DNFSB/MISC-081

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 31, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

Public Reading Room
U. S. Department of Energy
Idaho Operations Office

FROM: William Von Holle

SUBJECT: DOE Trade Study Meeting on 94-1 Plutonium Storage Commitments

1. **Purpose:** This trip report documents observations by the Defense Nuclear Facilities Safety Board (Board) technical staff (William Von Holle) resulting from his attendance at a meeting held in Denver on March 21- 22, 1995. The purpose of the meeting was to organize a group to perform a trade study on plutonium metal and oxide storage according to the Department of Energy (DOE) Standard called for in the DOE 94-1 Implementation Plan , February 28, 1995.

2. **Summary:** The study group decided to analyze two alternatives to meeting the commitment date of 8 years for storage of plutonium in accordance with the recently published standard. The first is based on current schedules and activities, and the second is based on the development and deployment of a highly automated calciner and a bagless transfer system. Each alternative will include the commitment in the Implementation Plan and deviations of plus four and plus eight years. The report is to be completed by May 15, 1995.

   Several tasks were discussed at the meeting and assigned to be completed by March 29, 1995. Among them were the collection of information to summarize incidents of container failure and the listing of the generic hazards of the materials involved. These are being done to rank the relative risk of the materials in the inventory.

   The study leader explained the study objectives in terms of assessing and comparing the alternative approaches for repacking all plutonium metal and oxides in accordance with the storage standard, using an integrated approach that best employs the resources in the whole DOE complex. The Board's staff member believes that although the group leader and members are sincere in their motives, the trade study could be used to delay the completion of the repackaging according to the Standard and affect the commitments of the Implementation Plan.

3. **Background:**

   a. The Implementation Plan calls for a trade study that will consider risk to workers and the public, radiation exposure to the worker, waste and discharges to the environment, cost impacts, and impact on other activities to be completed by May 15, 1995. It states that the schedule could be shortened or lengthened beyond 8 years depending on the results of

the trade study, even though the Implementation Plan makes the commitment to repackage all plutonium and oxide according to the standard by 2002. All sites except Los Alamos (LANL) submitted plans to DOE to conform to the 8-year schedule. LANL stated it needed more money to complete the treatment and repackaging by 2002. In discussions between DOE and the Board's staff before the issuance of the Implementation Plan of February 28, DOE stated that LANL would receive the resources it needs to complete the repackaging by 2002.

4. Discussion

a. Representatives from the major plutonium sites were present at the meeting. The attendance list is attached. The study director was tasked by the Nuclear Material Task Group Leader to organize and complete the study. The attendees questioned the need and purpose of the meeting. They stated that there were more important things to do with their time, and that for some of the sites, plutonium repackaging has a lower priority compared to other activities such as residue treatment and repackaging. There were also questions about how other trade studies which may be done on other materials such as the residues would effect the outcome of this study.

b. LANL was tasked to collect and summarize all incidents of plutonium container failure. LLNL volunteered to state the hazards of metal, and Rocky Flats Environmental Technology Site will do the same for oxide for various storage conditions. It appears that LANL is attempting to justify a priority list of items to be treated and repackaged based on the risk of accidents. A member of the group questioned the need for such an analysis noting that most of the incidents were caused by faulty Quality Assurance, which could be true for any material or packaging type, and that previous studies have pointed out the hazards of the current packaging. The task leader and the majority insisted that the risk analysis be done, however.

c. All sites were asked to augment the inventory of metal and oxide presented in the Implementation Plan with expected increases from solution precipitation and residue treatment plans. The technical site representatives stated that the inventories in the Implementation Plan could be as much a 50 percent in error because of the hurried nature of the count for this document.

d. The discussion of the alternatives for use in the study was a major part of the tasking of the group. Starting from the three simple alternatives suggested by the Nuclear Material Task Group Leader in his requesting memo, the group expanded this to six; then reduced it to two. One of the suggested alternatives, a no action baseline plan, was rejected by the group. The second suggested alternative was to make minor modifications on existing equipment and stabilize and repack all materials by 2002. The third also relies on existing

facilities, but the schedule for completion would be determined by "present budget planning projections. "The group expanded the alternatives to several more, including shipping metal from Hanford, using a central automated facility, or a new facility at each site and assuming an availability date for "bagless transfer. "In the end they agreed to develop just two. One was identical with the second suggested alternative above, using existing equipment, and completion by 2002. The second was to develop, deploy and process materials with new, highly automated, high throughput calciners for oxide plus a bagless transfer technique. Each included the Implementation Plan commitment and deviations of plus four and plus eight years.

e. LANL agreed to develop an analytical method to compare alternatives based on the performance measures: cost, worker exposure, risk to the worker (off normal conditions), risk to the public, and waste generated. This presumably will be done according to the draft "Guidelines for Trade Study Analysis,"distributed at the meeting, which explains the basic guidelines for conducting these studies including the above performance measures and a weighted scoring factor for each. Cost is mentioned prominently in the guidelines as an important assessment of the "resource implications" of each alternative.

f. This trade study and others possibly to follow were not prominent in the Implementation Plan. However, the study could be used to provide a rationale to extend the commitments of the Plan. As such, the staff believes open-ended trade studies are a defect of the plan which should be carefully considered. In this case, the plan promises to repack all plutonium according to the standard by 2002; then proceeds to introduce a trade study which allows for large extensions of time for some materials. If the trade studies were used merely to scope alternate treatment methodologies and discover the most effective ways to carry out the implementation, there would be no conflict with Recommendation 94-1.

5. **Future Actions:** The DNFSB staff will continue to monitor the progress of this group as well as others formed for other 94-1 subrecommendations.

Plutonium Storage Trade Study Meeting

Dates: March 21-22, 1995
Location: Denver Co.

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