



Department of Energy

Idaho Operations Office
West Valley Project Office
P.O. Box 191
West Valley, NY 14171

March 4, 1992

M-32
PDR/LPDR

Mr. G. C. Comfort
U.S. Nuclear Regulatory Commission
Headquarters
Washington, DC 20555

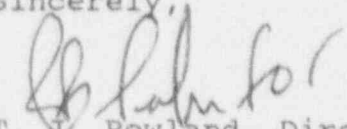
SUBJECT: West Valley Demonstration Project (WVDP) Responses
to NRC Recommendations Made in the Supernatant
Treatment System Safety Evaluation Report

Dear Mr. Comfort:

Enclosed for your information are responses to the recommendations made in the NRC's Safety Evaluation Report of the WVDP's Supernatant Treatment System.

If you have any comments or questions, please contact
R. B. Provencher of my staff at FTS 473-4101.

Sincerely,


T. S. Rowland, Director
West Valley Project Office

Enclosure: Responses

cc: J. L. Lyle, DOE-ID (w/o enc)
T. W. McIntosh, DOE-HQ (w/o enc)

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RESPONSES TO NRC SER ON STS SAR (REV. 6)

No.	NRC SER Suggestion	WVNS' Response
1	<p>Pg. 5, paragraph 5, sentence 4 - "The NRC expects DOE to accurately measure, record, and report the Pu levels in the wash solution and STS treated water, and to ascertain when its removal becomes necessary to prevent transport to the LWTS."</p> <p>Pg. 23, paragraph 5, sentence 4 - "The NRC expects DOE to accurately measure, record, and report plutonium levels in the wash solution and STS treated water, and to ascertain when its removal becomes necessary to prevent transport to the LWTS."</p>	<p>Technical Requirement (TR)-IRTS-12 requires measurement, tracking and recording of the Pu concentration in the STS solution prior to transfer to the LWTS. TR-IRTS-11 requires measurement, tracking and recording of the LWTS feed prior to the evaporator.</p>
2	<p>Pg. 14, paragraph 3, sentence 2 - "Since any leakage of the sludge along the shaft will result in contamination of the shaft and inner walls of the pump (sludge mobilization pump), the manner and frequency of the monitoring process should be clearly described."</p>	<p>Table D.6.5-1 indicates that individual pump enclosures contain radiation detection instrumentation. The radiation detectors monitor the pump column for radioactive contamination. High exposure rate activates the external pump enclosure visual alarm and horn.</p>

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3	<p>Pg. 14, paragraph 5, sentence 4 - "... however, the specific type of coupons and the degree to which corrosion coupons are stressed are important and should be reported along with qualitative results."</p> <p>Pg. 14, paragraph 5, sentence 5 - "... additional efforts to monitor the potential for corrosion are justified to assure the safety of the tanks."</p> <p>Pg. 15, paragraph 1, sentence 2 - "Similar quantitative results should be given to indicate that pitting will not be a problem."</p> <p>Pg. 15, paragraph 1, sentence 3 - "Additional efforts are justified to monitor the potential for the three major types of corrosion (wall thinning, concentrated pitting, and stress corrosion cracking) on the carbon steel tank material."</p> <p>Pg. 23, paragraph 6, sentence 2 - "However, activities to monitor the three types of corrosion are encouraged."</p>	<p>Internal corrosion of tank 8D-1 is assessed by the use of two corrosion coupon racks (inside the tank) which contain various types of coupons. One of these racks rests on the tank floor or on the zeolite covering the tank floor. Coupons on this rack indicate corrosion activity in the liquid/zeolite region of the tank. The other coupon rack floats at the liquid-to-vapor interface and coupons are located on the rack to provide corrosion data for the liquid, the vapor and the liquid-vapor interface regions. The coupons listed below provide data that are used to assess general corrosion (wall thinning), concentrated pitting, stress corrosion cracking and crevice corrosion.</p> <table><thead><tr><th>Type Coupon</th><th colspan="5">Location</th></tr><tr><th></th><th>Vap.</th><th>Liq.</th><th>V/L</th><th>Zeolite</th><th>Total</th></tr></thead><tbody><tr><td>Plain Coupon</td><td>2</td><td>4</td><td>1</td><td>4</td><td>11</td></tr><tr><td>Crevice Coupon</td><td>2</td><td>4</td><td>1</td><td>4</td><td>11</td></tr><tr><td>U-bend</td><td>2</td><td>3</td><td>0</td><td>3</td><td>8</td></tr><tr><td>Double U-bend</td><td>0</td><td>2</td><td>0</td><td>2</td><td>4</td></tr><tr><td>CT Specimen</td><td>2</td><td>2</td><td>0</td><td>4</td><td>8</td></tr><tr><td>Archive Coupon</td><td>0</td><td>0</td><td>0</td><td>0</td><td>2</td></tr></tbody></table> <p>Corrosion data were obtained from coupon examination after nine months of exposure inside tank 8D-1 from December 1988 to September 1989. Results indicate that the vapor phase was most corrosive with an average general corrosion rate of 0.78 mils/yr and a maximum of 1.2 ils/yr. General corrosion in the zeolite and liquid regions averaged 0.62 mils/yr and 0.07 mils/yr, respectively.</p>	Type Coupon	Location						Vap.	Liq.	V/L	Zeolite	Total	Plain Coupon	2	4	1	4	11	Crevice Coupon	2	4	1	4	11	U-bend	2	3	0	3	8	Double U-bend	0	2	0	2	4	CT Specimen	2	2	0	4	8	Archive Coupon	0	0	0	0	2
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3 cont		<p>Significant pitting was observed on the coupons in the zeolite region. However, the depth of the pitting could not be accurately measured. A pitting corrosion inhibitor has been subsequently added to the tank. Action will be taken to quantify pitting depths during future coupon examination.</p> <p>Stress corrosion cracking and crevice corrosion were not detected by coupon examination. Stress corrosion cracking in tank 8D-1 is assessed by examination of U-bend corrosion coupons in the various regions of the tank. U-bend coupons are designed and fabricated to ASTM-G30 requirements.</p> <p>Pitting corrosion is being measured by corrosion coupons in tank 8D-1. The only significant pitting corrosion is present in the zeolite region of the tank. Examination of coupons submerged in the zeolite at the bottom of the tank indicate that a localized pitting corrosion of up to a maximum of 4.06 mils/yr may have been present prior to addition of the pitting corrosion inhibitor (sodium nitrate) to the tank. The rate of pitting will be assessed in mid-1992 when the coupons will be removed again for examination.</p> <p>Corrosion data from tank 8D-2 have been unavailable since the NFS coupons were removed from the tank in 1982. These coupons indicated a general corrosion rate of 0.53 mils/yr for the liquid region.</p>

No.	NRC SER Suggestion	WVNS' Response
3 cont		<p>In October 1991, a series of corrosion probes were installed into tank 8D-2 to measure actual corrosion rates. These probes are advantageous in that the time required for frequent corrosion coupon removal, cleaning, examination and reinstallation is greatly reduced. The probes provide on-line indication of general tank corrosion in all three regions: sludge, liquid and vapor. During the limited period of time these probes have been operating, general corrosion rate indications have been:</p> <p>3.2 mils/yr in the sludge region</p> <p>0.3 mils/yr in the liquid region</p> <p>1.9 mils/yr in the vapor region</p> <p>In addition, 0.2 mils/yr pitting corrosion in the liquid region is indicated by the pitting corrosion probe. The WVDP is currently assessing the need and feasibility of installing corrosion coupons into tank 8D-2, in addition to the existing corrosion probes.</p> <p>Stress corrosion cracking in tank 8D-2 is not currently measured, but laboratory corrosion tests at Battelle-PNL are underway to determine if this type of corrosion is significant.</p>

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3 cont		<p>An on-line probe was installed, in October of 1991, in the liquid region of tank 87-2 to attempt to monitor the pitting corrosion inside this tank. Initial data from this probe indicates a pitting corrosion rate of 0.2 mils/yr, although the measurement probe and signal conditioning system are still in the developmental stage.</p> <p>Preparations are being made for laboratory tests at Battelle-PNL to evaluate the magnitude of corrosion on the tank exteriors due to the infiltration of surface and ground water. This data will be combined with internal corrosion data to predict total tank wall corrosion.</p>
4	<p>Pg. 17, paragraph 4, sentence 3 - "The SAR should demonstrate some consideration of the phenomenon of lightning strikes, because of their common occurrence and the potential resultant damage."</p> <p>Pg. 17, paragraph 5, sentence 4 - "The SAR should include a rationale for not considering the phenomenon of lightning, similar to the rationale for not considering the effect of a tornado on the control room, discussed elsewhere in the SAR."</p> <p>Pg. 24, paragraph 3, sentence 1 - "The review of accident conditions that are potentially threatening to STS equipment and operation suggests that lightning strikes also be considered since they are a credible natural phenomenon."</p>	<p>A lightning strike can be an initiator for a number of scenarios which were analyzed (e.g., fires, loss of power, structural damage). Therefore, the consequences of a lightning strike are enveloped by the analyses presented in Rev. 6 of the SAR.</p>

No.	NRC SER Suggestion	WVNS' Response
5	<p>Pg. 18, paragraph 2, sentence 4 - "The SAR should include mention of the sludge mobilization pump access in its discussion on tornado missiles, along with a rationale similar to that provided elsewhere in the SAR for not considering the effect of a tornado on the control room."</p> <p>Pg. 18, paragraph 3, sentence 7 - "The SAR should more clearly indicate that failure (of the pump column barrier) is not expected by eliminating the entry in Table D.9.3-1."</p> <p>Pg. 24, paragraph 3, sentence 2 - "The effect of a tornado missile on the SMWS pump access and enclosure is also suggested for consideration since this is a possible event."</p>	<p>The effect of a tornado on the STS and SMWS structures is considered in Table D.9.3-1. This includes the effect of a DBT on the sludge mobilization pumps. The pump enclosures are only weather structures and no credit has been taken for these structures in the analyses. The entry for the pump column barrier is included for completeness.</p>
6	<p>Pg. 21, paragraph 6, sentence 10 - "The "assumed" value in Section B.2.2 on Page B-8 of the Appendix of Reference 12 should be consistent with the 468-pound value to avoid the implication that the pump shaft will deflect and impact with fins at the bottom of the tank."</p> <p>Ref. 12. Gates, William E., "Report: 8D-2 Sludge Mobilization Wash System Confinement Barrier Integrity Review," West Valley Demonstration Project Subcontract No. 19-29929-C-MS, Task 10 for West Valley Nuclear Services Company, Inc.</p>	<p>Section D.4.1.1.6 indicates that the force of 468 pounds is within the allowable stress for the bottom gridwork. Therefore, interaction between the pump and the bottom gridwork does not affect tank 8D-2 integrity. Reference 12, Section B.3.4, page B-11, discusses the jet impingement loads on the bottom gridwork.</p>

No.	NRC SER Suggestion	WVNS' Response
7	<p>Pg. 22, paragraph 5, sentence 2 - "The WVDP ALARA program is sufficient, however, DOE may consider adding an operational trend analysis to their ALARA program."</p> <p>Pg. 24, paragraph 4, sentence 1 - "Finally, the review recommends that operational trend analysis be added to the WVDP's ALARA program,..."</p>	<p>The WVDP has a formalized ALARA program which documents our commitment to radiation protection of workers and the public and is in compliance with DOE Orders. The program incorporates measures to track and, if necessary, to reduce radiation exposures. The WVDP ALARA program is equivalent to the trend analysis. ALARA trends are tracked, analyzed, and reported on a monthly basis. All unexpected levels of exposure are investigated. In addition, all jobs which have an anticipated cumulative dose greater than 100 mrem have a formal ALARA review performed to investigate methods of dose reduction. Following the job, analyses are performed to determine if lessons learned can be incorporated into future work activities.</p>
8	<p>Pg. 23, first sentence - "Values given in Table D.8.6-1 reflect the effluent release during the total period of operations (18 months), which DOE may consider indicating in the Table."</p>	<p>Comment taken under consideration for possible addition to a future revision of the SAR.</p>
9	<p>Pg. 25, paragraph 6, sentence 2 - "This plan (WVDP Long-term Radioactive Waste Management Plan) should be revised, as necessary, as new decontamination and decommissioning criteria are established by the NRC."</p>	<p>NRC decontamination and decommissioning criteria will be evaluated by the WVDP and incorporated into the Long-term Radioactive Waste Management Plan as appropriate.</p>