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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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April 21, 2009

The Honorable Steven Chu
Secretary of Energy
U. S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Chu:

The Defense Nuclear Facilities Safety Board (Board) issued Recommendation 2004-2, *Active Confinement Systems*, on December 7, 2004. The focus of this Recommendation is to ensure adequate structures, systems, and components are built-in and maintained at defense nuclear facilities to contain or confine radioactive material. The Department of Energy (DOE) accepted the Recommendation on March 18, 2005, acknowledging that active confinement ventilation systems provide added safety benefits and are normally the preferred alternative when confinement of radioactive materials is necessary for protection of the public or collocated workers in case of an abnormal event or accident. The original Implementation Plan for the Recommendation submitted on August 22, 2005, was revised on July 12, 2006, to provide more realistic completion dates for the plan's deliverables. DOE made some progress on meeting its commitments when implementation of the Recommendation began. Work on these important activities has now stagnated. Consequently, DOE is more than 2 years late in meeting several of its commitments and is prolonging implementation of needed safety enhancements. The enclosure lists overdue commitments and describes deviations to DOE's *Ventilation System Evaluation Guidance*.

Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests that DOE provide a report within 60 days of receipt of this letter describing the actions to be taken to complete the delinquent deliverables and remediate deviations from DOE's *Ventilation System Evaluation Guidance* developed in accordance with the Implementation Plan.

Sincerely,

A. J. Eggenberger
Chairman

Enclosure

c: The Honorable Thomas P. D'Agostino
Dr. Inés R. Triay
Mr. Glenn S. Podonsky
Mr. Mark B. Whitaker, Jr.

Enclosure
Implementation of Recommendation 2004-2, Active Confinement Systems

Overdue Commitments. The table below lists overdue commitments from the Recommendation 2004-2 Implementation Plan.

Deliverable No.	Title	Due Date
8.5.5	Develop new or revised guidance in rule or directives for the Department of Energy (DOE)-wide review and comment	November 30, 2006
8.6.3	Evaluation Report for the High Priority Facility (Plutonium Facility at Los Alamos National Laboratory)	December 21, 2006
8.6.3	Site Evaluation Reports for remaining High-Priority National Nuclear Security Administration (NNSA) Facilities	June 5, 2007
8.6.3	Site Evaluation Reports for remaining Medium-Priority NNSA Facilities	September 4, 2007
8.6.3	Site Evaluation Reports for remaining Low-Priority NNSA Facilities	December 3, 2007
8.6.5	Program Secretarial Officer (PSO) approval on Disposition of Gaps for remaining High-Priority NNSA Facilities	September 4, 2007
8.6.5	PSO approval on Disposition of Gaps for remaining Medium-Priority NNSA Facilities	December 3, 2007
8.6.5	PSO approval on Disposition of Gaps for remaining Low-Priority NNSA Facilities	March 2, 2008
8.6.5	PSO approval on Disposition of Gaps for High-Priority Environmental Management (EM) Facilities	September 4, 2007
8.6.5	PSO approval on Disposition of Gaps for Medium-Priority EM Facilities	December 3, 2007
8.6.5	PSO approval on Disposition of Gaps for Low-Priority EM Facilities	March 2, 2008

Deviations from Ventilation System Evaluation Guidance. DOE developed the *Ventilation System Evaluation Guidance* (deliverable 8.5.4 of the Implementation Plan) to define the approach to be taken for the ventilation system evaluations performed in response to Recommendation 2004-2. The Defense Nuclear Facilities Safety Board (Board) has observed the following deviations in the evaluations performed to date:

- Section 5, *System Evaluation*, states that hazard category 2 facilities should perform their evaluation using the following criteria:

- “Hazard category 2 nuclear facilities which challenge or exceed the EG [evaluation guideline] will utilize the SC [safety-class] performance criteria.”
- “All other hazard category 2 nuclear facilities will utilize the SS [safety-significant] performance criteria.”

Several hazard category 2 facilities such as the Annular Core Research Reactor Facility at Sandia National Laboratories and the Radioactive Liquid Waste Treatment Facility at Los Alamos National Laboratory performed their site evaluation gap analysis using “defense-in-depth” performance criteria, which are less stringent than those required for safety-significant and safety-class systems.

- The Site Evaluation Reports identify gaps relative to the performance criteria provided in Table 5.1 of the *Ventilation System Evaluation Guidance*. While corrective actions are not required for gaps relative to discretionary criteria, the Site Evaluation Reports must identify upgrades to address gaps relative to mandatory criteria. As discussed in Section 3.2 of the guidance, *Backfit and Cost/Benefit Considerations*, “the cost/benefit process may be applied for cost-effectiveness purposes to determine which backfit or other strategy is to be implemented to address the gap.” In the Site Evaluation Reports, the cost/benefit analysis is only allowed to determine which upgrade alternative is most cost effective, not whether any modification should be made at all. The decisions on which upgrades to implement are to be made during the next step in the process when the PSO, in coordination with the Central Technical Authority, approves the disposition of gaps and upgrades. This allows the PSOs to review the risks of all of the gaps identified relative to the mandatory criteria, prioritize the upgrades based on their relative costs and benefits, and schedule their implementation based on available funds.

Unfortunately, several of the Site Evaluation Reports have not followed the approach described above, but instead used the cost-benefit analysis to recommend making no upgrades to address gaps relative to mandatory criteria. This is not consistent with the Implementation Plan and inappropriately screens out upgrades to meet mandatory criteria too early in the process. It is the responsibility of the PSO to determine which risks to address or accept, not the field organization (see Section 6 of the guidance, *Determining Cost/Benefit for Recommendation 2004-2 Implementation*). Part of the above problem occurs because some of the Site Evaluation Reports inappropriately identify gaps relative to mandatory criteria as being discretionary. Examples include: Buildings 12-44, 12-116, 12-86, and 12-64 at Pantex and the Defense Waste Processing Facility and F- and H-Evaporator Facilities at the Savannah River Site.