



98-0002155

**Department of Energy**

Washington, DC 20585

JUN 17 1998

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

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DNF SAFETY BOARD

Dear Mr. Chairman:

The Department's quarterly progress report on implementation of Recommendation 94-3 is enclosed. This recommendation addressed safety improvements for Rocky Flats Building 371, which will store the site's plutonium pending shipment for disposition. This status report addresses progress of activities described in the revised Recommendation 94-3 Integrated Program Plan of April 28, 1998.

Progress continues on "Priority" and "Authorization Basis" upgrades to Building 371 in parallel with efforts to accelerate shipments of nuclear material off-site. At the same time, the site is proceeding with validation of additional upgrades per the enclosed validation plan. The Rocky Flats Field Office is closely monitoring contractor implementation of the Building 371 Technical Safety Requirements and Basis for Interim Operation to assure that safety controls and upgrades are implemented as required by the revised Authorization Basis.

Sincerely,

James M. Owendoff  
Acting Assistant Secretary for  
Environmental Management

Enclosure

cc: Mark Whitaker, S-3.1



**U.S. DEPARTMENT OF ENERGY**

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

**SIXTH QUARTERLY REPORT**

Reviewed for Classification By

L.E. Kwee, DOE/2290 - (U/NU)

Date: 5/05/98

## EXECUTIVE SUMMARY

This periodic report provides an update on progress with implementation of the Defense Nuclear Facility 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 a revised Integrated Program Plan (IPP, designated "Revision 1", April 28, 1998) which made commitments for actions and decisions. Progress on those actions and results of decisions are reported in this sixth quarterly report.

The revision to the IPP responds to the Board's request of October 15, 1997, reaffirming the Department's commitment to ensure that Building 371 is prepared for storage of Special Nuclear Material beyond 2002 should that prove necessary, while also describing the Department's preferred alternative plan to secure timely off-site shipment of that material, obviating an extended onsite storage mission. The IPP revision, nevertheless, includes a commitment to initiate engineering on the additional upgrades that would be needed to prepare Building 371 for such a mission; the initial engineering activity, a "validation study" to confirm specific required upgrades and resolve their scope, is now underway.

Significant progress has been made in establishing operations in an upgraded Building 371 in accordance with the new Basis for Interim Operations (BIO), including:

- The first two phases of the BIO Implementation Plan (BIO-IP) were completed and preparation for phase 3 management assessment to begin May 5 is nearing completion.
- The scope of the Justification for Continuing Operations (JCO) that will be included in Phase JCO of the Implementation Plan currently includes nine of the upgrades in Table 3-1 that will not be completed as of August 1 and two SERs. The implementation process is being managed to ensure that tasks scheduled for August 1 completion will meet the implementation schedule.
- BIO revisions, both to support new missions being assigned to Building 371 as closure of other, less robust facilities is accelerated and to resolve issues arising during implementation, are being managed to a schedule coordinated with BIO implementation.
- Two of the four remaining priority upgrades have been successfully completed (seismic HVAC upgrades and seismic bracing for attic water pipes) and the remaining two are on-schedule for completion in May and July.
- The BIO-driven upgrades are being managed to a schedule coordinated with the BIO-IP with four to be completed in the next quarter, eight of the remaining designs complete, six evaluation studies in progress, two canceled, and over 40% of the life safety upgrades already completed.

Overall, progress supports successful completion of IPP milestone 3-3, Establish and document operation of Building 371 in conformance with an updated Authorization Basis by August 1, 1998.

The Site is continuing to evaluate alternatives to accelerate successful completion of integrated Pu consolidation and management scheduled for 2002. A decision has been made to install the packaging portion of the prototype plutonium stabilization and packaging system (PuSPS) in Building 371 rather than in Building 707 as previously planned. A detailed plan for installation and utilization of this system to prepare non-pit SNM for off-site shipment is under development. Numerous decisions regarding residue programs are pending, dependent upon either the ongoing environmental review of the Residue Environmental Impact Statement (EIS) or variances requested from Safeguards Termination Limits for shipments to the Waste Isolation Pilot Plant (WIPP). The decision schedule within 1998 is not yet firm. These activities are more fully reported as addressing DNFSB Recommendation 94-1.

Progress was made across the DOE complex in preparing for timely off-Site shipment of RFETS SNM, including:

- NEPA evaluation of the K-area option at the Savannah River Site (SRS) is underway as are pre-decisional studies to assess storage of RFETS SNM in K-area as an alternative to the Actinide Processing and Storage Facility (APSF). The K-area alternative appears advantageous for the overall DOE complex. The K-area plan anticipates CD-3 approval and construction start in September 1998.
- Off-Site shipping from Rocky Flats, including pit shipments to Pantex, was suspended in February to address compliance issues affecting packaging procedures and preparation of accompanying documents. Readiness to resume shipping has been confirmed and resumption is anticipated in early May.
- June 1998 remains a target for the initial shipment of plutonium-bearing materials to SRS in an SST. Packaging of sand, slag and crucible residues for possible shipment is underway, but actual shipment is dependent upon conclusions of the residue environmental evaluation.
- Design of the APSF is on schedule for completion as planned in August 1998.

Overall, the Department believes progress is being made to support timely off-site shipment of RFETS SNM.

Engineering was initiated for upgrades to prepare Building 371 for storage of the Site's non-pit Pu metal and oxide from 2002 to 2015 (i.e., interim storage). A plan for validation of the interim storage upgrades was prepared in March and is being transmitted to the Board with this quarterly report. The team was assembled and work was initiated in accordance with the plan. Initial boundary conditions have been issued for the validation effort, each task team has assessed its assigned scope and begun the identification and assessment of the importance of the objectives underlying each previously identified project. Regular meetings of the Technical Advisory Team have been established to oversee the validation effort. Project identification is on schedule for June as planned, supporting a final report in August.

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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 Revision 1 of the IPP.

## **2.0 COMPLETION OF DNFSB 94-3 SUB-RECOMMENDATIONS**

The corresponding section of the IPP commits to: further updating of the facility Safety Analysis Report should the interim storage mission revert to Building 371 (Sub-Recommendation 2); supplemental actions addressing those risk-dominant accident scenarios which exceed the public Evaluation Guideline of 5 rem (Sub-Recommendation 6); and validation of interim storage upgrades to complete final definition of required upgrades (Sub-Recommendation 8).

Supplemental actions to address risk-dominant accident scenarios are in-progress for inclusion in the annual update to the BIO. Dock fire risks are being reduced by requiring that drums with more than 200 g of Pu be continuously attended, rather than the prior 1200 g threshold. The risk of hydrogen explosion occurring in a drum staged on the dock is being reduced by adding an Administrative Control for sampling-based functional testing of the drum vents already installed. Seismic walkdowns are underway to identify areas where the potential releases within the facility might practically be reduced (e.g., by preventing drum failure caused by impact from unqualified, ceiling-mounted equipment).

The validation activity is addressed in Section 6 of this report.

## **3.0 BUILDING 371**

The corresponding section of the IPP 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."

### ***3.1 Accomplishments and Status Summary***

#### **3.1.1 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 Authorization Basis by August 1, 1998."

Implementation efforts continued in this quarter. Phase 1 was formally implemented in February with BIO.Chapters 1,2, and parts of Chapter 3 superseding FSAR Chapters 1,

3, 4, 7, 8, 9, 10, and 12. The second of four planned implementation phases was completed to implement nine more of the fifteen Safety Management Programs (SMPs) established in Chapter 3 of the BIO and two of the System Evaluation Reports (SERs). The management assessment for Phase 2 was successfully performed and Phase 2 was implemented in March. Portions of BIO Chapters 3, 4, and 5 became effective and FSAR Chapters 13, 14, and 15 were superseded. Preparation for Phase 3 is nearly complete and the management assessment is planned to begin May 5. The Phase 3 scope includes the generic Administrative Controls (ACs) and Limiting Conditions for Operation (LCOs), six of the eleven specific ACs, one specific LCO, and ten additional SERs. The scope of the Justification for Continuing Operations (JCO) that will accompany Phase JCO of the Implementation Plan currently includes nine of the upgrades in Table 3-1 that will not be completed as of August 1 and two SERs. The implementation process is being closely managed to ensure that tasks scheduled for August 1 completion will meet the implementation schedule and not be added to the existing JCO scope.

Changes to the BIO were prepared, approved and incorporated to support sand, slag, and crucible repackaging and implementation of the Administrative Controls. Other new facility missions and activity changes are being evaluated with BIO changes where appropriate, including: high level liquid processing; tap and drain; use of a passive aerosol generator to facilitate D&D of a high airborne activity room; pit leak testing; stacking of certain residue drums; use of pipe overpack containers (POCs); and room conversion. Changes to the BIO TSRs are in process to support implementation, including: deletion of requirements for supply isolation valves and backdraft dampers; addition of supply HEPA filters; a new LCO for certain design features to limit failure modes of required systems; the decision to attend staged drums of 200 g or greater on the dock; and other changes related to upgrade project concept clarification. All of these BIO changes are being managed to a schedule coordinated with the BIO-IP.

### 3.1.2 Building 371 Safety Upgrades

Progress was made in completing the Building 371 priority safety upgrades specified in Table 3-1 of the IPP. Two additional upgrades were completed so that thirteen of the fifteen are now in place. The completed upgrades include:

**Seismic HVAC Upgrades** -- two of the three sub-tasks involved with this project were previously reported as complete (installation of new required seismic bracing on HVAC ducting, and the removal of ducting and piping associated with an HVAC steam ejector that was no longer used). The final sub-task involved addition of anchor bolts for existing ducting supports. The work was underway in December when a discovery was made that the existing floor slab thickness for some of the affected areas did not match the drawing and would be insufficient to support the planned anchors as designed. Redesigns were developed and work was restarted by mid-January when unexpected embedded plates were encountered. This second issue was also resolved and the upgrade was completed in February 1998.

**Seismic Bracing for Attic Water Pipes** -- this project was completed and in final inspection when quality deficiencies were identified. Two non-conformance reports identified 8 attic piping supports not installed per drawing requirements and 72

anchor bolts not installed to the required depth. As previously reported, specific rework packages were developed, reviewed and approved, and appropriate sub-contractor organizational changes were made (addressing definition of roles and responsibilities, craft and supervisory training, and quality assurance staffing and training) to ensure satisfactory completion of rework. The work was completed and verified to be correct and properly documented in April 1998.

Two of the priority upgrades remain incomplete as of April 1998. The status of these upgrades, including their completion schedule, is as follows:

**Plenum Deluge System Modifications** – construction of the plenum deluge system modification is progressing. Completion has been delayed to May 1998 due to technical issues that arose during construction and some building unavailability due to chiller outages. Operability tests to verify required performance have been defined and are being performed for those portions of the system already modified.

**HVAC Isolation Valves** -- design is nearly complete to provide supply HEPA filtration that would obviate reliance on either the backdraft dampers or the supply isolation valves. Construction will be initiated in early May. Construction is scheduled for completion in July 1998.

The BIO-required upgrades and their current schedule are presented in Table 3-1. Work is in progress on each active upgrade to support scheduled completion. In each instance, completion includes any necessary adjustments to affected procedures. The BIO-driven upgrades are being managed to a schedule coordinated with the BIO-IP with four to be completed in the next quarter, eight of the remaining designs complete, six evaluation studies in progress, two canceled, and over 40% of the life safety upgrades already completed.

### **3.2 Deliverables**

IPP Milestone 3-3 Establish and document operation of Building 371 in conformance with an updated Authorization Basis by August 1, 1998.

The BIO-IP provides a sound roadmap for timely completion.

### **3.3 Schedule of Activities**

#### **3.3.1 Building 371 Authorization Basis**

The BIO controls are being implemented in accordance with the BIO-IP. Planned progress in the next quarter includes:

- Begin Phase three management assessment May 5, 1998
- Implement Phase three June 1998
- Submit implementation JCO for RFFO approval June 15, 1998
- Prepare Annual Update July 15, 1998



### 3.3.2 Building 371 Safety Upgrades

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

- Plenum deluge system modifications will be completed in May 1998.
- HVAC Isolation Valves (now Supply HEPA Filtration) will be completed in July 1998.
- Table 3-1 provides the schedule for additional upgrades to be completed in FY-98 and FY-99. Four are scheduled for completion in the coming quarter.

**Table 3-1: BIO-Driven Upgrades and Schedule**

	DESCRIPTION	COMPLETION SCHEDULE	COMPLETION DATE
1	Install Emergency Lights	Provide seismically qualified egress emergency lighting (SC-3 function in Administrative Control [AC] 5.9)	JUL 98
2	Evaluate/Reinforce HVAC Ducting	Ensure ducts credited for tertiary confinement have adequate pressure capacity for tornado atmospheric pressure transient or abnormal ventilation lineups	AUG 98
3	Ensure Lightning Protection	Ensure that security systems to prevent helicopter intrusion do not compromise lightning protection for Building 371	SEP 98
4	Inspect/Repair SC-3 Fire Barriers	Apply lessons learned from Room 3206 evaluation as necessary to ensure one-hour capability of fire barriers that are SC-3 in AC 5.9	OCT 98
5	SNM Storage Rack Repairs	Ensure adequate seismic capacity for storage racks used in vault-type material storage rooms (SC-1/2 SNM Storage Racks in AC 5.9)	NOV 98
6	HVAC Interlock Modifications	Ensure safe failure mode (credited as Passive Design Feature in BIO) in EBE for the supply fan trip function and upgrade interlock to trip return fans as well as supply	SEP 98
7	Extend Roof Drains	Improve runoff during extreme weather conditions	Canceled <sup>1</sup>
8	N2 Failure Prevention Mods	Ensure nitrogen shutoff credited as Passive Design Feature in BIO to prevent Central Storage Vault pressurization after earthquake	SEP 98
9	Counterfeit Bolt Inspection	Review usage of counterfeit bolts and replace any whose capacity will not meet BIO requirements for SC-1/2 systems (94-3 low cost issue)	JUL 98
10	Redundant Zone 3 HVAC Controllers	Provide redundant $\Delta P$ controllers in Zone 3/Zone 4 areas for reliable implementation of LCO 3.1, item 6	JAN 99
11	Drain Chemical Storage Tanks	Reduce inventories of KOH and HNO <sub>3</sub> in outdoor storage tanks to meet requirements of AC 5.2.2, items e and f	JUN 98
12	Upgrade Vault Penetrations for Fire where Practical	Upgrade central storage vault boundaries to SC-1/2 (2-hour) fire barrier requirements where practical (BIO-IP will otherwise ensure that appropriate combustible control limits are established per AC 5.4.2, item 4c)	OCT 98

<sup>1</sup> Existing foundation drains suffice to assure safety; the drain extensions were intended as a good practice to decrease water penetration near the foundation, but the proposed cost was judged to be too high for the low marginal benefit.

			COMPLETION DATE
13	Repair Attic Beam	Compensate for omitted negative reinforcement at the junction of beams B55 and B56	AUG 98
14	Install Attic Leak Detection	Provide capability to detect and alarm if significant attic flooding occurs	JUL 98
15	Miscellaneous BIO Upgrades	a) Install Dock 18T Roll-up Door Interlock b) Verify Seismic Capacity of SC-1/2 HVAC ΔP Sensor Lines c) Provide Lab Propane Tank Seismic Supports d) Complete Any Additional SQUG Walkdowns e) Determine HVAC Scrubber Disposition f) Provide Seismic Restraint for Flammable Liquid Cabinets	MAY 98 MAY 98 Canceled <sup>1</sup> JUL 98 JUL 98 MAY 98
16	Life safety Code Upgrades	Correct Deficiencies in B371 (Material Access Area) per Updated Facility Fire Hazards Analysis	JUL 98

<sup>1</sup> Building 371 has determined that propane will not be used in the laboratory so restraints will not be required.

## **4.0 INTEGRATED Pu CONSOLIDATION AND MANAGEMENT**

The corresponding section of the IPP states that, "The insights gained from the Recommendation 94-3 studies in Phases I and II needed to be integrated with the actions committed to the Board under Recommendation 94-1 to an integrated Site plan for safe plutonium and uranium management and storage. These insights included the contribution to overall Site risk from residues, the improved safety of Building 371 with Priority upgrades and a new BIO, and the commitment to provide an assured facility (on- or off-site) for interim storage of Site SNM. Systems engineering principles were applied to develop and select a strategic approach for residue storage and shipment that incorporates timely consideration of contingencies, such as possible delays in Waste Isolation Pilot Plant (WIPP) opening. The approach that was selected is being implemented through the Site's 94-1 Program. The 94-1 Program is also reducing the risk of SNM storage by stabilizing and repackaging the material; the DOE-STD-3013 compliant packages and the POCs [pipe overpack containers] afford defense-in-depth for current storage and enable the longer term storage plans to be realized."

### ***4.1 Accomplishments and Status Summary***

The Site is actively investigating options with varying reliance on support from other sites in the DOE complex to accelerate 94-1 commitments in a manner that would support Rocky Flats Site closure by 2006. Some of these options are noted as contingencies in the revised IPP. Any that are chosen for implementation will be incorporated in future revisions to the Site Integrated Stabilization and Management Plan (SISMP).

In February, Kaiser-Hill evaluated the impact of delayed delivery of the prototype PuSPS to the Site and recommended that it not be installed in Building 707 as originally planned. The least cost Site option was to prepare material for off-Site shipment without packaging in DOE-STD-3013 containers, while packaging in Building 371 was the next most favorable option. The Department decided to install at least the packaging system from the prototype in Building 371 as there were too many uncertainties that could not readily be resolved affecting the complex-wide acceptability of not packaging the material to the DOE-STD-3013 standard at RFETS. Kaiser-Hill is developing a detailed plan to implement this decision.

### ***4.2 Deliverables***

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

## 5.0 INTEGRATION OF SITE PLANS WITH DOE COMPLEX PLANS

The corresponding section of the revised IPP addresses the Department's baseline plan to prepare for and complete the shipment of the Site's uranium and plutonium metal and oxide beginning no later than 2002. The baseline plan is a commitment that will be executed as planned unless sufficient impediments to off-site shipment emerge to cause the Department to abandon this strategy (the Department would then rely on Building 371 for interim storage as discussed in the following section). The Department's baseline plan is not yet formally complete but includes the draft plan, *Accelerated Cleanup: Focus on 2006*, the Surplus Plutonium Disposition EIS (draft scheduled April 1998) and other completed documents. The mechanism for integration and coordination of these evolving and existing plans is within the scope of this section.

### 5.1 Accomplishments and Status Summary

Progress was made across the DOE complex in preparing for timely off-Site shipment of RFETS SNM, including:

- NEPA evaluation of the K-area option at the Savannah River Site (SRS) is underway as are pre-decisional studies to assess storage of RFETS SNM in K-area as an alternative to the Actinide Processing and Storage Facility (APSF). The K-area alternative appears advantageous for the overall DOE complex. The K-area plan anticipates CD-3 approval and construction start in September 1998.
- Off-Site shipping from Rocky Flats, including pit shipments to Pantex, was suspended in February to address compliance issues affecting packaging procedures and preparation of accompanying documents. Readiness to resume shipping has been confirmed and resumption is anticipated in early May.
- June 1998 remains a target for the initial shipment of plutonium-bearing materials to SRS in an SST. Packaging of sand, slag and crucible residues for possible shipment is underway, but actual shipment is dependent upon conclusions of the residue environmental evaluation.
- Design of the APSF is on schedule for completion as planned in August 1998.

Overall, the Department believes progress is being made to support timely off-Site shipment of RFETS SNM.

### 5.2 Deliverables

IPP Milestone 5-1 Issue ROD selecting the plutonium immobilization site by February 1999.

The Surplus Plutonium Disposition Site EIS is on schedule to support issuance of a Record of Decision by February 1999.

IPP Milestone 5-2 Prepare APSF, or alternate facility, at SRS for Rocky Flats SNM.

a. Complete APSF design by August 1998.

APSF design is on schedule for completion by August 1998.

### IPP Milestone 5-3 Prepare for and transport SNM off-site.

- a. Complete off-site shipment of pits to Pantex by FY99.

Pit shipments are expected to resume in May 1998 which will support shipment completion well before the end of FY-99

- b. Ship plutonium-bearing materials (sand, slag and crucible) from Rocky Flats to SRS in SSTs in June 1998.

Packaging of sand, slag and crucible residues for possible shipment to SRS is now underway at RFETS. The residue EIS is considering pipe-and-go as an alternative to shipment of sand, slag and crucible residues to SRS for Pu recovery in F Canyon. Until the Record of Decision is issued, no shipment to SRS can be made. Nevertheless, completing a shipment of plutonium bearing materials in an SST by June 1998 or soon thereafter is an objective and alternatives may be considered in the event the SS&C materials are not authorized for shipment by that time.

- c. Procure approved shipping containers (9975s) for metal and oxide shipment.

Two-hundred 9975's have been ordered by SRS for transport of sand, slag and crucible and fluoride residues from RFETS. In FY-99, an additional 1700-2000 are to be ordered to support accelerated shipment of RFETS oxides to SRS for storage in K-area, if that alternative is selected.

### **5.3 Schedule of Activities**

Kaiser-Hill is developing a plan for installation of the packaging portion of the prototype PuSPS in Building 371. The plan will include separate ovens for oxide stabilization to complement the packaging system. The plan will include a schedule for preparation of non-pit plutonium for off-site shipment. The system installation conceptual design will follow and be completed in July.

## 6.0 INTERIM STORAGE MISSION CONTINGENCY – BUILDING 371

This section corresponds with Section 6 of the revised IPP and addresses the following mission need for the Building 371 contingency option: "provide safe and secure interim storage of the Site's non-pit plutonium metal and oxide inventory, including any oxide generated due to residue and solution stabilization activities, if off-site shipment is not realized in a timely manner. The interim storage mission is to begin in 2002 and continue until the inventory is finally shipped off-site (no later than 2015)." Chapter 6 focuses on plans to validate and define specific scopes for upgrades in FY-98 to prepare Building 371 for the interim storage mission, to design validated upgrades in FY-99, and to implement them in the facility no later than 2002.

### 6.1 Accomplishments and Status Summary

Engineering was initiated for upgrades to prepare Building 371 for storage of the Site's non-pit Pu metal and oxide from 2002 to 2015 (i.e., interim storage). A plan for validation of the interim storage upgrades was prepared and formally issued to DOE in March. The team was assembled and work was initiated in accordance with the plan. Initial boundary conditions have been issued for the validation effort, each task team has assessed its assigned scope and begun the identification and assessment of the importance of the objectives underlying each previously identified project. Regular meetings of the Technical Advisory Team have been established to oversee the validation effort. Project identification is on schedule for June as planned, supporting a final report in August.

### 6.2 Deliverables

Milestone 6-1 Complete validation assessments for the Interim Storage upgrades (those that are not "Priority" in Appendix C), including a schedule for design engineering to be performed in FY99, documented, and reported by August 1998. Provide the plan for the validation effort to the Board by March 1998.

The plan was completed and issued in March of 1998 as committed. The validation effort is underway and on-schedule for completion in August of 1998.

Milestone 6-5 Assess the following "Go/No Go" criteria for assured success of off-site shipment in Section 5 and report when they are satisfied:

1. APSF construction is funded and underway with sufficient storage capacity committed to RFETS material or alternate acceptable storage off-site is authorized, funded, committed for storing RFETS material, and construction is underway.
2. The ROD for a plutonium disposition site is issued and identifies SRS as a disposition site or the MD PEIS ROD is amended to delete this condition as a requirement for receipt of RFETS material and any alternative NEPA requirements are fulfilled.
3. The PuSPS at Rocky Flats is operational and authorized to begin material stabilization and packaging or the Department has established firm plans for packaging to be performed off-site.
4. A shipment of plutonium-bearing materials from RFETS to SRS in SSTs has been successfully completed; specific plans are in place to provide for future shipments.
5. Adequate assurance is provided that off-site pit shipments are on schedule for completion by the end of FY99.

When the Go/No Go criteria are satisfied, all remaining work (including design, construction, or other implementation) on the validated upgrades and the SAR to establish the Building 371 interim storage option may be discontinued by the Department. The Department will formally notify the Board before the upgrades are discontinued.

Section 5.0 of this report addresses the status of complex-wide activities supporting fulfillment of these criteria. Efforts are currently judged to be on track to support a favorable judgment in the first quarter of calendar 1999.

### **6.3 Schedule of Activities**

Intermediate milestones for the validation activity are provided in the March plan. Key future dates include:

- Task Teams complete alternative project definitions and select preferred alternative for each objective May 1998
- Validated projects selected and initial draft prepared June 1998
- Final draft prepared July 1998
- Final report issued August 1998



Attachment 1  
98-RF-01454  
7 pages

**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**

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

**BUILDING 371 INTERIM STORAGE UPGRADE  
VALIDATION PLAN**

\*REVIEWED FOR CLASSIFICATION  
By *[Signature]*  
Date 3/23/98 (U/N)

# BUILDING 371 INTERIM STORAGE UPGRADE VALIDATION PLAN

This document presents the plan to validate a set of interim storage upgrades for Building 371 at the Rocky Flats Environmental Technology Site in accordance with commitments made in the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-3 Integrated Program Plan (IPP), as revised in February of 1998 (ref. 1). Validation involves the consideration of alternatives (including those alternatives selected in prior studies and identified in the IPP), the selection of projects, and the establishment of a firm scope of work for each selected project. Interim storage of the Site's special nuclear material (SNM) is a contingent mission for the facility that would extend from 2002 to ~2015 in the event that current efforts to ensure off-site shipping in time to obviate interim storage at the Site prove unsuccessful. This document complements the discussion of validation in the IPP by providing additional detail on the study boundary conditions, the criteria for selection, the alternatives to be considered, the task organization and staffing, and the specific milestones to ensure timely completion.

## 1.0 Background

As part of the Department of Energy's (DOE or the Department) response to DNFSB Recommendation 94-3, Building 371 is undergoing a series of upgrades to provide safe storage of the Site's plutonium metal and oxide for near-term facility missions (i.e., through approximately 2002). The near-term missions include storage, stabilization, and repackaging of the SNM in preparation for off-site shipment. The "priority" upgrades identified in Table 3-1 of the DNFSB Recommendation 94-3 IPP are nearing completion and a second series of upgrades related to the Basis for Interim Operations (BIO, ref. 2) and identified in Table 3-2 of the IPP is in progress for completion in FY-98 and early FY-99. The IPP further commits to perform additional upgrades to prepare the facility for a contingent interim storage mission extending from 2002 through ~2015. These "Interim Storage Upgrades" are to be selected in FY-98 through the validation study which is the subject of this plan. They are to be designed in FY-99 and a construction schedule is then to be prepared which supports completion by 2002. These activities on interim storage upgrades are to proceed until the Go/NoGo criteria (IPP deliverable 6-5) for timely off-site shipment to obviate the interim storage mission are satisfied.

The original IPP (ref. 3) identified three sets of upgrades to support the interim storage mission. These upgrades were selected in a study (ref. 4) completed early in 1996 and were designated as "safety margin", "material relocation", and "security" upgrades. Their selection was based on scoping studies performed to support a decision on how best to prepare the Site for interim storage. In those studies a new interim storage vault (ISV) was concluded to afford significant additional safety margin at an anticipated lower cost than Building 371. The three sets of upgrades for Building 371 were selected using a cost/benefit screen that relied on preliminary subjective estimates of the benefit dimensions, including nuclear safety. With the three sets identified, the overall upgrade scope was judged to be reasonably representative of the cost of preparing Building 371 for interim storage.

Subsequent activities, including preparation of the BIO and development of a new Site closure plan, afford a new, more detailed and objective context for reconsideration of the appropriate interim storage upgrades. Such reconsideration is a logical extension of the systems engineering approach adopted for the original Recommendation 94-3 studies and embodied in the IPP. Thus, this validation process is to begin in March 1998 and be completed in August 1998 with a report of recommendations and their technical basis. The validation study will be conducted by Kaiser-Hill Company, L.L.C. (K-H) and Safe Sites of Colorado, L.L.C. (SSOC) engineers (including Building 371 representatives), with sub-contractor support.

## **2.0 Mission**

The mission for Building 371 that warrants the interim storage upgrades is taken from the DNFSB Recommendation 94-3 Integrated Program Plan and is as follows:

To provide safe and secure interim storage of the Site's non-pit plutonium metal and oxide inventory, including any oxide generated due to residue and solution stabilization activities, if off-site shipment is not realized in a timely manner. The interim storage mission is to begin in 2002 and continue until the inventory is finally shipped off-site (no later than 2015).

## **3.0 Scope**

The IPP affords a separate statement that defines the scope of the validation program:

Engineering for the Interim Storage upgrades is being initiated in FY98, beginning with validation. The upgrades to be considered during validation and the specific validation requirements to be addressed for each one are given in Table 6-2. In addition, as part of the validation efforts, the scope, cost and schedule estimates will be updated for each validated upgrade. As part of this effort, studies needed to finalize the design concepts will be performed. The scope for the upgrades that are validated will be updated with sufficient detail to support completion of design in FY99 and to confirm that the total scope can be implemented by 2002.

## **4.0 Technical Approach**

### **4.1 Summary**

Each of the proposed modifications (IPP Table 6-2) was intended to provide a margin of safety or security for storage conditions expected to exist during the interim storage interval (2002 to 2015). The security upgrades, which may or may not be warranted for interim storage, are outside the scope of the IPP and will be removed from the validation effort for separate consideration by responsible personnel. In the current context provided by the evolving Site closure plan, each specific safety upgrade originally selected may no longer be the preferred alternative for achieving the underlying safety objective and each underlying safety objective may no longer warrant the priority it was originally given. Therefore, the function(s) each upgrade was intended to perform to increase the interim storage safety margin will be determined together with any interdependence on other upgrades to achieve the intended benefit. The importance of the potential improvement will then be assessed, based on the BIO safety perspective updated by considering the impact of changes in facility configuration expected by 2002. If the improvement warrants further study, the potential for more effective alternatives will be addressed, and the most effective project(s) will be identified. When the complete set of most-effective projects has been identified, the selection criteria will be used to determine which of them should be included in the set of projects selected to support interim storage. For the selected projects, any remaining concept issues will be resolved and a determination will be made as to whether or not prompt implementation is warranted to support the current facility mission.

### **4.2 Study Boundary Conditions**

The IPP identifies two significant decisions incorporated in the Site closure plan that differ from early 1996 expectations and substantially affect the validation study: the current Site boundary and the Site fire department will be maintained while SNM is onsite. These examples illustrate the importance of forecasting such boundary conditions and the uncertainty involved in projecting four years ahead. Key

boundary conditions must be identified for the Site, the facility, and the material. An initial task is planned to identify the significant boundary conditions, uncertainties affecting them, and timetables for resolution where available. For some uncertainties, ranges will be recommended that may require sensitivity studies for individual projects to ensure that the validation conclusions do not depend upon indeterminate items. This list will be updated if changes arise during the course of the study.

Additional Site boundary conditions of interest include the Site population and activity levels forecast in the vicinity of Building 371, the projected Site risk level and the key contributors to it, and the security boundary around Building 371. Key facility boundary conditions include the remaining facility missions, the hazardous inventory and its distribution in the facility (particularly the quantity and configuration of remaining holdup), the level of ongoing D&D activity (including plans affecting 374 or the support facility), and the facility population. Any significant reductions in building services anticipated during interim storage should also be identified (e.g., facility heat, ventilation in unused areas without dispersable material, CSV deinerted, etc.). The key SNM boundary conditions include the packaging (i.e., 3013s as previously assumed or produce cans if a decision is made not to install the packaging line on Site) and the temperature limit for packaged metal.

### **4.3 Criteria for Selection**

The criteria for upgrade validation will be consistent with those used in earlier Recommendation 94-3 studies. In particular, the BIO criterion of 5 rem to the maximally exposed off-site individual (MOI) at the Site boundary will be a firm criterion that must be satisfied by the 2002 facility configuration using safety analyses comparable to those in the BIO. Upgrades sufficient to satisfy this criterion must be identified and validated. These upgrades will be considered necessary to ensure adequate safety and their selection will not depend upon cost benefit considerations (the least cost alternative to achieve the criterion may and will be preferred).

Further upgrades will be considered to reduce facility operating risk commensurate with the projected Site risk level in 2002 or shortly thereafter as in-progress shipments and D&D activities are completed. These upgrades will focus on practical alternatives recognizing that Building 371 is an existing facility. Selection will consider cost benefit focused on safety only and relative to other activities completed or planned to achieve comparable Site risk reduction. The result will be a proposed residual risk level for Building 371 that is both acceptable in an absolute sense and relatively difficult to reduce further.

### **4.4 Alternatives to be Considered**

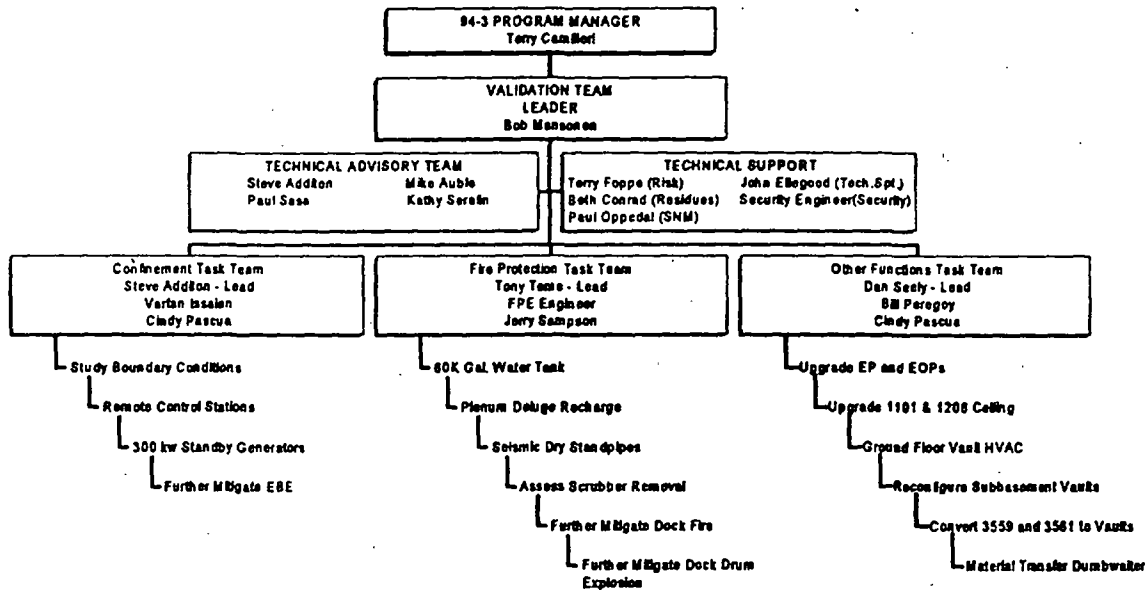
The experience with system engineering at ICF Kaiser, Inc. has been that failure, when it occurs, is most often due to inadequate identification of alternatives. Thus, the validation of each upgrade will include a sub-task to identify alternatives for consideration that may afford significant advantages over the current upgrades while accomplishing comparable or even greater safety improvement. The task engineers will perform an initial evaluation and the Technical Advisory Team will critically review it, with iteration, if necessary, to finalize practical options. An alternative study will then be completed to select the most promising option(s).

### **4.5 Task Organization and Staffing**

The project staffing and team organization is illustrated in Figure 4.5-1. The project sponsor is the Kaiser-Hill 94-3 Program Manager. The project will be managed by an appointed Validation Team Leader who will oversee and coordinate the individual validation activities. He will be responsible for maintaining the

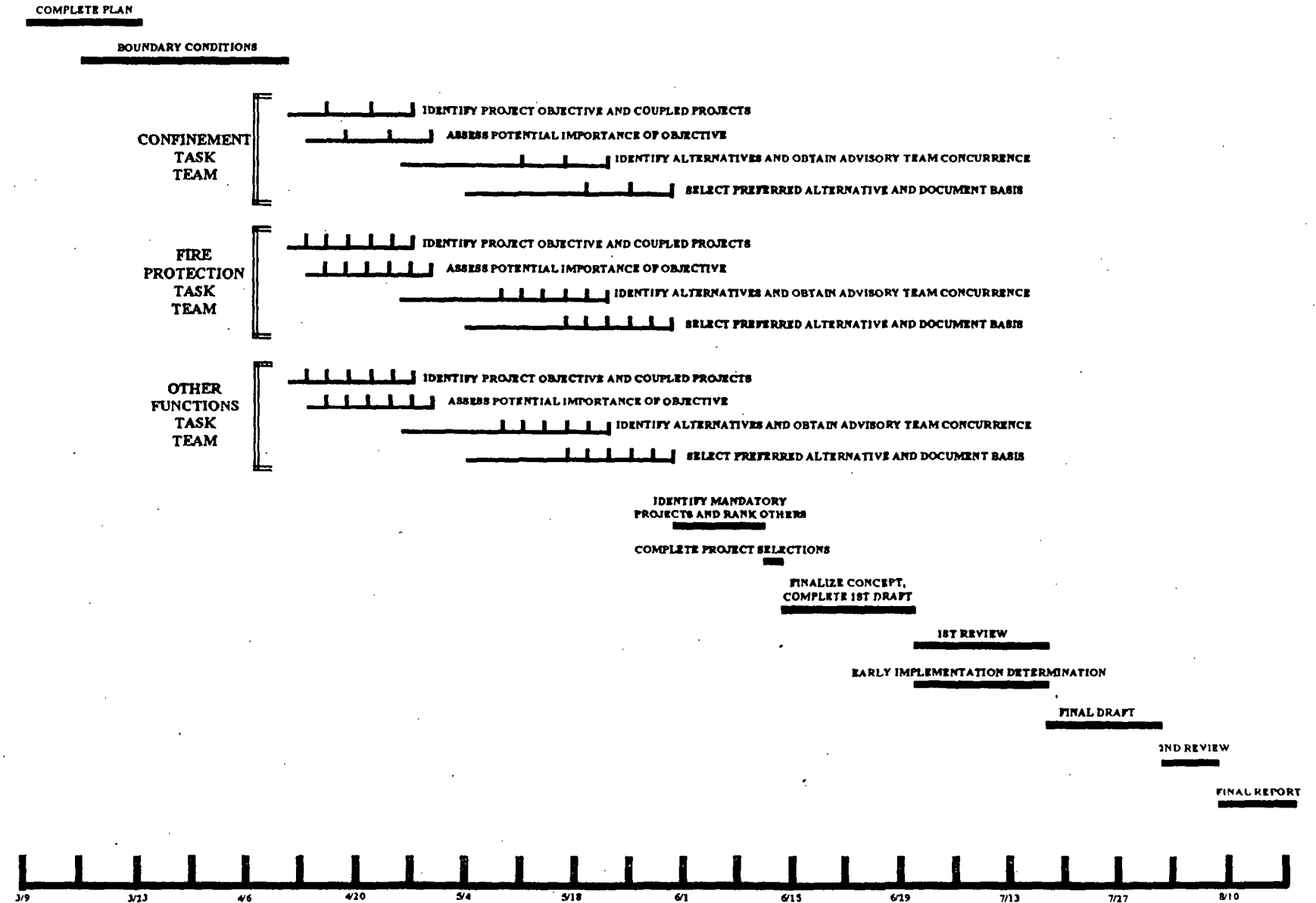
project on schedule, interfacing with technical and support resources in resolving project issues and will keep the project sponsor apprised of project status. He will contribute to specific project activities when available. Three Task Teams will perform the validation activities for specific projects. These teams will address key safety functions in Building 371, including Confinement, Fire Protection, and Other Functions (principally material forms, locations, and related interior requirements). The Other Functions Task Team will also establish and maintain the boundary conditions. Three individuals provide technical support to all teams on issues related to boundary conditions, program needs, and upgrade risk impacts. The Technical Advisory Team provides oversight based on Recommendation 94-3 history and facility management perspective.

**FIGURE 4.5-1 94-3 INTERIM STORAGE UPGRADES VALIDATION TEAM**



The sequencing of specific validation tasks is illustrated in Figure 4.5-2. Task Team organization and familiarization that will parallel the boundary condition definition task is not explicitly shown. This activity is important, however, to enable the overlapping sequencing of up to six projects per team to proceed as scheduled.

**FIGURE 4.5-2 94-3 INTERIM STORAGE UPGRADES VALIDATION SCHEDULE**



#### 4.6 Milestones

The project runs from March to August 1998. The final product must be in a format that is suitable for presentation to the Department of Energy, Rocky Flats Field Office (DOE, RFFO). Individual projects scopes must be sufficiently defined to support firm design work scopes. Milestones to meet these objectives are as follows:

TASK OR DELIVERABLE	DATE DUE
• Assembly Project Team, Reviewed on Project Plan	Week of March 16
• Complete Validation Plan	March 23
• Complete Boundary Conditions Guidelines	April 10
• Project Status/Issue Resolution	Weekly
• Consolidated Project Status	Monthly
• Perform Evaluation Cycle for Each Project ⇒ Identify objective and coupled projects ⇒ Assess potential importance of objective ⇒ Identify alternatives and obtain advisory team concurrence ⇒ Select preferred alternative and document basis	All complete by May 28
• Identify mandatory projects and rank remaining preferred alternatives by benefit/cost ratio	June 9
• Complete project selections	June 11
• Resolve Concept Issues and Submit First Draft	June 30
• Determine if Early Implementation is Warranted	July 15
• Draft Review Complete	July 16
• Final Draft Submittal	July 31
• Final Draft Review Complete	August 6
• Project Report Submittal	August 18

#### 5.0 References

1. U. S. Department of Energy, *Defense Nuclear Facilities Safety Board Recommendation 94-3 Integrated program Plan*, Revision 1, February 1998.
2. Kaiser-Hill, L.L.C., *Basis for Interim Operation Building 371/374 Complex*, Revision 2, Rocky Flats Environmental Technology Site, Golden CO, September 10, 1997.
3. Rocky Flats Environmental Technology Site, *Defense Nuclear Facilities Safety Board Recommendation 94-3 Integrated Program Plan*, Revision G, Golden CO, July 1966.
4. Kaiser-Hill, L.L.C., *DNFSB Recommendation 94-3 IP Task 3-2 Report, Building 371 Interim Storage Mission Summary Report*, Rocky Flats Environmental Technology Site, Golden CO, March 1996.