

DOCUMENT RESUME

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[Safety of Plutonium-238 Activities at Mound Laboratory].
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Report to Robert W. Fri, Acting Administrator, Energy Research and Development Administration; by Monte Canfield, Jr., Director, Energy and Minerals Div.

Issue Area: Energy: Energy Research and Development (1605).
Contact: Energy and Minerals Div.
Budget Function: Natural Resources, Environment, and Energy: Energy (305).
Organization Concerned: Energy Research and Development Administration; Mound Lab., OH.
Congressional Relevance: House Committee on Science and Technology; Senate Committee on Energy and Natural Resources.
Authority: Energy Reorganization Act of 1974 (P.L. 93-438). Atomic Energy Act of 1954.

The situation at the plutonium processing building at Mound Laboratory near Dayton, Ohio, has potentially serious safety implications. The building was constructed in 1967 to process plutonium-238 to be used in nuclear generators for the space program. Findings/Conclusions: Previous studies have cited radiological hazards at the Mound Laboratory operation. Despite safety concerns, plutonium-238 operations were expanded. In 1975, the Energy Development and Research Administration (ERDA) had an opportunity to produce a nuclear component at another facility, but determined that it would be more economical to continue production at Mound. ERDA's Division of Military Application recently determined that its program at Mound involving plutonium-238 operations would be completed in 1979, rather than 1981 as scheduled, and that no programs beyond the present military program would be located in the plutonium processing building. Recommendations: Before determining whether it is reasonable to halt plutonium-238 operations, the Administrator of ERDA should determine whether the mission goals of ERDA's military programs override the safety concerns associated with the continued operation of the building. He should also determine whether responsible officials have kept the Congress fully and currently informed of the situation at Mound. (RRS)



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

ENERGY AND MINERALS
DIVISION

B-131115

JUN 29 1977

The Honorable Robert W. Fri
Acting Administrator,
Energy Research and Development
Administration

Dear Mr. Fri:

Continuing the safe operation of the Energy Research and Development Administration's (ERDA's) nuclear installations is of the highest importance to you and to our Office. Consequently, we are bringing a situation to your attention concerning the Mound Laboratory near Dayton, Ohio. It has potentially serious safety implications.

Our concern is focused on the plutonium processing building at Mound Laboratory. The building was built in December 1967 to process plutonium-238--a dangerous radioactive material--to be used in nuclear generators for the Nation's space program.

A HISTORY OF SAFETY CONCERNS

On August 2, 1971, the General Manager, Atomic Energy Commission, 1/ notified the congressional Joint Committee on Atomic Energy of a March 19, 1971, Commission decision to remove all plutonium-238 operations, except primary encapsulation of plutonium-238 fuel forms, from Mound Laboratory to its Savannah River, South Carolina, reservation. The basis for this decision was a Commission staff study of the potential radiological hazards of all Mound Laboratory activities, which concluded that

1/The Atomic Energy Commission was abolished on January 19, 1975. The activities discussed in this report were transferred to ERDA as a result of the Energy Reorganization Act of 1974 (Public Law 93-438).

02456

295

"The greatest potential radiological hazards in the Mound operation are in the plutonium-238 fuel form preparation and recovery activities. Widespread release of radioactivity at Mound appears very unlikely, but an incident can be postulated which could have serious consequences in a densely populated area. The staff has therefore concluded that initially the plutonium-238 fuel form preparation and recovery activities should be relocated, and the initial necessary funding required for this relocation be included in the FY 1973 budget." 1/

The study recommended that funds be used in fiscal year 1972 for conceptual studies and design work to insure the relocation at the earliest practicable date, then targeted for fiscal year 1976.

In 1972, the Congress authorized \$8 million to build the proposed Savannah River plutonium fuel form fabrication facility 2/. In requesting funding for this project, the Atomic Energy Commission told the Joint Committee on Atomic Energy that the plutonium-238 activities "* * * pose the greatest potential radiological hazards in the overall Mound operation. Although the release of radioactivity appears very unlikely, such a release is nevertheless possible."

In 1973, the Commission reaffirmed its decision to move plutonium-238 operations from Mound Laboratory to Savannah River, and also decided that additional operations, namely the primary encapsulation of plutonium-238 fuel forms, should be moved. The Commission believed that such a transfer would enhance safety and further reduce the risks associated with the plutonium-238 fuel production operation.

A January 15, 1975, report prepared by Monsanto Research Corporation (the firm that operates Mound Laboratory for ERDA) further emphasized the safety problems at Mound Laboratory. It documented a detailed evaluation of operational safety at

1/There were approximately 2.5 million people in the Mound area at the time of this report.

2/Construction on this facility is nearly complete. Initial operations are scheduled to begin in April 1978.

the plutonium processing building and identified a number of problems which indicated a need to upgrade the building. Foremost among these are the building's failure to meet current Federal earthquake and tornado design criteria. Specifically, the report stated

"The building was not designed to survive Design Basic Earthquake or a direct strike by the AEC Model Tornado. The probability of occurrence of these extreme phenomena is extremely small; if they were to occur, the consequences would be very serious. The building can be upgraded to assure the protection of the employees, the public, and the environment even during these extreme tornado and earthquake conditions."

An ERDA official told us that Monsanto Research Corporation had proposed in 1975 that ERDA upgrade the building to assure the protection of the public during extreme tornado and earthquake conditions. The proposal was rejected because the cost of this upgrading was not acceptable and plans called for the plutonium-238 operation to be moved. Since then ERDA has not taken any actions to increase the structural resistance of the facility to meet ERDA's design criteria for natural phenomena.

DESPITE SAFETY CONCERNS PLUTONIUM-238
OPERATIONS AT MOUND LABORATORY
WERE EXPANDED

When the Atomic Energy Commission decided in 1971 and 1973 to transfer all plutonium-238 activities from the Mound plutonium processing building, the major activity at the building related to the Commission's space nuclear program. Once in operation, the Savannah River facility will handle the most hazardous plutonium-238 space operations--fuel form preparation and primary encapsulation. According to ERDA officials, these operations have ceased at Mound and plans call for decontamination activities to begin in fiscal year 1978.

However, in May 1974, after work on the Savannah River facility had begun, the Commission's Assistant General Manager for Military Applications decided that Mound Laboratory was the only reasonable place to produce another plutonium-238 product needed for a nuclear weapons program. A March 15, 1977, letter

from the Manager of ERDA's Albuquerque Operations Office indicates that production of this weapon system component was scheduled to be completed at the end of fiscal year 1981.

In 1975, ERDA had an opportunity to produce this component at Savannah River, but did not do so. As a result of a delay in the military program, ERDA considered the feasibility of relocating the equipment needed for the component from Mound Laboratory to Savannah River while still meeting the revised schedule. This would have cost \$3 million. Rather than spend this additional amount, ERDA decided that retaining production at Mound was the only reasonable course of action. The Savannah River facility does not now have the capability to support the military program.

At the time of our review, no firm military requirements existed for programs to follow the present program at Mound. However, a May 18, 1977, letter from the Assistant Administrator for National Security to the Assistant Administrator for Environment and Safety stated that ERDA had identified three future weapon systems, which if produced, could keep the building in use through fiscal year 1985--14 years after the initial decision to remove plutonium-238 operations.

RECENT AGENCY ACTIONS

On May 31, 1977, we submitted a draft of this report to ERDA and on June 8, 1977, we met with ERDA officials. They told us the Division of Military Application had recently determined that

- its military program at Mound involving plutonium-238 operations would be completed in 1979 rather than in 1981, as previously scheduled, and
- no programs beyond the present military program would be located in the plutonium processing building at Mound.

At the time of our meeting, these officials could not document the basis for these decisions. On June 13, 1977, the Director, Division of Military Application, instructed in a letter to the Manager, Albuquerque Operations Office, that these decisions be carried out.

CONCLUSIONS AND RECOMMENDATIONS

We believe the recent actions by the Division of Military Application to accelerate the military program schedule and not to use the plutonium processing building after that program is complete is a step towards meeting the original Commission decisions to enhance safety. However, it may not be enough.

In light of the safety concerns of continued plutonium-238 operation at the plutonium processing building expressed by the 1971 and 1973 Commission decisions, the operating contractor's 1975 safety evaluation, the fact that nothing has been done to upgrade the building to meet tornado and earthquake standards, and the recent agency actions that apparently recognize the safety implications of continued operation, we believe you should take immediate actions.

We recommend that you determine whether the mission goals of ERDA's military programs override the safety concerns associated with continued operation of the building. We believe it is reasonable to halt plutonium-238 operations at the building until you make this determination. You should carefully review whether program schedules can be adjusted or other measures can be taken to eliminate any potential radiological hazard to the public near Mound.

We also recommend that you determine whether responsible officials kept the Congress fully and currently informed, as required by the Atomic Energy Act of 1954, as amended, of actions highlighted in this report that may have been contrary to previous correspondence to the Congress and ERDA's requests for budget authorization for the Savannah River facility.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairmen, House and Senate Committees on Appropriations; the Chairmen, House Committee on Government Operations and Senate Committee on Governmental Affairs; the Chairmen, House and Senate Committee on Armed Services; the Chairman of the House Committee on Science and Technology; and the Chairman, Senate Committee on Energy and Natural Resources; and the Chairman, Joint Committee on Atomic Energy.

Section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee

on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We appreciate the courtesy and cooperation extended to our staff during this review and would appreciate being informed of the actions you take on our recommendations.

Sincerely yours,



Monte Canfield, Jr.
Director