

Sean Sullivan, Chairman
Bruce Hamilton, Vice Chairman
Jessie H. Roberson
Daniel J. Santos
Joyce L. Connery

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



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

Dear Administrator Klotz:

The Defense Nuclear Facilities Safety Board reviewed Lawrence Livermore National Laboratory's weapon response technical basis (WRTB) documentation for the W80 weapon program. The W80 WRTB documentation provides a solid technical foundation for the development of the W80 weapon response summary document, and ultimately, development of the Pantex Plant W80 safety basis.

The enclosed staff report identifies opportunities for improvement and is provided for your information.

Yours truly,

Sean Sullivan
Chairman

Enclosure

c: Mr. Joe Olencz

Enclosure

Review of the W80 Weapon Response Technical Basis

In 2016, the Defense Nuclear Facilities Safety Board (Board) directed its staff to develop a plan to review the weapon response technical basis (WRTB) documentation process at the design agencies. For its first review under this initiative, the staff reviewed the W80 WRTB documentation at Lawrence Livermore National Laboratory (LLNL) from March 7–9, 2017.

The staff found that the W80 WRTB documentation was thorough, well documented, and provided a solid technical foundation for development of the W80 weapon response summary document. The staff conducted an initial out-brief with applicable LLNL weapon response staff on March 9, 2017, and a follow-on closeout brief with LLNL and NNSA's Livermore Field Office personnel on April 18, 2017.

The staff found no deficient safety conclusions in the WRTB or the summary document. Based on a focused review of documents, primarily pertaining to the W80 weapon response, the staff found that the LLNL *Weapon Response Process*¹ effectively implemented the requirements of DOE Standard 3016-2006, *Hazard Analysis Reports for Nuclear Explosive Operations*, and that the W80 weapon response appropriately adhered to these requirements.

Opportunities for improvement in the LLNL *Weapon Response Process* include:

- The LLNL *Weapon Response Process* includes guidance to weapon response personnel to include all design agencies on distribution for new weapon response information so that they can evaluate the potential applicability to other systems/components. However, the guidance is limited, does not discuss the process LLNL should use to evaluate other design agency weapon responses for applicability to LLNL systems/components, and does not explicitly include guidance on how LLNL should evaluate applicability of LLNL weapon response to other LLNL systems/components (i.e., extent of condition).
- While the LLNL *Weapon Response Process* includes guidance on the treatment of safety-related new information developed by LLNL, it does not include guidance on how weapon response personnel and LLNL management should evaluate the maturity of new information or criteria for determining when new information is actionable. DOE Standard 3016-2006 is very clear about the Design Agency (LLNL in this case) formally transmitting mature new information to the Pantex Plant, and the LLNL document specifies how this should be accomplished. However, the overall process

¹ Weapon and Complex Integration Quality Implementing Procedure, *Weapon Response Process*, ELM-U-1000857325-AA, March 2016.

is subjective because neither the DOE standard nor the LLNL *Weapon Response Process* contain criteria for determining when new information is mature. Without clear guidance to Laboratory personnel, it is possible for the Pantex Plant to be operating with additional risk while weapon response determinations are made.

During the review, the staff also identified the following opportunities for improvement in the WRTB documentation and encouraged LLNL personnel to consider them during their next revision, or when implementing the recently updated DOE Standard 3016–2016, scheduled to occur later in 2017.

- In one instance, the electrical WRTB documentation identified a potential high explosive heating accident scenario, but did not fully develop the scenario or carry it over to the mechanical and thermal WRTB documentation.
- One WRTB document contained several inappropriate references, including a draft manuscript that was used to justify fundamental conclusions. LLNL personnel previously had identified this deficiency and entered it into the appropriate local issues tracking system for resolution.
- The peer-review process can be improved by elaborating on the disposition of comments in the review comment record, further strengthening the peer-review process to focus on technical inconsistencies as well as errors, and modifying the peer-review checklist.
- Further elaboration and development could improve a number of expert judgments (e.g., additional support and reasoning for the judgment, such as the use of safety factors, and inclusion of this data in the technical basis rather than just addressing it in the review comment record).
- The Board's staff found inconsistencies in the WRTB documentation including assumptions pertaining to falling man analysis, use of the Pantex revised electrostatic discharge (ESD) distribution during ESD calculations, and a finite element analysis that was inconsistently referenced. However, the staff did not find instances where these inconsistencies would result in changes to the technical conclusion.

AFFIRMATION OF BOARD VOTING RECORD

SUBJECT: W80 LLNL WRTB Letter

Doc Control#2017-100-084


The Board, with Board Member(s) Sean Sullivan, Bruce Hamilton, Joyce L. Connery *approving*, Board Member(s) Jessie H. Roberson, Daniel J. Santos *disapproving*, Board Member(s) none *abstaining*, and Board Member(s) none *not participating*, have voted to approve the above document on October 27, 2017.

The votes were recorded as:

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIPATING*	COMMENT	DATE
Sean Sullivan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/25/17
Bruce Hamilton	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/25/17
Jessie H. Roberson	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10/27/17
Daniel J. Santos	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/25/17
Joyce L. Connery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10/26/17

*Reason for Not Participating:

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Board Members.


Executive Secretary to the Board

Attachments:

1. Voting Summary
2. Board Member Vote Sheets

cc: Board Members
OGC
OGM Records Officer
OTD

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET

FROM: Sean Sullivan

SUBJECT: W80 LLNL WRTB Letter

Doc Control#2017-100-084

Approved *P* **Disapproved** **Abstain**

Recusal – Not Participating

COMMENTS: **Below** **Attached** **None** *P*



Sean Sullivan

 10/25/17

Date

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET**

FROM: Bruce Hamilton

SUBJECT: W80 LLNL WRTB Letter

Doc Control#2017-100-084

Approved X **Disapproved** _____ **Abstain** _____

Recusal – Not Participating _____

COMMENTS: **Below** _____ **Attached** _____ **None** X _____

H. Shelby Qualls for

Bruce Hamilton

10.25.17

Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET

FROM: Jessie H. Roberson

SUBJECT: W80 LLNL WRTB Letter
Doc Control#2017-100-084

Approved _____ Disapproved X Abstain _____


Recusal – Not Participating _____

COMMENTS: Below X Attached _____ None _____

I do not support the referenced letter. The Board is provided statutory authority to access atomic weapons information in the DOE that is needed for the Board to carry out its statutory functions. I have not supported previous Board actions in this area because they lacked adequate structure to preclude drifting toward a Board jurisdictional assumption of and execution of oversight of atomic weapons safety, which is statutorily excluded from the Board's jurisdiction.

The passage added to the statute by Section 3202 (b)(2)(B) of the National Defense Authorization Act for FY 1992 and FY 1993, Pub. L. No. 102-190: "The functions of the Board under this subchapter do not include functions relating to the safety of atomic weapons. However, the Board shall have access to any information on atomic weapons that is within the Department of Energy and is necessary to carry out the functions of the Board."

The referenced letter provides feedback to the NNSA Administrator regarding the Board's staff evaluation of weapons information and its conclusions relative to those functions statutorily assigned to the Board but then proceeds beyond the Board's statutory authority.



Jessie H. Roberson
October 27, 2017

Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET

FROM: Daniel J. Santos

SUBJECT: W80 LLNL WRTB Letter

Doc Control#2017-100-084

Approved _____ Disapproved Abstain _____

Recusal – Not Participating _____

COMMENTS: Below _____ Attached _____ None



Daniel J. Santos

Date

10/25/17

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET**

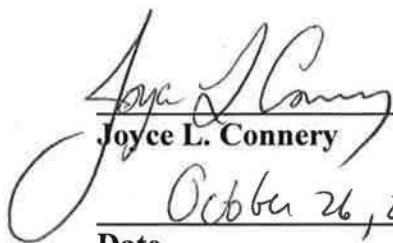
FROM: Joyce L. Connery

SUBJECT: W80 LLNL WRTB Letter

Doc Control#2017-100-084

Approved Disapproved Abstain
Recusal – Not Participating

COMMENTS: Below Attached None



Joyce L. Connery
October 26, 2017

Date