

A.J. Eggenberger, Chairman
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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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August 16, 2006

The Honorable Linton Brooks
Administrator
National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Ambassador Brooks:

The Defense Nuclear Facilities Safety Board (Board) received the Department of Energy's (DOE) letter dated May 1, 2006, transmitting the draft DOE-NA-STD-3016-2006, *Preparation Guide for U.S. Department of Energy Nuclear Explosive Operation Hazard Analysis Reports*. This standard was intended to address Commitment 4.2.2 of the Implementation Plan for the Board's Recommendation 98-2, *Safety Management of the Pantex Plant*. Commitment 4.2.2 addressed the need to promulgate further guidance on expectations for the evaluation and documentation of weapon response to potential accident environments and stimuli. While the draft standard represented an improvement over the current standard and the supplemental directive it was intended to replace, it still fell short of meeting the intent of the Recommendation in the area of weapon response.

The Board's staff provided formal comments on the standard on May 17, 2006, and received the National Nuclear Security Administration's (NNSA) formal response on May 25, 2006. Discussions with NNSA have resolved some issues. The principal issue on which agreement could not be reached concerns the level of detail and specificity provided in the standard for weapon response development, as well as for the overall process for preparation of Hazard Analysis Reports (HARs). The standard, cited as a "safe harbor" for meeting the requirements of Title 10, U.S. Code of Federal Regulations, Part 830, *Nuclear Safety Management*, was issued in May 2006 without resolution of this principal safety issue.

The methodology of a safe harbor standard should be clearly and adequately defined. Without a detailed methodology, it will not be clear how an analyst is to satisfy the intent of the safe harbor. Also, in cases where an analyst chooses an alternate method of analysis, the detailed methodology of the safe harbor serves as a basis for measuring the adequacy of the alternate approach. Key areas in which DOE-NA-STD-3016-2006 fails to meet this expectation are summarized in the enclosure to this letter.

The Board believes that the published standard does not provide the detailed guidance needed to fulfill Commitment 4.2.2 of the Implementation Plan for Recommendation 98-2. Therefore, the Board finds this deliverable does not meet the intent of Recommendation 98-2 and will consider this commitment open until such time as the issues in this letter and its enclosure have been adequately resolved. The Board requests to be briefed within 30 days of receipt of this letter on NNSA's path forward to resolve these issues.

Sincerely,

A handwritten signature in black ink, appearing to read "A. J. Eggenberger". The signature is written in a cursive style with a large, sweeping "A" and "E".

A. J. Eggenberger
Chairman

c: Mr. Mark B. Whitaker, Jr.
Mr. Richard M. Stark

Enclosure

Enclosure

Comments of the Defense Nuclear Facilities Safety Board's Staff on DOE-NA-STD-3016-2006, *Preparation Guide for U.S. Department of Energy Nuclear Explosive Operation Hazard Analysis Reports*

1. Many of the comments of the Defense Nuclear Facilities Safety Board's (Board) staff are related to the level of detail and specificity provided in the standard. The National Nuclear Security Administration (NNSA) views the standard's lack of specificity as acceptable, and believes the standard could possibly be supplemented by future technical business practices. In addition, NNSA contends that since the approval authority could reject documents that did not meet expectations, there is no need for specificity in the standard. The Board's staff contends that a safe harbor needs to define at least one acceptable approach for meeting the requirements in the nuclear safety rule. Such an approach can help ensure safety, save time, and prevent costly mistakes, particularly in those cases in which NNSA's reviewers or contractor personnel who prepare the reports may not be expert in their respective areas of responsibility. This benefit is especially important since NNSA's technical capability has been a particularly intractable problem. The following are examples of the detail needed in this standard:
 - a. NNSA has stated its intent to increase their use of broad weapon response "rules" to provide more operational flexibility at Pantex. However, the standard does not provide a description of such rules, how they are to be developed, and how they are to be used. Without such guidance, there is a substantial risk that adequate controls will not be identified for all scenarios. Without an adequate description of the weapon response rules, it is also unclear whether a distinction is maintained between different scenarios that make use of a common weapon response rule.
 - b. There is inadequate guidance on the construction or content of Screening Tables. This guidance used to be provided in Chapter 11.8 of the Development and Production (D&P) Manual. Since that chapter has been removed, it is not clear what mechanism defines acceptable content for Screening Tables.
 - c. The guidance on expert elicitation and peer review directs the design agencies to follow their local procedures, which are part of their quality assurance programs and peer review processes. Since there are three different design agencies, significant variability in the quality of the weapon response products could result. No criteria are presented that would define acceptable expert elicitation and peer review. A criterion should be established that describes, or references, an acceptable methodology for the expert elicitation and peer review processes.
 - d. Since the formal process defined in Chapter 11.4 of the D&P Manual for using weapon response data has been canceled, it is not clear how the design agencies will work with the Pantex Plant contractor to ensure appropriate use of their weapon response information. A process needs to be more explicitly defined whereby the design agency ensures the appropriate use of weapon response information in the HAR.

- e. There is inadequate guidance on determining the effectiveness of controls since Chapter 11.8 of the D&P Manual has been removed. Previously, the D&P Manual required that when a safety function discussed in the Documented Safety Analysis was relied upon to reduce the severity of the insult, a new weapon response would have to be determined. The new standard only requires a *qualitative* analysis of the effectiveness of controls. It is prudent to focus on controls that simply eliminate a hazard or insult. The effectiveness of these type controls can generally be adequately assessed using qualitative analysis. However, the complexity of weapon responses to insult does not always lend itself to qualitative analysis. In cases where a control functions to mitigate the severity of an insult, a new weapon response determined by the design agency would ascertain the effectiveness of such controls with greater certainty.
2. The methodology for probabilistic calculations in Section 8 of the standard appears to discourage efforts to better understand accident phenomena, and has the effect of freezing the current state of knowledge. The methodology also does not encourage the best use of available data.
3. The Nevada Test Site has a continuing mission for handling damaged weapons and must maintain the capability to resume underground testing if directed. The standard should make it clear that the term Production Plant Contractor is applicable to both the Pantex Plant and the Nevada Test Site.
4. The process described in the standard on how to deal with emerging information essentially continues the status quo in this area, which has led to confusion and delays at the Pantex Plant in recent years. As stated in the standard, "Once DA management has determined that the information is developed enough to require action and is applicable to production plant operations, the information must be formally transmitted from the DA to the PPC utilizing the Engineering Authorization System, or equivalent." NNSA ought to explore methods to strengthen this process of determination by the DA, including the possible use of a panel of subject matter experts drawn along the lines of the current process for significant finding investigations. For example, recent weapon aging issues should have been formally communicated to the PPC earlier, which may have prevented SS-21 implementation delays and corresponding NNSA decisions to request additional Title 10, U.S. Code of Federal Regulations, Part 830, *Nuclear Safety Management* exemptions.