

**Department of Energy**

Washington, DC 20585

13 August 1997

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The Honorable John T. Conway  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, N.W.  
Suite 700  
Washington, D.C. 20004

Dear Mr. Chairman:

Enclosed is the Department's third quarterly status report of progress in implementing your Recommendation 94-3. The recommendation addresses the seismic safety of the plutonium storage building (Building 371) at Rocky Flats. This report is provided as committed in the Department's Integrated Program Plan for the recommendation. It is responsive to the concerns you related in your letter dated May 16, 1997, which addressed need to assure timely progress in upgrading this important facility.

Progress is reported toward completion of priority safety upgrades in Building 371, completion of a revised safety basis for Building 371, and completion of a conceptual design for a new plutonium storage facility concept. Progress continues to adhere to schedules provided in last quarter's report, reflecting improved project management and oversight.

Sincerely,

Handwritten signature of James M. O'Connell.

*for*  
Alvin L. Alm  
Assistant Secretary for  
Environmental Management

Enclosure

cc: M. Whitaker, S-3.1



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**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD  
RECOMMENDATION 94-3**

**THIRD QUARTERLY REPORT  
REVISION 1**

Classified By: L. K. Kurek (U/NOU)

Date: 31 July, 1997

**July 1997**

## EXECUTIVE SUMMARY

This periodic report provides an update on progress with implementation of the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-3. Recommendation 94-3 involves seismic and safety upgrades to the Rocky Flats plutonium storage facility. The Department of Energy prepared and transmitted to the DNFSB an Integrated Program Plan (IPP) which made several commitments for future actions and decisions. Progress on those actions and results of decisions are reported in this third quarterly report.

Revision 1 of the Building 371 Basis for Interim Operations (BIO) was completed and delivered to DOE-RFFO on June 16, 1997, as planned. To resolve the DOE Review Team crosstable comments, additional accident scenarios, supporting calculations and significant text revisions were incorporated, particularly those with a potential to impact the safety basis and safety control set. The revised BIO provides an assessment of the hazards associated with the facility mission, defines the risk, establishes controls to support safe, efficient operations, and provides a basis for the consistent application of the Unreviewed Safety Question (USQ) process. It is, therefore, a suitable technical basis for completion of the System Evaluation Reports (SERs) and the BIO Implementation Plan (IP), and to determine the need for any additional 94-3 IPP-related facility upgrades.

DOE, RFFO completed a review of Revision 1 of the BIO during preparation of their review report. Limited revisions to the BIO have been defined to resolve those comments affecting the Authorization Agreement. These changes, and any others identified during SER and IP finalization which are safety significant, will be incorporated in early September to support the Authorization Agreement schedule.

The SERs were completed July 18, 1997. These system design documents will play a key role in BIO implementation as they provide clarity of system safety functions, of safety equipment boundaries, of system interfaces including required support systems, and of required actions to ensure and maintain the BIO safety functions.

The IP is more than 70% complete and remains on schedule for completion by September 10, 1997. As part of implementation planning, a summary matrix comparing existing and new requirements in the context of current practice was developed. Two new compensatory measures were identified for implementation in July to ensure safe facility operation pending BIO implementation.

Progress continues in completing the designated Building 371 upgrades. Design is complete and work packages are being developed on most of the remaining projects requiring field work. Field work is underway on two lead projects and near initiation on two more. Substantial progress has been made in integrating upgrade project activities to ensure a system engineering focus on real safety improvements. K-H is striving to complete the priority upgrades this year as committed in the IPP. Other BIO-required upgrades have been tentatively identified and a plan to complete them will be finalized in August.

DOE's decision on possible deferral of initiation of Safety Margin Upgrades (either begin in FY98 or defer to FY99) remains on schedule for September of 1997. The basis for that decision will be evidence of continuing progress toward early off-site shipment of Site Special Nuclear Material (SNM).

The conceptual design report for the Interim Storage Vault was completed and transmitted to DOE, RFFO on July 18, 1997.

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## 1.0 PROGRAM ORGANIZATION

This section corresponds to section one of the IPP. It addresses key changes to the organization identified in that section as modified in subsequent quarterly reports. There have been no changes to the organization presented in the second quarterly report.

## 2.0 BUILDING 371

This section corresponds with Section 3 of the IPP that focuses on "Goal 1: Establish safe operation of Building 371 in conformance with an updated Authorization Basis (AB)." The following Goal 1 Objectives are specifically addressed: "Provide an updated Building 371 AB, complete definition and implementation of necessary upgrades in Building 371, and establish building operations in conformance with the updated AB."

### 2.1 Accomplishments and Status Summary

#### 2.1.1 Building 371 Authorization Basis (AB)

The Rocky Flats Environmental Technology Site (Site) continued to make progress toward the achievement of milestone 3-3, Establish and document operation of Building 371 in conformance with an updated AB by December 1996. Revision 1 of the Basis for Interim Operations (BIO) for Building 371 was submitted as scheduled to the Department of Energy (DOE) on June 16, 1997. To resolve the DOE Review Team comments, additional accident scenarios, supporting calculations and significant text revisions were incorporated, particularly those with a potential to impact the safety basis and safety control set. The revised BIO provides an assessment of the hazards associated with the facility mission, defines the risk, establishes controls to support safe, efficient operations, and provides a basis for the consistent application of the Unreviewed Safety Question (USQ) process. It is, therefore, a suitable technical basis for completion of the System Evaluation Reports (SERs) and the BIO Implementation Plan (IP), and to determine the need for any additional 94-3 IPP-related facility upgrades. Further, the BIO, as completed, does not utilize the added conservatism that was anticipated in the IPP to accelerate its completion. Thus, this BIO is judged to be a near-final document suitable for ensuring Integrated Safety Management for the current facility mission (i.e. SNM storage through no later than 2002).

DOE, RFFO has conducted a final review of the completed BIO during preparation of their review report. On July 10, DOE-RFFO provided a total of fifty-three comments on Revision 1 of the BIO. Twenty were judged by RFFO to have potential significance for the Authorization Agreement. Discussions between RFFO and the BIO preparation team have defined appropriate changes to resolve these twenty comments. Agreed upon changes will be combined with the comparably limited changes arising from SER and Implementation Plan completion into a final BIO update in early September that will support the Authorization Agreement schedule (September 10).

One specific technical issue related to fire scenario modeling was not resolved at the time of submittal of Revision 1 to the BIO. The issue involved the capability of certain fire models to support definitive conclusions about flashover potential. The model developers were engaged to perform a definitive analysis that would provide a basis for resolving the issue. These analyses were completed and documented in draft form by July 14. The analyses determined that flashover will not occur for

nominal conditions in the analyzed drum storage room, a result that is judged to validate the safety position taken in the BIO. Based on the analysis, the annual update to the Fire Hazards Analysis (FHA) for Building 371, which was initiated in mid-July, will develop combustible control program parameters sufficient to ensure consistency with the BIO safety analyses.

SER development was completed on schedule, July 16, 1997. The January SERs were revised both to incorporate comments from cross-table review and to include new functionality criteria for all of the second tier safety systems (i.e. those designated "SC-3" at Rocky Flats). The resulting documents will play a key role in BIO implementation as they provide clarity of system safety functions, of safety equipment boundaries, of system interfaces including required support systems, and of required actions to ensure and maintain the BIO safety functions.

Development of the BIO Implementation Plan is on schedule for completion by September 10, 1997. Over 70% of the planned modules have been developed and reviewed by Kaiser-Hill, as has the implementation strategy. The modules address specific BIO commitments to Safety Management Programs, to new Technical Safety Requirements, or to new SERs. Support from Building 371 management in completing the BIO and developing the IP has been consistently strong. The Facility Manager remains committed to achieving the sound safety basis established by the BIO, and achieving the building safety upgrades intended by the Recommendation 94-3 IPP.

During BIO development there has been a continued effort to identify existing building conditions that might conflict with, or not meet the evolving standards of the new BIO. A systematic evaluation for "gaps" was initiated in conjunction with the IP development process to ensure current facility safety. A draft summary matrix comparing existing and new requirements in the context of current practice was developed and provided to the visiting DNFSB Staff members in early July. A revised matrix, with Building 371 comments incorporated, is now complete. Based on the results, compensatory measures will be instituted by the end of July to implement control of acetylene and require that drums containing over 1200 g of plutonium be attended on the dock.

#### 2.1.2 Building 371 Priority Safety Upgrades

Progress continues in completing the designated Building 371 upgrades. Design is complete and work packages are being developed on the remaining projects requiring field work. Field work began on lead projects in early July. Both fire door repair/replacement and attic piping seismic support installations are underway. Field work for egress upgrades is set to begin later in July.

Progress has been made in resolving the issues identified in the March assessment of the Building 371 Upgrade Project conducted by DOE, RFFO. A recovery plan was submitted to DOE, RFFO describing the strategy for closing each major issue and committing to institutionalize the lessons learned; an enclosed tracking matrix addressed each specific issue. Technical issues (including those from the RFFO Assessment, the FHA, the BIO completion, and the 94-3 low-cost systems) that affect design for current projects are being resolved as the projects proceed, while the remaining issues are being addressed in planning for the additional BIO-identified upgrade projects. In either case, an integrated systems engineering approach is now being applied to safety upgrades.

The following initiatives have been taken to improve project integration:

- Frequent meetings (daily when rapid changes are taking place) are held among 94-3 Program team members to ensure coordination of BIO, SER and IP developments with the upgrade projects and technical issue resolutions.
- Weekly upgrade project meetings are held with the design/build contractor, the RFFO technical lead, the Building 371 technical representative, upgrade project management, and 94-3 Program management to review the detailed status of each upgrade project. These meetings serve to identify and resolve issues in a manner that both ensures the intended safety improvement will be realized and expedites construction.
- Weekly 94-3 Program status meetings afford an opportunity for broader RFFO involvement in a problem-solving schedule-oriented context.
- The project data base is being continually refined as a tool to ensure integrated issue resolution; the specific project design packages are being improved both to communicate the safety objective of each upgrade and to document the technical design basis with reference to appropriate codes and standards.
- To ensure proper project scope prior to fieldwork initiation, RFFO is performing an independent review of each work package.

Overall, the new single point of responsibility organization has substantially improved communication focused on timely fulfillment of program objectives.

To test the effectiveness of actions taken to date, Kaiser-Hill sponsored a self-assessment of project activities in mid-July, involving Fred Loceff from Savannah River and others familiar with 94-3 objectives. Preliminary results indicate that project management and integration were found to be both effective and significantly improved from the condition addressed in the earlier RFFO assessment. Specific comments constructively indicate where further improvements can be made. A formal report is being prepared.

One of the two non-safety priority upgrade projects in IPP Table 3-1, the Material Transfer Dumbwaiter, was deferred by K-H for possible reconsideration with the other material relocation upgrades in IPP Appendix C. This upgrade was based on operational cost savings that cannot be realized now, given ongoing material transfers to the Pantex Plant, unless a future decision is made to store SNM in the sub-basement.

Kaiser-Hill prepared and issued to RFFO on July 18 a list of BIO-driven additional upgrades for Building 371. Engineering work is already underway on the assessment of vault storage rack seismic capacities and battery-powered emergency lighting. The list is supporting completion of the IP and planning for FY-98 budgets. With possibly some revision based on review comments, it will provide the basis for completing IPP milestone 3-4.

### 2.1.3 Building 371 Safety-Margin Upgrades Initiation

The practicality and need for additional Building 371 upgrades depends on the length of the storage mission (duration) and the facility hazards during that period. Decisions on additional upgrades were identified in the IPP to depend upon progress toward a new Site plutonium storage facility, the Interim Storage Vault (ISV). Since off-site shipment of material to the Pantex Plant and the SRS is now the DOE's

preferred option for Site material, these decisions are now dependent on progress toward these off-site shipments. The decision point on deferral in the IPP is specified as September 1997, reflecting a judgment that the safety margin upgrades would require two full fiscal years to implement.

With the Department's decision favoring early shipment of Site SNM to the Pantex Plant and the Savannah River Site (SRS), DOE now plans to base the decision on possible deferral of the safety margin upgrades on objective evidence that the off-site option is progressing toward timely implementation with uncertainties comparable to those of concern for the ISV in the IPP footnote to milestone 3-5a being resolved. The Board Staff in their early July Site visit expressed concern that the final EIS for transfer of material to Savannah River is scheduled later than the EIS that had been planned for the Interim Storage Vault. This concern will be addressed by DOE in the documented basis for the decision they make in September.

## 2.2 Deliverables

IPP Milestone 3-2 Report completion of priority safety upgrades specified in Table 3-1 by the end of 1997.

Progress toward upgrade project completion in this quarter makes successful completion of this milestone appear possible although real risks remain. Both RFFO and K-H are driving toward timely completion as reflected in the status given above.

IPP Milestone 3-3 Establish and document operation of Building 371 in conformance with an updated AB by December 1996.

This milestone is behind schedule and incomplete although substantial progress has been made with completion of the BIO, the supporting system design descriptions (SERs), the "gap" analysis, and the tentative list of BIO-driven upgrades. The BIO Implementation Plan is nearing completion and will provide a firm basis for rescheduling this milestone by August 25, 1997.

IPP Milestone 3-4 Issue schedule (implementation plan) for further Building 371 upgrades identified during the initial AB development by November 1996.

The implementation schedule containing all BIO-driven additional upgrades will be issued as previously planned by August 25, 1997.

IPP Milestone 3-5 Report completion of other Building upgrades on the following Schedule:

The schedule for these upgrades is the IPP schedule unless and until DOE determines that sufficient assurance of an early off-site option for Site SNM exists to warrant deferral of the safety margin upgrades for one year as discussed in Section 2.1.3.

IPP Milestone 3-6 Reassess the need to complete the other upgrades and inform the Board by September 1998 (Milestone 3-6).

The reassessment will be an ongoing effort as decisions on the disposition of Pu and oxides are reached. The need for these upgrades is dependent upon assurance of alternative offsite shipment or resumption of ISV design and construction. If either of these conditions is met, the upgrades will not be required.



## 2.3 Schedule of Activities

### 2.3.1 Building 371 Authorization Basis

The schedule of key milestones for completion of the AB includes:

- Issue new date for IPP milestone 3-3 (date for Building 371 to be operating in conformance with the BIO) by 8/25/97.
- Complete BIO Implementation Plan by 9/10/97.

### 2.3.2 Building 371 Priority Safety Upgrades

The schedule of key milestones for completion of the priority upgrades, including additional upgrades identified by the BIO and its Implementation Plan, includes:

- Issue schedule (implementation plan) for further Building 371 upgrades identified during the initial AB development by 8/25/97. This is IPP milestone 3-4 rescheduled.

### 2.3.3 Building 371 Safety Margin Upgrades Initiation

- DOE will determine by 9/30/97 whether the initiation of the safety margin upgrades should be deferred to FY-99.

### 3.0 INTEGRATED Pu CONSOLIDATION AND MANAGEMENT

This section corresponds with section 4 of the IPP, and follows the sequence of the Programmatic Elements in that section. The IPP states that, The insights gained on the overall Site risk from residues and the effects of the decision to proceed with the priority Building 371 upgrades and a new ISV are to be integrated with the actions committed to the Board under Recommendation 94-1 to ensure an integrated Site plan for safe Pu management and storage. System engineering principles will be used to develop a strategic plan for residue storage and shipment that incorporates timely consideration of contingencies, such as possible delays in Waste Isolation Pilot Plant (WIPP) opening.

#### 3.1 Accomplishments and Status Summary

As reported in the last quarterly report, the evaluation of alternatives for achieving the IPP-required risk reduction for highly dispersible residues has been completed. Conclusions were issued and incorporated into the Site's 94-1 program plan. The Site Integrated Stabilization and Management Plan (SISMP), Version 6.0, dated March 31, 1997, incorporated the 94-3 residue management recommendations. Included were: pre-stabilization drum removals from Buildings 771 and 776/777 to Building 371; utilization of the pipe overpack container for the transuranic (TRU) waste from dispersible residues after processing; and storage of WIPP-ready waste packages in waste management facilities as necessary outside the Protected Area. Residue storage requirements and the available capacity will be updated as Site planning evolves to ensure residue risk reduction goals can be met. For example, Version 7.0 of the SISMP, completed in July, incorporates minor updates.

#### 3.2 Deliverables

IPP Milestone 4-2 Incorporate selected residue alternatives into existing Site programs by April 15, 1997.

Completion of Milestone 4-2 as of March 31, 1997, was reported in the second quarterly report. This milestone is considered closed.

IPP Milestone 4-3 Establish and document interim storage for the Site's Pu inventory, including residues, by the end of FY02 in a configuration that reduces Site risk due to Pu (metal, oxides and residues) to a level that is a small fraction of the risk from current Pu holdup.

This milestone is on schedule.

#### 3.3 Schedule of Activities

All current activities related to this task are governed by the SISMP and 94-1. There are no near-term milestones for the 94-3 program.

## 4.0 INTERIM STORAGE MISSION

This section corresponds with Section 5 of the IPP and addresses the following mission need: "provide safe and secure interim storage of the Site's plutonium metal and oxide inventory, including pits (if still onsite) and any oxide generated due to residue and solution stabilization activities. The interim storage mission is to begin upon completion of the May 2002 commitment for plutonium metal and oxide repackaging to DOE Standard 3013 and continue until the inventory is shipped offsite (goal is no later than 2015)." Chapter 5 focuses on plans to perform an environmental impact evaluation for an Interim Storage Vault, complete predecisional activities, and base any further action (such as ISV design, construction and operation) on the NEPA outcome.

### 4.1 Accomplishments and Status Summary

As reported in the second quarterly report, DOE issued the Record of Decision for the Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement on January 14, 1997. In this Storage and Disposition ROD, DOE concluded that Site SNM should be shipped to Pantex and Savannah River and thus not require interim storage at Rocky Flats. The DOE elected to make early offsite shipment the preferred option for the ten-year planning that will integrate programs throughout the DOE complex. The DOE also suspended preparation of an Environmental Impact Statement for the ISV (while keeping the option open to recommit to the effort if necessary) and took other actions to prepare for early shipment of Site SNM to Pantex and Savannah River Site (SRS). Work on an ISV for Rocky Flats will not proceed beyond the conceptual design.

The ISV conceptual design review at 90% was completed by an independent engineering subcontractor. The design review results and comments affected details that were readily incorporated into the building design. A separate review was performed by the Geotechnical Peer Review Committee. Based on that review the foundation design concept was changed from drilled cast-in-place piers to a floating slab, resolving the remaining issue outstanding for the conceptual design.

The DOE (RFFO) issued a letter directing that the ISV conceptual design cost estimates were to be based on a reduced storage capacity, assuming shipments to the Pantex Plant would be completed. The final report was revised to incorporate this direction. The design now provides for the same 2600 DOE-STD-3013 cans that are being considered for storage at SRS.

Based on these developments, the Conceptual Design Report (CDR) has been completed with an addendum reflecting building design changes. Cost estimates and analyses to confirm the seismic capacity of the foundation design are included. The report was transmitted to RFFO on July 18, 1997.

### 4.2 Deliverables

Specific deliverables specified by the IPP and the status of each, as related to the ISV are presented below.

IPP Milestone 5-1 Complete NEPA evaluation of alternatives for interim storage by May 1997.

The DOE has terminated efforts to pursue the ISV NEPA evaluation in view of the Record of Decision from the Programmatic Environmental Impact Statement.

IPP Milestone 5-2 Provide ISV design documents, including design criteria, as they are developed and no later than prior to the start of detailed design, including: functional design requirements; and predecisional design reports and drawings. Provide detailed design plans, calculations, drawings and specifications when developed if a decision is made to proceed.

The ISV Conceptual Design Report (CDR) will be provided to the DNFSB when it has been reviewed and found acceptable by the Department. The CDR, with supplements, was provided to RFFO by the Integrating Management Contractor in July.

#### **4.3 Schedule of Activities**

The ISV conceptual design is complete.