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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY  
3100 Port of Benton Blvd • Richland, WA 99352 • (509) 372-7950

December 4, 2006

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EDMC

Mr. Roy J. Schepens, Manager  
Office of River Protection  
United States Department of Energy  
P. O. Box 450, MSIN: H6-60  
Richland, Washington 99352

Re: Review of RPP-28538, Rev.1-D, *Double-Shell Tank System Integrity Assessment Report*,  
*HFFACO M-48-14*

Reference: Letter from J. J. Lyon, Ecology, to R. J. Schepens, United States Department of  
Energy-Office of River Protection, "Double-Shell Tank System Integrity  
Assessment, HFFACO Milestone M-48-14, RPP-28538, Revision 1-D," dated  
September 11, 2006

0070796

Dear Mr. Schepens:

The Department of Ecology reviewed the Double-Shell Tank (DST) System Integrity Assessment Report. Our comments are provided in the enclosed Review Comment Record. Following resolution of the comments, Ecology will determine whether the *Double-Shell Tank Integrity Assessment Report*, RPP-28538, Rev. 1-D, meets the requirements of Hanford Federal Facility Agreement and Consent Order (HFFACO) Milestone M-48-14.

The major areas of the DST Integrity Assessment Report and Program that we need to discuss include:

- Incorporation of a nationally recognized standard for integrity assessments of ancillary equipment, piping, and tanks (e.g., American Society of Mechanical Engineers Codes).
- Demonstration (crosswalk) that the current out-year planning baseline for ongoing DST system monitoring incorporates at a minimum the Independent, Qualified, Registered Professional Engineer series of recommendations provided in RPP-28538, Revision 1-D.
- Overview of the Pending Cathodic Protection System Assessments specifically addressing the system deficiencies, and plans and schedules to assess and upgrade the cathodic protection systems.

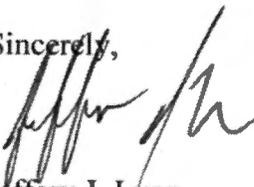


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- The recommended sequence and frequency for the equipment and tank integrity re-assessments.

We look forward to resolving our comments and concerns on the DST Integrity Assessment Report and Program. If you have any questions, contact me at 509-372-7914 or Les Fort at 509-372-7984.

Sincerely,



Jeffery J. Lyon  
Tank Waste Storage Project Manager  
Nuclear Waste Program

laf/aa

Enclosure

cc w/enc:

Dave Bartus, EPA  
Tom Post, EPA  
Mary Burandt, USDOE  
Roger Quintero, USDOE  
Woody Russell, USDOE  
Zach Smith, USDOE  
Thomas Crawford, CH2M  
Moses Jaraysi, CH2M  
Nick Kirch, CH2M  
Randy Kirkbride, CH2M

Jeff Voogd, CH2M  
Stuart Harris, CTUIR  
Gabriel Bohnee, NPT  
Russell Jim, YN  
Todd Martin, HAB  
Ken Niles, ODOE  
Dirk Dunning, ODOE  
Admin Record: SST/Tank Waste Storage  
CH2M Correspondence Control  
Environmental Portal

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5. Document Number(s)/Title(s)  RPP-28538, Rev.1, D / Double-Shell Tank System Integrity Assessment, HFFACO M-48-14	6. Program/Project/Building Number  KHR23	7. Reviewers  D. W. Hendrickson, P.E. L. A. Fort, P. E. R. Wilson	8. Organization/Group  ECY/NWP	9. Location/Phone  <b>3100 Port of Benton Blvd</b> Richland, WA/509.372.7983
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17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Date      Organization Manager (Optional)	Date      Reviewer/Point of Contact  Author/Originator	Date      Reviewer/Point of Contact  Author/Originator

Item	Location in Document	Comment	Hold Point	Disposition (Provide justification if NOT accepted.)	Status
	NA	Referential / locational abbreviations and symbology used herein include: "P" = page, § = section, ¶ = paragraph, "L" = line, "Z" = drawing zone			
1.	<b>Executive Summary</b>	<p><b>Comment:</b> Pipeline inspections are inadequate.</p> <p><b>Justification:</b> The executive summary goes on to recommend that "It is also recommended that 5% of transfer lines be directly examined per the criteria set forth in 5 years following this assessment and every 5 years thereafter, which is intended to provide adequate data for the next assessment." A continuous monitoring system appears to be needed, with full inspection of all piping not less than every five years.</p> <p><b>Modification needed:</b> Provide a discussion on how the monitoring frequency for the transfer lines is adequate to ensure failures, corrosion, and erosion problems are abated.</p>			

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2.	<b>Executive Summary</b>	<p><b>Comment:</b> Further discussions on the criteria used to determine “fit-for-use” and frequency of monitoring tank integrity.</p> <p><b>Justification:</b> The executive summary concludes that “All waste tanks are found to be fit for use” even though the document clearly shows that 241-SY-101 may no longer be “fit-for-use” in the very near future, and several other DSTs may also be no longer “fit-for-use.”</p> <p><b>Modification needed:</b> Provide a discussion on the meaning of “fit-for-use” and the monitoring frequency basis selected to ensure adequate integrity assessments of the Double-Shell Tank “DST” System.</p>			
3.	<b>General</b>	<p><b>Comment:</b> The report indicated that it does not have a distribution of actual plate thicknesses for the various steel plate used in construction on the tanks.</p> <p><b>Justification:</b> Without some knowledge of what the thickness variation was for steel plate used (or even in those eras 1940s-1970s), it is difficult to assess whether the thickness variations are due to corrosion, or to variation in the original as shipped material, or what proportion of each. .</p> <p><b>Modification needed:</b> Using the nominal plate dimension as the exact dimension and calculating corrosion requires more discussion of the uncertainty of this methodology and some form of a sensitivity analysis to bound the measured results.</p>			

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<p>4. <b>General</b></p>	<p><b>Comment:</b> Inadequate integrity assessment of the DSTs.</p> <p><b>Justification:</b> The crude thickness standards do not give basis for these standards (structural, statistical, stochastic corrosion, time versus corrosion, etc...). As written, they could be applied at any single point in the tank; or as they discuss later, they could be applied over large areas as a structural strength limitation. What is needed is clear specific criteria that can be used to determine when a tank will cease to meet requirements and that can be projected at least 7 years into the future (to provide sufficient lead time to build replacement capacity). UBC 97 seismic zone 2B no longer applies. The appropriate standard is substantially higher both under the revised USGS analysis, the revised IFC code, and from the detailed seismic spectral analysis of the Hanford site performed to evaluate the WTP. The criteria for allowable thinning will likely change.</p> <p>Furthermore, if the tanks don't meet such a revised evaluation, they will continue to be used until replacement capacity can be provided. But if they don't meet standards, a probabilistic analysis should be performed to estimate the risks, so that decision makers can make informed decisions about how to go forward. The Cascadia subduction zone event is likely either about 2100 +/- 50 years, or several hundred years later (the distribution of recurrence frequencies appears to be bimodal). And that event seems likely to be a trigger for closer events, which energetically may be even more important. However, these analyses were apparently to Service Level D, which does allow serious buckling of the tank without failure.</p> <p><b>Modification needed:</b> Discussions in the text of the document need to be enhanced to address the results and impacts that a significant seismic event could have on the DST System, replacement of the tanks may be required on an urgent basis, along with cessation of addition of wastes to any of the tanks.</p>			
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5.	General	<p><b>Comment:</b> Inadequate integrity assessment of the DSTs.</p> <p><b>Justification:</b> There doesn't appear to be an evaluation of exterior corrosion of the exterior tank walls. For example tank 241-AZ-101 suffered some significant corrosion of the exterior of the interior tank from operations for one year without ventilation, combined with in-leakage of water from above into the annular space. The most severe corrosion was on a vertical line on the north face of the vessel. However, there were broad areas of corrosion on other areas. From previous presentations to the HAB it was addressed that the exterior corrosion was about 18% on the vertical line. Since that did not reach the 20% specified, the tank was retained in service. Table 4-7 shows an interior thinning of 0.021 inches on plate #1, which is about 5.6%. The ultrasonic testing found both the interior and exterior thinning on some of the DSTs. Since the measured corrosion of the interior is not necessarily aligned with the observed corrosion of the exterior, it is possible that in the areas of exterior corrosion (particularly on that northern face), the total corrosion may exceed 20%. Accordingly, AZ-101 may be beyond its end of service life as well.</p> <p><b>Modification needed:</b> Provide a discussion and reason for excluding the evaluation of the exterior corrosion of the DSTs.</p>			
6.	General	<p><b>Comment:</b> Inadequate integrity assessment of the DSTs.</p> <p><b>Justification:</b> From the construction details provided, it appears that the exterior shoulder (haunch) was welded to the interior tank at the top. If so, this raises the question of how water leaked into the annulus. Was there sufficient exterior corrosion of that joint to allow in-leakage? If so, this raises other questions about the thickness and integrity of the exterior tanks. If it isn't welded, this raises questions about why not, and about how much in-leakage is occurring on each tank. More over, the tanks are shown to be encased in concrete, which raises the question of how water got between the concrete shell and the exterior of the interior tank wall to run down that wall and into the annular space.</p> <p><b>Modification needed:</b> Provide a discussion and basis for excluding the evaluation DST inner tank exterior corrosion.</p>			

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7.	<b>General</b>	<p><b>Comment:</b> DST corrosion mapping is absent in document.</p> <p><b>Justification:</b> Detailed maps of corrosion of both the interior and exterior of interior tank, and of the interior of the exterior tank <u>are needed</u>. These maps should clearly show the (limited) extent of UT analysis, the extent of thinning and pitting, and other problems. These should be paired with photo's showing the same areas to the extent possible, and all of these should be tracked from this report foreword. There are a few limited maps of pitting corrosion included in the document. There are better maps in some of the referenced documents.</p> <p><b>Modification needed:</b> Provide corrosion mapping of all the DSTs in the document.</p>			
8.	<b>§ 11.0 References</b>	<p><b>Comment:</b> The list of references is substantively incomplete in its support of the assessment and its conclusions. In addition, a concordance list (identifying where references are applied to the document) would improve referential support.</p> <p><b>Justification:</b> Documents not recognized in this section (and their pages where referenced) include: RPP-RPT-26254 (4-20), RPP-RPT-25608 (4-28, 5-1), RPP-7814 (4-36), HNF-3484 (5-1), and 34 reports in Table 6-1 (6-2, 6-3). These documents are referred to support the conclusions of this Integrity Assessment.</p> <p><b>Modification needed:</b> Update and complete the list of references with concordance.</p>			
9.	<b>P 3-2, § 3.3, ¶ 3</b>	<p><b>Comment:</b> Certifying Engineer has not clearly stated waste compatibility compliance.</p> <p><b>Justification:</b> This paragraph indicates that the IQRPE found the "recommendations of the expert panel to be based on sound judgment and appropriate expertise." He did not assert, as IQRPE, that the actions of chemistry optimization efforts were sufficient to demonstrate that wastes were or would be compatible with the tank system material.</p> <p><b>Modification needed:</b> Clarify assertion – positive or negative (e.g. regarding piping insulation IQRPE expressed that inadequate information and anticipated degradation provided no basis for assertion that insulation would mitigate corrosion). May wish to coordinate text with § 9.2.6.4.</p>			

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10.	P 4-8, § 4.4, Table 4-2	<p><b>Comment:</b> The Quality Control features entry for the 241-AN Farm would appear to be incomplete in address of Tank 241-AN-107.</p> <p><b>Justification:</b> Table 4-4 of this section identifies that 241-AN-107 was constructed under a separate project (B-170 rather than B-130). The NDE of Table 4-4 asserts that B-170 used the same procedures as B-130.</p> <p><b>Modification needed:</b> Amend Table 4-2 AN Farm QC entries to clarify 241-AN-107 applicable quality control features.</p>			
11.	P 4-14, § 4.6, Table 4-7	<p><b>Comment:</b> Wall thicknesses reported in this table are inaccurate and may be misreported.</p> <p><b>Justification:</b> Review of Ultrasonic testing documents in support of these reported wall thicknesses for Tanks 241-AP-106 and 241-AY-102 (RPP-RPT-23205 Rev 0A and HNF-4818 Rev 0, respectively) find that thicknesses reported for 241-AP-106 were less than reported in the examination report by 7 to 15.8 mil and thicknesses reported for 241-AY-102 were greater than reported in the examination report by approximately 9 mil (~1.2% - 2.2% of wall thickness). Although method evaluation yields a known variance of approximately 12 mil, inconsistency of this report with its reference documentation is not described nor defended.</p> <p><b>Modification needed:</b> Verify and correct Table 4-7 of minimum tank wall thicknesses.</p>			

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12.	<p>P 4-15, § 4.6,          And          P 4-18, § 4.9.1,          ¶ 3</p>	<p><b>Comment:</b> Replacement of the SY Tanks appears imminent and needs to be discussed in detail within the report.</p> <p><b>Justification:</b> The discussion for tank 241-SY-101 talks first about the corrosion of the tanks not having it fail (assuming uniform corrosion since 1974 and from now into the future) for 109 years. Three pages later they indicate that the corrosion allowance (20% thinning) will be reached in two years! Since the data this is based on is 2004 data, presumably this implies that SY-101 is at end of life and needs to be emptied now. Since no replacement capacity exists and since it may take up to seven years to obtain new capacity, this would mean the tank is in use possibly for seven years beyond its actual end of service life. Also supporting documents indicate that SY-101 has already exceeded its corrosion allowance and is accordingly beyond end of service life.</p> <p><b>Modification needed:</b> Rectify inconsistencies and provide a detail discussion on the need to begin planning for DST replacements.</p>			
13.	<p>4.9.1, P 4-17,          Table 4-9</p>	<p><b>Comment:</b> Inadequate discussion of the integrity of DSTs.</p> <p><b>Justification:</b> There does not appear to be a real set of standards for evaluating the integrity of tanks. There are crude standards (such as Table 4-9, Ultrasonic Inspection Criteria; and page 4-35, 4.13.7 a maximum thinning of 0.060 inches) and using the UBC 97 seismic zone 2B (page 95) for seismic evaluation.</p> <p><b>Modification needed:</b> Clearly discuss and defend the evaluation criteria based on national recognized standards.</p>			
14.	<p>4.9.1, P 4-19,          Table 4-10</p>	<p><b>Comment:</b> Inadequate discussion of the integrity of 241-AY-101.</p> <p><b>Justification:</b> The discovery of 72 areas of &gt;10% wall thinning with a maximum of 20.2% reduction in thickness would appear to constitute among the greatest of recognized material losses identified in this document but no textual discussion is provided to defend compliance with design and operating standards which detail wall thinning in excess of 20% as unacceptable for operation.</p> <p><b>Modification needed:</b> Clearly discuss and defend assertion of "Fit-For-Use" designation in light of this corrosion evidence.</p>			

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15.	4.9.1, P 4-19 - 4-21, Table 4-10	<p><b>Comment:</b> Inadequate discussion of the integrity of several DSTs.</p> <p><b>Justification:</b> The thickness standards are clearly inadequate to say whether a tank is at end of life when it exceeds in one spot, over one area (unspecified in size), over a region (unspecified size and shape), or uniformly. If it is applied when any area reaches 20% or 0.060 inches; which ever is less, then these tanks appear to be at end of life today:</p> <p>AN-105, AP-102, AY-101, SY-101 &amp; possibly AZ-101 (Secondary wall corrosion. Exterior of interior is near limits on a line at the north face.)</p> <p>AZ-102 appears to be 2-3 years from end of life by this standard.</p> <p>AN-101 appears to be less than six years from end of life by this standard.</p> <p>AP-108 appears to be less than nine years from end of life by this standard.</p> <p>SY-102, SY-103 and AN-102 appear to be 11 to 13 years from end of life by this standard.</p> <p>AN-103 appears to be about 13 years from end of life by this standard.</p> <p><b>Modification needed:</b> Clearly discuss and defend assertion of "fit-for-use" designation in light of this corrosion evidence.</p>			
16.	§ 4.10, ¶ 2, P 4-26	<p><b>Comment:</b> Inadequate references and conclusions</p> <p><b>Justification:</b> This paragraph refers to expert study of PNNL analyses but does not identify which analyses were reviewed nor the resulting document from the experts. Their result was summarized as inconsequential to operating loads.</p> <p><b>Modification needed:</b> Identify the material reviewed, report of that review, and any actions undertaken resulting from the review.</p>			
17.	§ 4.10.1, P 4-27	<p><b>Comment:</b> Further assessment of the insulating grout structural strength needs to be added.</p> <p><b>Justification:</b> The concrete based under the interior tanks is crumbling in many (if not most cases). The report discusses and dismisses any further analysis. Page 4-27 reports that analysis of the demand to capacity ratio exceeds 1.0 for several sections.</p> <p><b>Modification needed:</b> Provide additional discussions on the demand analysis to capacity ratio exceeded 1.0 for several sections.</p>			

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<p>18. § 4.10.5, ¶ 3, P 4-32</p>	<p><b>Comment:</b> Incomplete understanding of operating status.</p> <p><b>Justification:</b> The IQRPE notes that tank farm control documents would allow waste of sufficient specific gravity be placed into AY farm tanks that the demand would equal the capacity of the secondary tank lower knuckle stress limits and that such documents would be needed to changed to reduce allowable specific gravity.</p> <p><b>Modification needed:</b> Text should clearly state actions Tank Farms is undertaking, or has undertaken, to change their control documents or provide other assurances that these stress limits will not be exceeded.</p>			
<p>19. § 4.10.5, P 4-32</p>	<p><b>Comment:</b> Statistical methods should be used to assess the minimum tank wall thickness.</p> <p><b>Justification:</b> The analysis of interior corrosion of the tank covers a very limited area of the surface of the tank (appears to be less than 15% of the circumference). At a minimum, statistical methods should be used to assess the likely minimum tank wall thickness at any location around the circumference at all elevations. This will be less (perhaps significantly less) than the minimums observed in the measured portions.</p> <p><b>Modification needed:</b> Provide statistical methods to assess the likely minimum tank wall thickness at any location around the circumference at all elevations.</p>			
<p>20. § 4.10.5, P 4-32</p>	<p><b>Comment:</b> Analyze sidewall tank penetration weld integrity.</p> <p><b>Justification:</b> There does not appear to be a robust analysis of sidewall tank penetration weld integrity. For example, the AN tanks have a 0.250 inch exterior wall thickness on the lower knuckle. This is hard to reconcile as a secondary tank standard with the interior wall thickness of 0.875 inches. During a major seismic event, if the interior leaks, the exterior must be presumed to have failed completely and to not serve as a barrier to release.</p> <p><b>Modification needed:</b> Provide an analysis of sidewall tank penetration weld integrity.</p>			

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21.	§ 4.13.6, P 4-35	<p><b>Comment:</b> Inadequate discussion of recommendations.</p> <p><b>Justification:</b> The AY tanks are limited to a maximum specific gravity of 1.77 based on the capability of the secondary tank wall (also limited based on maximum leak rate, height to first non-enhanced weld inspection joint, and initiation of stress corrosion cracking in 12 weeks).</p> <p><b>Modification needed:</b> Provide detail, references, and IQRPE assessment upon the impacts to the integrity of these tanks.</p>			
22.	§ 4.13.9, P 4-36	<p><b>Comment:</b> Inadequate discussion of recommendations.</p> <p><b>Justification:</b> The referenced report is not identified therein, and the statement that "history of this tank with regard to external corrosion on the primary tank is well known" is insufficiently descriptive. As the specific recommendations of that comment are also not discussed, and the reports and allusion to tank history unreferenced, this reviewer finds the value of this entry not useful in assuring fitness for use of tank 241-AY-101.</p> <p><b>Modification needed:</b> Provide detail, references, and IQRPE assessment upon the impacts to the integrity of this tank.</p>			
23.	P 6-32, § 6.10, ¶ 2	<p><b>Comment:</b> Insufficient clarity between 'assessed' and 'fully assessed'</p> <p><b>Justification:</b> Text in the proceeding paragraph indicates that pits which were not assessed were designated as NAFU (not authorized for use), but this text states that no pit or vault 'fully assessed' was found to have failed. There may be a gap between these expressions which may indicate partial assessments have indicated failures.</p> <p><b>Modification needed:</b> Clarify expressions and detail any partial assessments indicating failure. Coordinate with recommendations as necessary.</p>			

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<p>24. Pp 1-5, 6-5, 6-33, 7-8, 9-2, App G.</p>	<p><b>Comment:</b> The IQRPE has not adequately discussed the application of results of a supporting document.</p> <p><b>Justification:</b> RPP-25153 has been frequently referenced by the IQRPE to discuss waste compatibility but not described in effect nor summarized in recommendations. The document states that only about 1/3 of transfers between 1995 and 2005 were followed with flush with very few identified as caustic flushes. Such transfers would appear to demonstrate routine lack of compliance with operating procedures for corrosion control. The extensive impact of this support document upon this IA should not be discounted as a reference, as it poses a critical component to this IA.</p> <p><b>Modification needed:</b> IQRPE recommendations should clearly identify that actions be taken by Tank Farms to assure corrosion control procedural compliance. The summaries should clearly point to Appendix G of this assessment.</p>			
<p>25. Pp 1-5, 6-1, 7-5, 7-7, 9-12, App G</p>	<p><b>Comment:</b> The IQRPE has not adequately discussed the application of results of a primary Secondary document.</p> <p><b>Justification:</b> RPP-25299 has been extensively referenced by the IQRPE and detailed in Appendix G but not described in effect not summarized in recommendations. The support document substantially states that no cohesive cathodic protection systems, procedures, and actions exist to protect the tank systems from external corrosion. The extensive impact of this supporting document upon this IA should not be avoided as a reference as it poses a critical component to this IA.</p> <p><b>Modification needed:</b> The IQRPE recommendations should clearly identify actions to be taken by Tank Farms (even if to entirely shut off CPS to avoid using balance of system sacrificially), even if such recommendations are simple summary recitation from the sub-tier document. Additional text discussion should include recommendations regarding the development of RPP-25299 as an entirely-paper preparation with no field investigation.</p>			

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26.	P A-8, Table A-1; § 4.9.1	<p><b>Comment:</b> Inspection secondary document not conservative with no discussion provided.</p> <p><b>Justification:</b> RPP-RPT-23205 Rev 0A is referenced for the UT of 241-AP-106. Its calculational approach to wall thinning uses nominal dimension minus minimum wall thickness which is not conservative in the manner used as RPP-25838 or piping IA which used Nom + mill variation - minimum to yield corrosion rate. The direct reference to this UT testing without describing a less conservative assessment of corrosion is inadequate for a tank which is estimated to demonstrate up to 9% wall loss at the air line without that conservatism applied throughout the balance of this IA.</p> <p><b>Modification needed:</b> Discuss and assess percent wall loss for 241-AP-106 in a manner consistent with that applied for other tank system components.</p>			
27.	§§ 6.0 and 6.11.2	<p><b>Comment:</b> Periodicity of inspection of pit 241-AW-04A may be inadequate.</p> <p><b>Justification:</b> RPP-RPT-25854, Rev. 0, noted epoxy coating on floor coated residual materials following cleanout which would result in eased damage to the coating.</p> <p><b>Modification needed:</b> A different frequency of inspection for pits with evidence of increased likelihood in coating breach is needed.</p>			
28.	P 6-1, § 5.0 and App G.	<p><b>Comment:</b> The IQRPE has not adequately discussed the application of results of a principle supporting document.</p> <p><b>Justification:</b> RPP-18652 was prepared for assessment of buried pipe but no significant discussion of that report nor recommendations or discussion for periodicity of assessment are made in this IA encompassing the entire DST system.</p> <p><b>Modification needed:</b> State recommendations and basis for 5% / 5 yr assessment; for it appears that availability of resources is the basis and not the assurance of the system integrity.</p>			

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29.	P 9-13, § 9.2.6.4	<p><b>Comment:</b> Questionable DST Fill Height determinations.</p> <p><b>Justification:</b> 9.2.6.4 number 3. on page 9-13 notes that some tanks have exceeded their 20% allowable wall thinning criteria, and goes on to note that is primarily in the vapor space. This may challenge DOE's proposal to increase the liquid level in the tanks as a way to increase capacity in the tank farms. To the contrary, this may indicate the need to not allow such waste addition to prevent waste being in contact with the wall in thinned areas.</p> <p><b>Modification needed:</b> Provide proper justification that adequate determinations have been done to ensure that DSTs can be filled to 460" of waste.</p>			
30.	P E 53-54	<p><b>Comment:</b> The IQRPE has not adequately discussed the video findings.</p> <p><b>Justification:</b> The tank video summaries on pages E-53 and E-54 clearly fail to document the extensive corrosion of the exterior of tank AZ-101. This raises questions about the assertions and summaries of all of the videos.</p> <p><b>Modification needed:</b> Provide further discussions on the appropriate video review criteria and how all the DSTs meet that criteria.</p>			

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31. P F-61	<p><b>Comment:</b> Address erosion and corrosion aspects of the DST piping systems.</p> <p><b>Justification:</b> Page F-61 failure of transfer piping in association with S-103 saltwell pumping. This section correctly notes that corrosion detection and monitoring system is needed. More than that, each failure of a primary needs to be investigated to determine precise location and cause; and to begin immediate cleanup. Non-secondarily contained systems should be removed from service, drained, rinsed and scheduled for removal. For the SST's, the caustic content of many of the tanks is extraordinarily high. This occurred as the pH monitoring was presumed to be accurate and caustic was added to establish and maintain a high pH. Unfortunately, due to the inadequacies of the pH monitoring and understanding of the limitations, excessive caustic was added. As a result, the high caustic tanks continually pull moisture from the air diluting the caustic and slowly refilling the interim stabilized tanks. Pumping of this waste liquid is made extremely difficult by the high viscosity of high concentration caustic solutions (100-1,000 centipoises). This high viscosity in turn leads to very high pressure gradients in piping used to pump the waste. And this makes failures much more likely. This failure is most likely due to a combination of chemical corrosion AND high pressure. Also Page F-62 and F-63 notes many failures in piping due to erosion.</p> <p><b>Modification needed:</b> Expand discussions on how erosion and corrosion aspects of the DST piping systems need to be inspected and assessed to ensure piping integrity.</p>			
32. P F-63	<p><b>Comment:</b> Address external corrosion potentials for all aspects of the DST System.</p> <p><b>Justification:</b> Page F-63 notes external corrosion failure of piping where the metallurgy is the same as that used for the S tank farm, raising additional concerns about external corrosion of those associated tanks as well.</p> <p><b>Modification needed:</b> Provide a discussion on the external corrosion potentials for all aspects of the DST System.</p>			

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**REVIEW COMMENT RECORD (RCR)**

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33. P F-66	<p><b>Comment:</b> Best practices for all aspects of the DST System.</p> <p><b>Justification:</b> Page F-66 notes that best practice is to use multiple independent corrosion monitoring techniques for the DSTs. The same should be true for the transfer lines, valves, valve boxes, etc...</p> <p><b>Modification needed:</b> Provide a discussion as to how best practices are being deployed for all aspects of the DST System</p>			
34. P F-69	<p><b>Comment:</b> Detection of transfer lines corrosion problems.</p> <p><b>Justification:</b> Page F-69 recommends that DCVG and ACVG systems be used to help assure detection of corrosion problems on transfer lines. This should be implemented on a broad basis as part of a comprehensive program.</p> <p><b>Modification needed:</b> Provide a discussion on the use of DCVG and ACVG systems be used to help assure detection of corrosion problems on transfer lines.</p>			