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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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July 6, 1992

The Honorable James D. Watkins  
Secretary of Energy  
Washington, DC 20585

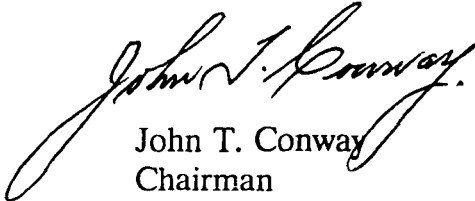
Dear Mr. Secretary:

On July 1, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-4 which is enclosed for your consideration. Recommendation 92-4 deals with the Multi-Function Waste Tank Facility at the Hanford Site.

42 U.S.C. § 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161-68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the Federal Register.

Sincerely,



John T. Conway  
Chairman

Enclosure

RECOMMENDATION 92-4 TO THE SECRETARY OF ENERGY  
pursuant to 42 U.S.C. § 2286a(5)  
Atomic Energy Act of 1954, as amended.

Dated: July 6, 1992

As required by the Atomic Energy Act, the Defense Nuclear Facilities Safety Board (DNFSB), conducts reviews and evaluations of the design of new Department of Energy defense nuclear facilities before and during their construction. Under this statute, the DNFSB is also required to recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the DNFSB considers necessary to ensure adequate protection of public health and safety.

The Board has performed reviews of the Multi-Function Waste Tank Facility (MWTF) project to be located at the Hanford Site in the State of Washington. The MWTF is an element of the Hanford Tank Waste Remedial System (TWRS) Program which eventually will provide for the ultimate treatment and disposal of the Hanford Site tank waste. We have reviewed information received in the form of briefings and presentations by DOE Headquarters personnel, DOE Richland personnel, Westinghouse Hanford Company personnel, and Kaiser Engineers Hanford personnel as well as analysis of relevant documents. The Board's reviews to date have been concerned with such matters as the application of standards, including DOE orders and directives, and commercial nuclear industry practices as well as other aspects of the project which relate to ensuring adequate protection of the health and safety of the public.

The conceptual design of the MWTF project is now nearing completion. The Board believes that it is appropriate at this time to assure that the design of the MWTF and other new defense nuclear facilities incorporates engineering principles and approaches, detailed engineering criteria, and practices that are essential to ensure adequate protection of public health and safety. These include:

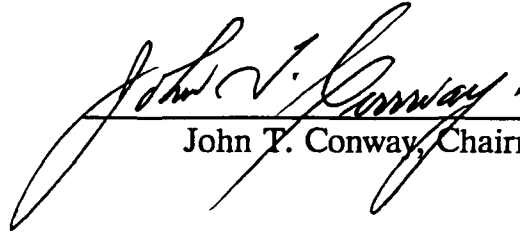
- o The design needs to be appropriately conservative with respect to safety.
- o The design bases (criteria) need to be clearly defined, coherent, and compatible with the facilities' perceived lifetime functions (i.e., Functional Design Criteria) and documented.
- o The design bases and the resulting facility design need to reflect and incorporate the requirements of appropriate standards as that term is used in the Board's enabling statute and thus including DOE orders and directives and commercial nuclear practices, as well as any other factors that may be required for the safe and reliable operation of the facility throughout its entire life.
- o The design, construction, and start-up activities need to be performed by those who will ensure the completed project is of the quality necessary to provide adequate protection of public health and safety.

- o The design effort needs to be organized such that there is continuity through all phases (conceptual design, preliminary design, final design, construction, testing...) so that all aspects of the process that affect safety are clearly delineated and that line responsibility is clear.
- o The DOE organization responsible for the project needs to have technically qualified personnel in numbers sufficient to provide direction and guidance to contractors performing all phases of the effort and to assess the effectiveness of contractor efforts.
- o The project organization and operations need to reflect a clear and effective chain of command with responsibility, authority, and accountability clearly defined and assigned to individuals within the respective project organizations.
- o The functions and responsibilities of all DOE and contractor organizations involved in the project need to be delineated in writing in a single document.

The Board's view of the Hanford MWTF's conceptual design performed to date is that the design does not clearly present and delineate those aspects that ensure that the public health and safety can adequately be protected. In particular, the MWTF appears to be a project 1) without a well-defined mission or functional requirements (e.g., waste treatment or storage), 2) predetermined to consist of four one-million-gallon tanks regardless of their intended uses, and 3) managed without sufficient regard for technical issues and engineering involvement. The continuing phases of the design and construction are about to begin and the Board seeks to be assured that the design of the tanks as they are built incorporates the appropriate levels of nuclear safety. Further, the Board recognizes that many of the nuclear safety concepts and assurances would normally be provided in the series of facility Safety Analysis Reports and would include design bases, safety system analyses, analysis methods and accident analyses. However, to ensure that appropriate nuclear safety characteristics are included in the design efforts, the Board recommends the following to the Secretary of Energy:

1. Establish a plan and methodology that results in a project management organization for the MWTF project team that assures that both DOE and the contractor organization have personnel of the technical and managerial competence to ensure effective project execution. This should emphasize management aspects of the project necessary to ensure adequate protection of public health and safety and should include the integration of professional engineering and quality assurance as necessary into the project, the application of appropriate standards and approved Department of Energy requirements, and the establishment of clear lines of responsibility and accountability.

2. Identify the design bases and engineering principles and approaches for the MWTF project that provide the data and rationale to show that the design for the MWTF conservatively meets the quantitative safety goals described in the Departments' Nuclear Safety Policy (SEN-35-91). The Board believes that this would include items related to standards, identification of safety related items, detailed design bases, functional design criteria, and safety analyses.



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John T. Conway, Chairman