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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004  
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April 19, 1995

Mr. Mark Whitaker, EH-9  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585

Dear Mr. Whitaker:

Enclosed for your information and distribution are eight Defense Nuclear Facilities Safety Board staff reports. The reports have been placed in our Public Reading Room.

Sincerely,

A handwritten signature in black ink, appearing to read "G. W. Cunningham".

George W. Cunningham  
Technical Director

Enclosures (8)

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 5, 1994

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director

**FROM:** J. T. Arcano, Jr.

**COPIES:** Board Members

**SUBJECT:** DNFSB Staff Comments on the Defense Waste Processing Facility  
*Draft Supplemental Environmental Impact Statement*

1. **Purpose:** This report documents a review of the Defense Waste Processing Facility (DWPF) *Draft Supplemental Environmental Impact Statement (EIS)* by Defense Nuclear Facilities Safety Board (DNFSB) Staff members J. Arcano, D. Burnfield, M. Helfrich, D. Lowe, J. MacEvoy, S. Stokes, and D. Winters. This review was conducted to identify technical issues in the draft supplemental EIS related to the protection of the health and safety of workers and the public.
2. **Summary:** The DWPF draft supplemental EIS was issued in August 1994, to address the environmental impacts of design and process modifications to DWPF since 1982. Department of Energy's (DOE's) proposed action is to continue construction and begin operation of the DWPF as currently designed, including the use of the In-Tank Precipitation (ITP) process for removing radionuclides from the highly radioactive salt fraction of the waste. DNFSB Staff review of the DWPF draft supplemental EIS resulted in the following general conclusions:
  - a. The discussion of environmental impacts does not provide sufficient detail to determine the validity of a number of analyses in the areas of risk, waste generation, radiological air emission, and mitigation measures.
  - b. The analysis of environmental impacts contained in the draft supplemental EIS is not based on a systematic evaluation of the DWPF life cycle.
3. **Background:**
  - a. The DWPF draft supplemental EIS was issued in August 1994, to address the environmental impacts of design and process modifications to DWPF since 1982. Previously, a 1982 EIS, along with its Record of Decision and a subsequent Environmental Assessment, *Waste Form Selection for Savannah River Plant High-Level Waste*, were issued for the construction and operation of the DWPF.

- b. DOE's proposed action presented in the draft supplemental EIS is to continue construction and begin operation of the DWPF as currently designed, including the use of the In-Tank Precipitation process for removing radionuclides from the highly radioactive salt fraction of the waste. DOE also considers the use of the Ion Exchange process as a major alternative to the ITP process and examines the no-action alternative (high level waste continues to be stored in the waste tanks).
- c. The comment period for the draft supplemental EIS extends through October 11, 1994.

**4. Discussion:** DNFSB Staff comments on the DWPF draft supplemental EIS are:

- a. The discussion of environmental impacts does not provide sufficient detail to determine the validity of the analyses from a health and safety impact on the environment.
  - 1. The risk curves presented on page 2-48 may be misleading in that a detailed subject (risk assessment) appears to have been oversimplified. There does not appear to be any analysis that expresses the risks in quantitative terms so they can be compared numerically. For example, the risk associated with the "no action" alternative does not account for aging tank systems; if it did, the risk would not be depicted as constant over time. Furthermore, no basis appears for the rates of risk increase or reduction; therefore, the step functions and linear relationships do not adequately describe the risk.
  - 2. Regarding "Waste Generation," no "impacts" have been provided, but rather, a waste volume projection. This is deficient relative to a performance assessment analysis in which a detailed study is made of the effect of the waste form on the migration and uptake of radionuclides. Serious consideration of the impacts of waste generation in the selection of a preferred alternative cannot be accomplished simply by trading off the volumes of waste generated. It requires a much more rigorous analysis.
  - 3. Section 4.1.4.2.2, *Radiological Air Emission Impacts* from operations in the proposed action, states that "since the original EIS in 1982, process changes in DWPF have resulted in differences in estimates of releases of radioactivity to the environment. Additionally, some of the parameters for determining doses from atmospheric releases have changed." There is no mention of the fact that the computer models, which are Savannah River Site (SRS)-specific, have also changed from the time of the original analysis (1982), nor is there any attempt to determine what kind of impact these changes would have had on the calculations of the impact from the original actions proposed in 1982. Therefore, comparing the impact from the original proposed action to the currently proposed action (page 4-12) cannot be meaningful.

4. Section 4.3.4.2.2, *Radiological Air Emission Impacts* from operations in the ion exchange alternatives, references the results of the analysis performed for the proposed action, with no indication that separate analyses were done for the alternatives or the rationale for not doing separate analyses. As presented, it is not possible to determine if it is appropriate to assume that the radiological impacts from the alternative are the same as those from the proposed action.
  5. Section 4.1.18, *Mitigation Measures*, discusses mitigation measures related to the DWPF vitrification facility, but fails to discuss mitigation measures taken for the proposed action (In-Tank Precipitation Facility). The DNFSB Staff believes that ITP mitigation measures should be addressed in the draft supplemental EIS.
- b. The analysis of environmental impacts contained in this draft supplemental EIS is not based on a systematic evaluation of the DWPF life-cycle. In particular, decontamination, pollution prevention, and waste minimization do not appear to have been considered in detail as integral parts of the DWPF life-cycle.
1. Section 3.13, *Decontamination and Decommissioning*, states that some facilities "will become contaminated as a result of DWPF startup. All SRS facilities, including those involved in the proposed action, will be evaluated for contamination as part of the decommissioning process." This approach does not take a systems engineering view of the facility which would require that evaluation of the contamination, including its minimization, be addressed throughout the entire life cycle of the facility, from design through decommissioning.
  2. The draft supplemental EIS does not specify whether the air emissions projected for normal operation under the proposed alternative also include those that would come from incineration of the benzene at the consolidated incineration facility (CIF). A systematic analysis of the "environmental impacts" of DWPF operation should include the emissions for CIF as well.
  3. The environmental impacts of the disposition of contaminated failed or spent equipment have not been identified or analyzed in the draft supplemental EIS.
- c. Sections 2.2.9 and 3.11.2.2 imply that a radiological control program is in place at DWPF which provides provisions for control of radiological work, worker training, dosimetry, respiratory protection, and radiation program reviews. Although a SRS Radiological Control program exists, it has not yet been implemented at DWPF.
5. **Future Staff Actions:** No further DNFSB Staff action is anticipated regarding the DWPF draft supplemental EIS.