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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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August 5, 2005

The Honorable Samuel W. Bodman
Secretary of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Bodman:

The Defense Nuclear Facilities Safety Board (Board) has reviewed the Department of Energy's (DOE) revised Implementation Plan for Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, dated June 10, 2005. The Board notes with satisfaction the additional detail in the revised plan with respect to the Central Technical Authorities and the Office of Nuclear Safety Research. The plan should result in significant improvement in DOE's oversight of its high-hazard nuclear operations and reduce the likelihood of a nuclear accident.

The Board accepts this plan, on the condition that the *Project Execution Plan to Improve Oversight of Nuclear Operations* (PEP) is modified to address the following issues. Several commitments in the Implementation Plan are identified in the text of Resolution Approaches for various Safety Issue Resolution areas, but are not captured in the numbered commitments of the Implementation Plan or in the tasks listed in the PEP. Other commitments require evaluating activities and processes, culminating in the submission of reports identifying deficiencies, recommendations, or proposed corrective actions; however, neither the Implementation Plan nor the PEP includes tasks or commitments to resolve the deficiencies and implement corrective actions. Additionally, several supporting tasks in the PEP do not achieve the desired results set forth in their associated commitments. A consolidated list of these items is provided in the enclosure to this letter. The Board requests that these commitments and supporting tasks be incorporated into the PEP, and that the responsible PEP Project Manager brief the Board on the revised PEP as soon as practicable.

The Board also wishes to direct senior management attention to the Board's letter of February 14, 2005, which discussed the need for DOE to institute technical qualification requirements for the Central Technical Authorities as a necessary means of sustaining the organizational change described in the Implementation Plan. The Board is adamant regarding the need for technically qualified individuals of the highest caliber to serve as the Central Technical Authorities. The Board strongly encourages the Secretary of Energy to take the necessary steps to implement stringent technical qualification requirements for future appointments to these important safety positions.

In its Implementation Plan, DOE commits to Integrated Safety Management (ISM) “as the foundation of its safety management system and process.” The Board wishes to stress that any changes to the ISM system brought about as a result of the Implementation Plan must not diminish any of the existing ISM requirements or guidance.

As currently structured, the PEP is an extension of the Implementation Plan. However, the Board believes that the change control policy requirements detailed in Section 6.1 of the Implementation Plan should apply to any deletion of tasks from the PEP. The Board will carefully monitor DOE’s progress toward achieving the objectives of this Implementation Plan—improving DOE’s oversight of high-hazard nuclear operations and establishing a highly reliable organization. In particular, key measures of success will include the following:

- The establishment of two Central Technical Authorities, with full staffs of technical experts, who maintain operational awareness of nuclear safety issues in the field.
- The creation of a viable and fully supported nuclear safety research program, providing value-added and timely enhancements to nuclear safety.
- The resurgence of a robust federal oversight program, in which technically qualified line management anticipates and avoids potential safety issues.
- The full realization of Integrated Safety Management that is compatible with quality assurance and nuclear facility safety basis programs.

Sincerely,



A. J. Eggenberger
Chairman

c: Dr. Bruce M. Carnes
Mr. Mark B. Whitaker, Jr.

Enclosure

Enclosure
Recommended Additions to the
Project Execution Plan to Improve Oversight of Nuclear Operations

5.1.1 Instituting Central Technical Authorities

Commitments 2 and 3 specify letter reports to the Secretary of Energy declaring that certain requirements have been met and “providing the basis for this declaration.” The criteria for the bases are discussed in the list immediately preceding the commitments but are not well defined. Individual tasks should be added to the *Project Execution Plan to Improve Oversight of Nuclear Operations* (PEP) that will help achieve and define these bases.

The following item from the text of the Resolution Approach (page 5) should be captured as a task in the PEP: Define the roles, responsibilities, and authorities of the Central Technical Authorities (CTA) in the Safety Research Program (see also the discussion of Section 5.1.3 below).

The following items from the text of the Resolution Approach (page 7) should also be captured as tasks in the PEP:

- Define the detailed functions, responsibilities and authorities for the CTAs.
- Define the technical qualifications of the CTAs and the CTA support staff, including the National Nuclear Security Administration’s (NNSA) Chief of Defense Nuclear Safety (CDNS) and Energy, Science, and Environment’s (ESE) Chief of ESE Nuclear Safety (CENS). Where technical qualifications are not met, corrective or compensatory actions will be taken.
- Define the processes and protocols for fulfilling the CTAs’ roles and responsibilities. For example, the specifics on how and when the CTAs must be involved in the process for granting exemptions to nuclear safety rules and orders need to be defined and finalized, considering existing processes that require approval of the program line managers and the Office of Primary Interest (OPI).
- Describe how the CTAs will interface with other organizations (e.g., Office of Price-Anderson Enforcement, field elements, and program offices). For example, the two CTAs and the Assistant Secretary of Environment, Safety and Health (EH-1) will need to meet periodically to coordinate activities.

5.1.2 Providing Effective Federal Oversight

Commitment 5 addresses the *Department of Energy (DOE) Safety Oversight Manual*. The text preceding the commitments outlines three categories of Criteria and Review Approach Documents (CRADs) to be developed for this manual. However, commitments and schedules for developing these groups of CRADs are not included in either the Implementation Plan or the

PEP. Appropriate tasks should be added to the PEP to require the development of specified categories of CRADs, with definite development priorities and delivery dates being listed. Additionally, issuing the manual with its CRADs in July 2006 may not support the timely oversight reviews identified in Commitment 16 of the Implementation Plan. The Board understands that these CRADs are being developed by a very limited number of personnel, and suggests that DOE invest additional personnel and resources to accelerate this effort.

The Implementation Plan (page 14) states, “Finalization of the DOE [Safety] Oversight Manual will not delay issuance and use of the oversight CRADs.” No task supports this commitment. Therefore, a new task should be added to the PEP to ensure that completed CRADs are published as they are completed.

Additionally, the Implementation Plan (page 14) states, “Existing lines of inquiry and other available review tools for each functional/topical area will be collected from the field following completed reviews. These checklists and lines of inquiry will be validated and provided as guidance....” No task supports this commitment. Therefore, a new task should be added to the PEP to ensure that this feedback loop for CRAD development is developed.

The following items from the text of the Resolution Approach (page 12) should also be captured as tasks in the PEP:

- Establish expectations for ensuring an integrated approach to oversight, including evaluation of the effectiveness of Integrated Safety Management (ISM) during each review area assessment and a balanced emphasis on performance and compliance.
- Establish expectations for developing and executing a Headquarters review/interface process.
- Establish performance metrics for measuring the effectiveness of periodic oversight assessments, such as resolution of oversight findings.

5.1.3 Instituting a Nuclear Safety Research Function

Commitments 7 and 8 specify letter reports to the Secretary declaring that certain requirements have been met and “providing the basis for this declaration.” The criteria for the bases are discussed in the list immediately preceding the commitments but are not well defined. Individual tasks should be added to the PEP that will help achieve and define these bases, including the following:

- Establish and formalize office processes for identifying, prioritizing, selecting, and executing safety-related research and development.
- Describe the interfaces between the nuclear safety research program and other organizations (e.g., Program Secretarial Offices, including the Office of Science; sites; CTAs).

The Implementation Plan (page 16) states that the objectives of the nuclear safety research program will include “advancing the information needed to develop technical directives.” This objective is not adequately discussed in either the Implementation Plan or the PEP. An appropriate grouping of tasks should be added to the PEP regarding the development of effective interfaces with regard to DOE Order 251.1, to ensure that appropriate changes are made to directives affected by research findings. A related task concerns the commitment (page 17) to “identify changes in DOE directives and standards, when appropriate, based on nuclear safety.” This commitment should be included in this grouping.

The following item from the text of the Resolution Approach (page 18) should also be captured as an appropriate grouping of tasks in the PEP: Disseminate nuclear safety research findings.

5.1.4 Establishing Clear Roles, Responsibilities, and Authorities

Commitment 9, Deliverable B, concerns a report to the Secretary that requires the evaluation of review activities; however, the commitment does not include a task or commitment to resolve any identified deficiencies or implement any necessary corrective actions. Timely correction/disposition of identified deficiencies by senior management using adequate resources is an attribute of high-reliability organizations. Appropriate tasks should be added to the PEP to (1) resolve any identified deficiencies; (2) implement corrective actions or recommendations, with the appropriate senior management involvement and resources to achieve successful closure; and (3) follow up and verify effectiveness of the corrective actions.

5.1.5 Ensuring Technical Capability and Capacity to Fulfill Safety Responsibilities

There are no supporting tasks in the PEP associated with the latter portion of Commitment 11, “a plan for implementing this concept and a mechanism for maintaining the list.” Appropriate tasks should be added.

In the Resolution Approach (page 24), the Implementation Plan states that when DOE identifies experienced and technically capable personnel, “these persons will assist the Department in improving overall technical capability.” This statement is not supported by a commitment in the Implementation Plan or a task in the PEP. The PEP should include a grouping of tasks to define the role of these personnel and then implement that role, followed by verification of the effectiveness of the tasks.

Similarly, DOE commits to the evolution of Nuclear Executive Leadership Training (page 25) “into an institutionalized leadership and development program.” Although the PEP tasks supporting Commitment 12 indicate that DOE will “complete training and assess effectiveness” (line 162), there are no tasks designed to institutionalize and sustain the training. A grouping of tasks to support these goals should be added to the PEP.

The deliverable associated with Commitment 12 does not meet the requirements of the commitment. The requirement is to provide structured training for safety professionals, senior managers, and decision makers. The deliverable discussed addresses only Nuclear Executive Leadership Training. Appropriate groupings of tasks should be added to the PEP to develop the entire suite of structured training for all of these important classes of personnel.

Under Commitment 14, DOE will appoint an emeritus-level panel, which will then make recommendations. However, neither the Implementation Plan nor the PEP provides for implementation of any of these recommendations. An appropriate grouping of tasks should be added to the PEP to resolve and close out recommendations from the emeritus-level panel.

The PEP tasks supporting Commitment 14 are focused on oversight personnel. However, the commitment should address all personnel with federal safety assurance responsibilities. Tasks should be added to the PEP to support this broader range of personnel.

The following items from the text of the Resolution Approach (page 26) should also be captured as tasks in the PEP:

- Provide new and reassigned personnel the training and mentoring necessary to fulfill their safety responsibilities.
- Assign appropriate technical qualification standards to the identified federal safety assurance personnel and individual objectives for completing qualifications.
- Identified individuals will complete technical qualifications to identified standards.

5.1.6 Verification of Federal Safety Assurance Capability

The PEP tasks supporting Commitment 16 do not require interim oversight reviews. Should there be issues requiring resolution, January 2008 may be too long to wait to implement the necessary changes. Tasks for interim sampling should be added to the PEP.

The following item from the text of the Resolution Approach (page 28) should also be captured as an appropriate grouping of tasks in the PEP: A review plan with CRADs will be developed to guide the review. Follow-on verification activities will be performed as necessary to determine when objectives have been successfully institutionalized and whether additional improvement opportunities exist.

5.2.1 Department-wide Action Plan for Columbia and Davis-Besse Events

In its acceptance letter of July 21, 2004, DOE emphasized that the Columbia accident and Davis-Besse incident would provide valuable lessons learned as key inputs in developing the Implementation Plan for Recommendation 2004-1. DOE may have only partially achieved this objective. Some lessons derived from these events were developed too late to influence the

commitments in the Implementation Plan and are being handled in a separate corrective action plan. These two efforts need to be closely coordinated. Pertinent lessons from this separate effort should be incorporated into the PEP in such a fashion as to assist in the resolution of the appropriate commitments in the Implementation Plan.

5.2.2 Comprehensive Operating Experience Program

Commitment 17 involves developing an action plan related to the Columbia and Davis-Besse events. Commitments 18 and 19 involve developing and implementing a DOE Operating Experience Program. However, in the interval before complete implementation of the Operating Experience Program (projected by July 2007), other major external events that represent valuable lessons applicable to DOE may occur. Appropriate tasks should be added to the PEP to ensure that lessons from such events (e.g., the fire at British Petroleum's Texas City refinery and the pipe break in the Thermal Oxide Reprocessing Plant at Sellafield) are identified, analyzed, disseminated, and acted upon throughout the complex.

5.2.3 Verification of Implementation of Operating Experience

Commitment 20 specifies a report to the Secretary verifying the effectiveness of the implementation of Operating Experience Program; however, the commitment does not include a task or commitment to resolve any identified deficiencies or implement any necessary corrective actions. Appropriate tasks should be added to the PEP to (1) resolve any identified deficiencies; (2) implement corrective actions or recommendations with the appropriate senior management involvement and resources to achieve successful closure; and (3) follow up and verify the effectiveness of the corrective actions.

5.3.1 Enhancing ISM Implementation at DOE Headquarters and Field Offices

The purpose of Commitment 21, Deliverable B, is not clear. Appropriate supporting tasks should be added to the PEP to define and track the actions expected as an outcome of the decision specified in the commitment.

The following items from the text of the Resolution Approach (page 37) should also be captured as tasks in the PEP:

- Clearly establishing ISM champions within all DOE program and field offices.
- Establishing an ISM working group supporting the champions in leading ISM reinvigoration.
- Conducting workshops for communicating vision and expectations, sharing guidance, exchanging lessons learned and good practices, and developing consensus work products.

- Developing an action plan to address the findings from the Idaho ISM workshop of August 2002.
- Reviewing implementation experience after DOE organizations issue ISM System Descriptions to determine whether there is a need to revise the expectations, provide new training or guidance, or take other actions for improvement.

5.3.2 Work Planning and Work Control Processes at the Activity Level

Commitment 24 specifies a series of oversight reports by DOE Headquarters line oversight on work planning and work control; however, the commitment does not include a task or commitment to resolve any identified deficiencies or implement any necessary corrective actions. Appropriate tasks should be added to the PEP to (1) resolve any identified deficiencies; (2) implement corrective actions or recommendations, with the appropriate senior management involvement and resources to achieve successful closure; and (3) follow up and verify the effectiveness of the corrective actions.

5.3.3 Integration and Use of Feedback Mechanisms to Produce Improvement

The PEP task (line 285) associated with Commitment 25 does not match the deliverable and appears to be mislabeled.

In the PEP tasks supporting Commitment 26, the requirement to provide midcourse direction appears to be met with respect to ESE, but not with respect to NNSA. Tasks should be added to the PEP to ensure that all of DOE meets this commitment.

5.3.4 ISM Verification

The Implementation Plan states, “Full ISM verifications are envisioned to occur at least every 5 years. More frequent full verifications may be appropriate where significant system or performance weaknesses are identified.” An appropriate grouping of tasks should be included in the PEP to support this important commitment.

Commitment 27 specifies reports on comprehensive ISM reviews at two major sites; however, the commitment does not include a task or commitment to resolve any identified deficiencies or implement any corrective actions. Appropriate tasks should be added to the PEP to (1) resolve any identified deficiencies; (2) implement corrective actions or recommendations, with the appropriate senior management involvement and resources to achieve successful closure; and (3) follow up and verify the effectiveness of the corrective actions.

6.2 Reporting

Given the importance of the PEP to the successful execution of the Implementation Plan and the fact that DOE may be exercising its discretion to add PEP tasks or adjust PEP delivery dates, an updated PEP should be provided to the Board concurrent with DOE’s periodic briefings. This commitment should also be added to the PEP.