/RTG work at the Mound Plant and that the decision was supportable by economic, environmental, and safety data analyses. However, management stated that it recently committed to take a strategic look at the operations associated with

the space and terrestrial power systems throughout the Department, including the Mound Plant. Management's comments are summarized and addressed in Part III of this report.

## DETAILS OF FINDING

### CONSOLIDATION OF NONNUCLEAR FACILITIES

The primary goal of the Department's nonnuclear consolidation was to reduce costs by closing facilities. In September 1991, the Department concluded that the Kansas City Plant was the preferred alternative for consolidation of the nonnuclear complex; and, as a result, all Defense Program operations at the Mound Plant were scheduled to be transferred. The NCP acknowledged that some "work-for-others," such as HS/RTG assembly and testing, was performed at the Mound Plant. However, the NCP stated that it would be unreasonable to keep a plant funded by Defense Programs open just to benefit non-Defense Program customers. The NCP further stated that a plant would be forced to remain open if only some, but not all, activities were transferred out of the plant. In that case, the Department would not realize anticipated cost savings because plant overhead would still be incurred.

### MOUND HS/RTG OPERATIONS

Despite the fact that all other weapons related work and production capabilities at the Mound Plant have either ceased or will cease in the near term, the Department has decided that assembly and testing of HS/RTGs will continue into the foreseeable future at the plant. Additionally, the Department plans to make a significant capital investment in the HS/RTG operation at the plant.

In October 1993, the General Accounting Office (GAO) issued a report GAO/RCED-94-6, *NUCLEAR SCIENCE -- More Planning Needed to Support Future Needs for Electric Power in Space*. The report recommended that the Department examine the alternatives for long-term supply of RTGs in view of the downsizing and closure of many of the facilities where the fuel and components have been historically produced. The GAO was particularly concerned that the HS/RTG assembly and testing operations at the Mound Plant could eventually be the only activity left at the site, and it would be solely responsible for paying the site's overhead costs. However, in October 1994, the Department conducted an assessment in which it concluded that the heat source and RTG assembly and testing operations should continue into the foreseeable future at the Mound Plant.

The Department plans to make a significant capital investment at the Mound Plant to consolidate the HS/RTG operations into six buildings on the south hill of the facility. The Mound Plant contractor expects to begin the consolidation in FY 1999. The operation is currently in 12 buildings. However, its primary activities take place in two

buildings. The contractor submitted a proposal to consolidate activities in the two primary buildings into one building at a cost to the Department of about \$3 million. The cost of the complete consolidation had not been determined at the time of our review.

### INCOMPLETE ANALYSIS

Nuclear Energy based the decision to keep HS/RTG operations at the Mound Plant primarily on meeting NASA and DOD requirements without adequately considering the long-term economic goals of the Department. Nuclear Energy stated that the decision to keep HS/RTG assembly and testing operations at the Mound Plant was made as a result of an internal review of the program conducted in 1994. The primary purpose of Nuclear Energy's internal review was to determine whether the Department could continue to supply NASA and DOD with isotopic heat sources and RTGs. The report addressed the question of whether or not the changing mission of the Mound Plant could adversely impact the Department's ability to meet customer requirements. Although the reviewers concluded that from a technical capabilities perspective, HS/RTG assembly and testing operations should remain at the Mound Plant, senior Nuclear Energy managers told us that the technical capabilities could be developed and performed at an alternate Department site.

Nuclear Energy's internal review did not fully address the anticipated savings that would be associated with the complete shutdown of the Mound Plant and movement of the HS/RTG operations to another facility. Specifically, adequate consideration was not given to: (1) preliminary cost information obtained from alternate sites, (2) potential savings attributable to reduced shipping costs, (3) downtimes during non-build years, or (4) support services costs at the Mound Plant. Without a full and thorough consideration of these factors, we concluded that the Department's decision makers did not have all the data needed to make informed judgments on the most effective location for future HS/RTG operations.

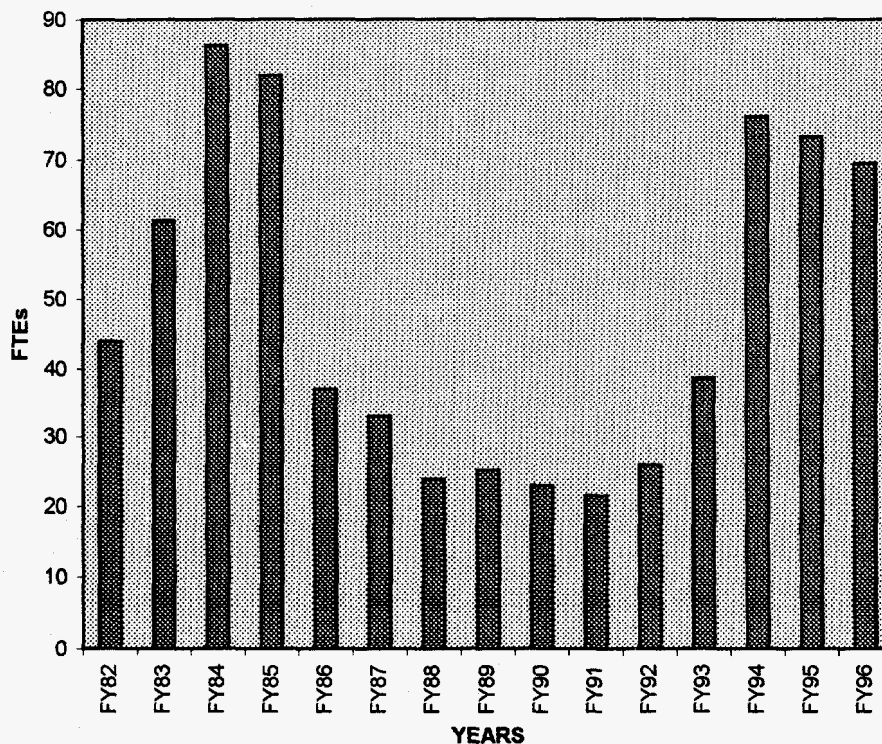
Preliminary Cost Information. Nuclear Energy obtained preliminary information showing that the annual operating costs of the HS/RTG operations at the Mound Plant might be substantially reduced if the operations were moved to an existing alternate site in the Department complex. At Nuclear Energy's request, responsible officials at the Los Alamos National Laboratory (LANL), a site candidate, developed estimated operating costs that would be incurred by LANL if the Mound Plant function was transferred to them. Based on LANL's information, and data provided by the Mound Plant, we estimated that the Department could save \$4 million to \$8.5 million in annual operating costs, depending on the level of activity, by transferring the operations from the Mound Plant to LANL. Although Nuclear Energy agreed that operating costs might be reduced by performing the operations at another site, they felt that LANL's site cost estimates were understated. However, they could not provide any analytical basis or documentation for this conclusion. Nuclear Energy managers also argued that the Department could incur as much as \$40 million in initial costs to relocate the HS/RTG operation. They

indicated that these funds were not available in their budget. However, the Department did not prepare a formal cost estimate nor estimate how long it would take to recover these costs. While we recognize the difficulties of obtaining major budget commitments in the current environment, the lack of formal cost estimates would have undermined any request for such funds.

Shipping Costs. Nuclear Energy did not determine the amount of shipping costs that could be saved if the operations were moved to an alternate site. Nuclear components are currently shipped to the Mound Plant for assembly in RTGs. However, the Department would not have to ship these components to LANL, the prime alternate site identified in Nuclear Energy's 1994 internal review. Nuclear Energy did not determine the annual cost of shipping the nuclear components to the Mound Plant because it did not consider the amount to be significant. However, the Albuquerque Operations Office estimated that, during FYs 1995 and 1996, the cost of shipping these components to the Mound Plant were \$390,000 and \$845,000, respectively.

Employee Downtime. Nuclear Energy did not consider the fact that leaving the RTG operations at the Mound Plant would eventually result in unnecessary downtime for employees working on the program. Since FY 1982, the number of full-time-equivalent employees charged to the Mound Plant's HS/RTG operations fluctuated significantly from year to year. This is shown in the following graph.

**HS/RTG MOUND WORKLOAD**



The workload fluctuations were dictated by the requirements of other agency projects. For example, NASA's Galileo/Ulysses Missions and the more recent Cassini Space Mission caused significant increases in the workload at the Mound Plant during FYs 1983 through 1985 and FYs 1994 through 1996. During the low production years between the big NASA projects, the Mound Plant's HS/RTG employees downtime was redirected to work on other production operations at the Mound Plant. However, all other production operations have been, or soon will be, discontinued at the Mound Plant. As a result, HS/RTG employees will no longer be able to work on other projects during their downtime. Thus, during non-build years, the Department will incur the costs of maintaining this capability without any funding from NASA and DOD. In our view, the fluctuations in historical workload and the need to keep employees productive through the availability of other assignments, supports an argument that the HS/RTG operation be located at an active facility.

*Support Service Costs.* Nuclear Energy did not give adequate consideration to the fact that the HS/RTG program at the Mound Plant could ultimately be responsible for absorbing all support services costs. The transfer of production activities and the clean-up of the Mound Plant could result in a substantial increase in the HS/RTG program's overhead and landlord costs. During FY 1993, the Mound Plant contractor estimated that if the HS/RTG operations were handled as a stand-alone operation, the incremental increase in overhead and landlord costs to the program would be about \$3.4 million during a build-year. No support service costs were projected for a non-build year; however, it would stand to reason that costs would still be high. According to the estimate, the program would be responsible for supporting 105 FTEs for indirect support and overhead. The 105 FTEs would include, for example, 40 administrative personnel, 19 engineers, and 10 firemen. Thus, the Department would be required to maintain a costly infrastructure to support a stand alone production facility. This appears to be contrary to the Department's goal of reducing indirect infrastructure costs throughout the complex.

#### ACHIEVING ECONOMIC GOALS

Nuclear Energy's plans to continue the HS/RTG operations at the Mound Plant do not give adequate consideration to the long term savings that could be achieved by moving the activity to another Department site. As a result of continuing HS/RTG operations at the Mound Plant, The Department may not achieve the savings envisioned in the NCP, and may incur \$4 million to \$8.5 million more than necessary each year to assemble and test isotopic heat sources and RTGs. Moreover, significant amounts of money will be expended for shipping nuclear components to the site; employee downtime that will be incurred during low productive years; and in increased support service costs. Decommissioning activities currently taking place at the site will necessitate additional costs for consolidating operations from 12 to 6 buildings. As previously stated, Nuclear Energy has received a \$3 million estimate to consolidate two of the primary buildings into one. Although we were advised that this should be the bulk of the consolidation costs, an



estimate of the funds that would be needed to complete the entire consolidation had not been developed at the time of our review.

### PART III

#### MANAGEMENT AND AUDITOR COMMENTS

The Director, Office of Nuclear Energy, Science and Technology (Nuclear Energy) did not respond to the official draft of this report. However, in response to an earlier draft, management neither concurred nor nonconcurred with our recommendations. A summary of the comments and our replies follows.

Management Comments. Overall, management felt that the decision to continue assembling and testing isotopic heat sources and radioisotope thermoelectric generators (HS/RTG) at the Mound Plant was a prudent decision supportable by economic, environmental, and safety data analyses conducted in three separate reviews. Also, management stated that the cost savings of \$4 million to \$8.5 million presented in the report were overstated. Further, management stated that the report did not give adequate consideration to estimated costs of up to \$40 million to relocate the operation and the associated technologies.

Auditor Comments. During the audit, we considered the three reviews referenced by management. We found no economic analyses in the reviews to support management's decision to continue HS/RTG operations at the Mound Plant. In fact, during the audit, management told us that no detailed economic analysis was ever performed because the up-front costs of transferring the operation to another site were considered prohibitive. Further, we found no evidence in the reviews that transferring the operations to another site posed any significant environmental or safety hazards. Finally, we do not feel that the estimated cost savings identified in the report are overstated. Our estimate of annual savings associated with transferring the operation to another Departmental site was based on information gathered by Nuclear Energy management during their reviews of the program. These annual savings would be used to offset the relocation costs.

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