

AFFIRMATION OF BOARD VOTING RECORD

SUBJECT: Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant

Doc Control#2015-149

The Board, with Board Member(s) Joyce L. Connery, Jessie H. Roberson, Daniel J. Santos, Bruce Hamilton *approving*, Board Member(s) Sean Sullivan *disapproving*, Board Member(s) none *abstaining*, and Board Member(s) none *recusing*, have voted to approve the above document on January 20, 2016.

The votes were recorded as:

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIPATING*	COMMENT	DATE
Joyce L. Connery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01/20/16
Jessie H. Roberson	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01/13/16
Sean Sullivan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	01/15/16
Daniel J. Santos	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01/13/16
Bruce Hamilton	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01/12/16

*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: Joyce L. Connery

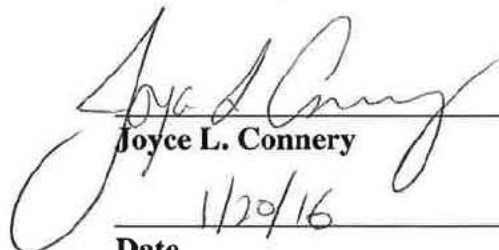
SUBJECT: Plugging and Wear of Process Piping at the Waste Treatment and
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Doc Control#2015-149

Approved **Disapproved** **Abstain**

Recusal - Not Participating

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



Joyce L. Connery

1/20/16
Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD
NOTATIONAL VOTE RESPONSE SHEET


FROM: Jessie H. Roberson

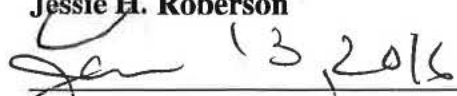
SUBJECT: Plugging and Wear of Process Piping at the Waste Treatment and
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Doc Control#2015-149

Approved Disapproved _____ Abstain _____
Recusal - Not Participating _____

COMMENTS: Below _____ Attached _____ None



Jessie H. Roberson


Date

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

NOTATIONAL VOTE RESPONSE SHEET

FROM: Sean Sullivan

SUBJECT: Plugging and Wear of Process Piping at the Waste Treatment and
Immobilization Plant

Doc Control#2015-149

Approved _____ Disapproved X Abstain _____

Recusal – Not Participating _____

COMMENTS: Below X Attached _____ None _____

I object to the technical report because it advises the establishment of stringent design criteria “whenever feasible” without presenting an adequate justification, incorrectly infers that support for that advice can be found in DOE directives, and significantly overplays the safety risk involved.

The technical report advises the establishment of criteria to ensure “a turbulent or homogeneous laminar flow regime throughout the plant whenever feasible.” The word “feasible” means “capable of being done.” (Merriam-Webster) The report doesn’t expressly say “whenever technically feasible,” but I interpret it that way, given that it is presented as a *technical report*. Further, the executive summary declares the current design to be deficient because the “proposed target transport velocity of 6 feet per second for the non-Newtonian transfer line design strategy *lacks the technical basis* to establish it is adequate to avoid solids settling and, thus, to avoid pipeline plugging.” (emphasis added) Thus, in context, I read the words “whenever feasible” as advising stringent criteria whenever technically feasible. There is no justification for advising such stringent criteria. It makes no sense for DOE to instruct its contractor as this report advises.

Our staff presented to us a professional reference regarding hierarchy of controls strategies for design projects. That reference was said to support the contention that technical problems should be eliminated through design whenever feasible. But that professional author’s discussion of the strategy duly noted that design decisions were inherently complex and involved numerous tradeoffs. That author never indicated one control strategy was automatically superior to another based on technical considerations alone. In fact, cost considerations were recognized as a significant factor in all design decisions. As discussed in my vote on the amendments made to this report, I believe that it is inappropriate for us to suggest that DOE do something when lesser measures would be entirely satisfactory from a nuclear safety standpoint. It is one thing to say ‘consider doing it even better,’ and quite another to advise ‘do it if technically feasible.’ Our enabling statute requires us to consider economic feasibility when making formal recommendations. While this report is not a ‘recommendation’ as that term is used in our statute, it nevertheless advises DOE to do something. Why wouldn’t we appropriately consider economic feasibility for this? Why imply that DOE should take the ultra-conservative option, even if it is economically not feasible?

ARCHIVE: Doc#2015-149 Plugging and Wear of Process Piping
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Also as discussed in my vote on the amendments, I find no support in DOE directives for what is written in this report, and therefore I find it misleading to suggest that such support exists.

Finally, the report significantly overplays the safety issues involved. The report discusses centrifugal pump explosions potentially piercing primary containment boundaries. But for a pump to explode, both the inlet and outlet of a pump must become blocked and the pump must run – with no flow and no one noticing the no flow condition – for a significant length of time. The report points to pump explosions in the mining industry. However, I am not aware of sufficient mining accident reports that provide the necessary details needed to determine whether the situation at WTP might be analogous to that of any mining accident. Details such as slurry composition, system flush requirements (or lack thereof), system flow rate monitoring (or lack thereof), system operating history (e.g., perhaps mining industry pipes filled with slurry were allowed to sit idle for long periods of time, facilitating settling and solidification). Without such details, I am unconvinced that the situations are analogous.

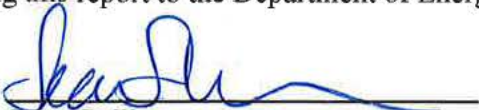
There is one report I was able to read. That report is listed as reference 7 in the report. It is available at <http://www.msha.gov/FATALS/2002/FTL02c03.HTM>

In this 2002 Virginia mining accident, a pump was moving slurry in a system vertically upwards (described as pump on first floor, pumping to the third floor). The discharge line became blocked with slurry fines. The pump shaft had a water-cooled mechanical seal with known leakage, allowing water to enter the volute. The pump was operated for 35 minutes with no flow. Water introduced into the volute turned to steam. Thermodynamic calculations done by the investigating team showed that the pressure should not have exceeded the rated casing pressure, but welding defects on the pump cover plate had weakened it.

These details are significant, and there is no reason to expect that conditions at WTP will be analogous to the Virginia mining accident. The only similarities are: 1) slurry and 2) centrifugal pump. Otherwise, everything is different.

Preventing centrifugal pump explosion is a simple proposition: maintain flow. Any flow will do. Six fps, 6000 fps, or six inches per second – doesn't matter. As long as flow is greater than zero, the pump will not explode because there is a path available to dissipate any excess pressure. The current design anticipates 6 fps flow. That should be sufficient, and this report does not explain why it is not. Moreover, since WTP will be drawing slurry from a tank located at one of the Hanford tank farms, measures to monitor 6 fps and prompt appropriate remedial action can occur at the suction within the source tank or somewhere else in the tank farm. Therefore, it is possible to safeguard against WTP pump explosions from the tank farms, in which case nothing at all needs to be done with the WTP design.

For all of the above reasons, I do not support sending this report to the Department of Energy.


Sean Sullivan
1/15/16
Date

Lotus Smith

From: Daniel J. Santos
Sent: Wednesday, January 13, 2016 11:14 AM
To: Lotus Smith; Shelby Qualls
Subject: RE: Doc#2015-149 Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant Blue Folder

Approved without comments.

From: Lotus Smith
Sent: Tuesday, January 12, 2016 3:23 PM
To: Bruce Hamilton; Daniel J. Santos; Jessie Roberson; Joyce Connery; Sean Sullivan
Cc: Lotus Smith; Nora Khalil; Shelby Qualls
Subject: Doc#2015-149 Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant Blue Folder

This email is an electronic record of Notational Vote. Voting ballot will follow shortly. Also, accepting electronic votes.

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

FROM: Members of the Board
SUBJECT: Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant

DOC#2015-149

Both approved amendments, Doc#2015-149A and Doc#2015-149B have been incorporated in this final version. Both RLSO versions of the cover letter and technical report are attached to see the changes made to reflect approved amendments.

Approved _____
Disapproved _____
Abstain _____
Recusal – Not Participating _____

COMMENTS:

Below _____
Attached _____
None _____

Lotus Smith
Executive Secretary
Office of the Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Ave, NW, STE 700
Washington, DC 20004

Shelby Qualls

From: Bruce Hamilton
Sent: Tuesday, January 12, 2016 8:17 PM
To: Lotus Smith
Cc: Shelby Qualls
Subject: Re: Doc#2015-149 Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant Blue Folder

I approve.
I have no comments.

From: Lotus Smith
Sent: Tuesday, January 12, 2016 3:23 PM
To: Bruce Hamilton; Daniel J. Santos; Jessie Roberson; Joyce Connery; Sean Sullivan
Cc: Lotus Smith; Nora Khalil; Shelby Qualls
Subject: Doc#2015-149 Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant Blue Folder

This email is an electronic record of Notational Vote. Voting ballot will follow shortly. Also, accepting electronic votes.

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

FROM: Members of the Board
TO: Plugging and Wear of Process Piping at the Waste Treatment and Immobilization Plant

5-149

Both approved amendments, Doc#2015-149A and Doc#2015-149B have been incorporated in this final version. Both RLSO versions of the cover letter and technical report are attached to see the changes made to reflect approved amendments.

red_____

Not Participating_____

NTS:

None_____

Lotus Smith
Executive Secretary