

**HSS Independent Activity Report - Rev. 0****Report Number:** HIAR-HANFORD-2013-10-28**Site:** Hanford - Office of River Protection**Subject:** Office of Enforcement and Oversight's Office of Safety and Emergency Management Evaluations Activity Report for the Follow-Up on Previously Identified Items Regarding Positive Ventilation of Hanford Underground Waste Tanks**Dates of Activity :** 10/28/13 – 11/06/13**Report Preparer:** Robert E. Farrell**Activity Description/Purpose:**

In 2011, an Independent Oversight review of Hanford Tank Farms safety basis amendment for double-shell tank ventilation system upgrades identified four items for follow-up. An April 2011 Independent Oversight activity report for Hanford Tank Farms, *Unreviewed Safety Question Process Review*, identified two issues regarding the contractor's unreviewed safety question (USQ) process and Office of River Protection (ORP) oversight of that process. The purpose of this Independent Oversight visit to ORP was to review action taken regarding the follow-up items identified in the 2011 reports. During this visit, Independent Oversight accompanied the ORP manager on a tour of the 242 evaporator.

**Result:**

Previously identified items for follow-up:

- 1. Tank vacuum protection device isolation:** *Follow-up on closure of WRPS-PER-2011-1709. Review to verify that appropriate measures have been implemented to address the concern that contrary to applicable code requirements, isolation devices exist in the 241-AN-Tank Farm ventilation system between the vacuum relief valves and some of the tanks they are intended to protect.*

The isolation valves in question are manually operated valves used for the annual balancing of tank ventilation flow that is required by technical safety requirements. The valve operators are located in a closed valve pit inside the tank farm area (controlled access). Upon completion of the annual flow surveillance, the configuration of the manual valves is confirmed, and the valve pit is closed and not accessed again until the next annual surveillance is due. Further, the vacuum maintained in the tanks is monitored and recorded as part of routine tank farm operator rounds. Inadvertent isolation of the vacuum breakers also isolates intake air (vacuum breakers are mounted on the intake air header) and would be indicated by rising vacuum in the tank. The AW-Tank Farm has the same vacuum breaker configuration as the AN-Tank Farm. Due to scheduled tank farm activities, the AW-Tank Farm was easily accessible for tour during this review. Independent Oversight, accompanied by the contractor tank ventilation cognizant system engineer (CSE) and the ORP safety system oversight (SSO) engineer toured the AW-Tank Farm. The Independent Oversight team observed that the valve pits where the manual isolation valve operators are located were closed and inside the fenced and locked (or constantly manned) tank farm area. Redundant tank vacuum indicators are installed and were being read by tank farm operators performing normal rounds.

This item is closed.

- 2. Tank vacuum protection from fan over speed due to variable frequency drive (VFD) failure:** *Follow-up on closure of WRPS-PER-2005-0183, and review the summary of technical evaluations and protective actions taken to ensure that the impact of VFD failures on tank vacuum protection is adequately addressed.*

The contractor's structural engineers accompanied by tank farm engineering management and the tank ventilation system CSE presented Independent Oversight and the ORP SSO with the results of engineering calculations RPP-CALC-28557 and RPP-CALC-28316 that evaluate the adequacy of double-shell tank vacuum protection in the event of VFD failure induced exhaust fan over speed. The calculations showed that double-shell tank vacuum protection was adequate to protect the tanks in the event of VFD failure. The structural engineers also presented the results of Pacific Northwest National Laboratory Report PNNL-15711, which showed that the double-shell tanks can withstand more vacuum than the design values used in setting conservative vacuum operating limits to preclude approaching design limits. In the event of VFD failure, the protection of the double-shell tanks is adequate.

This item is closed.

3. **Controls for seismic induced gas release events:** *Verify that adequate explanation has been provided in the DSA [documented safety analysis] for why no practical control exists for seismic induced flammable gas release design basis events, and how the systems for flammable gas controls, which are not capable of preventing or mitigating releases exceeding the LFL [lower flammability limit] for this event, are acceptable. The additional explanation is expected to be included in the next anticipated safety basis amendment for designating tank farms emergency preparedness program as a Key Element.*

The contractor amended the DSA by adding an Administrative Control Key Element requiring evacuation of double-shell tank farms following seismic events that could cause induced flammable gas accidents. The discussion of seismic events concluded that seismically induced flammable gas releases from single-shell tanks could not reach the LFL. ORP reviewed the DSA amendment, documented its review in a Safety Evaluation Report (with attachment to ORP Correspondence 12-NSD-0057 Samuelson to Johnson, dated October 17, 2012), and concurred with the contractor's conclusions.

This item is closed.

4. **Volcanic ash fall design considerations:** *Follow-up on closure of WRPS-PER-2011-1698. Verify that the applicable TOC engineering standard(s) is revised to include expanded considerations for the design of the PTV [primary tank ventilation] systems with respect to all of the potentially detrimental effects of volcanic ashfall, and that these additional considerations are also appropriately reflected in the designs and procurement specifications for these systems.*

Washington River Protection Solutions (WRPS) Procedure TFC-ENG-DESIGN-C-45, *Control Development Process for Safety-Significant Structures, Systems, and Components*, was revised to include volcanic ashfall in design considerations, both the weight of ash in loading considerations and ash in the air as an environmental consideration. WRPS Standard TFC-ENG-STD-02, *Environmental/Seasonal Requirements for TOC Systems, Structures, and Components*, includes ashfall as an environmental consideration including allowing for re-suspension of ash after the initial deposition. WRPS Standard TFC-ENG-STD-06, *Design Loads for Tank Farm Facilities*, provides consideration of volcanic ash in the design loads of tank farm facilities.

This item is closed.

5. Follow-up with ORP to determine if an ORP surveillance of the USQ out-of-scope document, RPP-27195, is performed to ensure that all potential changes for the items listed in that document could be excluded from the USQ process.

ORP performed a comprehensive assessment of the WRPS USQ process, Report Number: A-12-NSD-TANKFARM-003, July 2012, *Assessment of Tank Farm Unreviewed Safety Question Process*. This assessment included a complete review of the WRPS USQ out-of-scope document RPP-27195. Following resolution of questions about and challenges to documents included in RPP-27195, ORP approved RPP-27195, Revision 3. ORP required that the WRPS USQ procedure be revised to require ORP approval of any additions to RPP-27195. Revision F of WRPS Procedure TFC-ENG-SB-03, *Unreviewed Safety Question Process*, includes this requirement for ORP approval of additions to RPP-27195. This revision establishes ORP control of USQ document exclusions.

This item is closed.

6. Follow-up with ORP to ensure ORP conducts an adequate review of TOC corrective actions to ensure that its USQ process is compliant with 10 CFR 830.203 and consistent with DOE Guide 424.1-1B.

As noted in the discussion of item 5, Revision F of WRPS Procedure TFC-ENG-SB-03, *Unreviewed Safety Question Process*, and WRPS USQ out-of-scope document RPP-27195, Revision 3 (approved by ORP via ORP Correspondence 13-NSD-0031, Smith to Olson, dated September 3, 2013) resolved findings and observations identified in the ORP assessment of the WRPS USQ process conducted in 2012. The revision to WRPS Procedure TFC-ENG-SB-03 also documents positive ORP control over the WRPS USQ out-of-scope document.

This item is closed.

<b>HSS Participants</b>	<b>References</b>
1(lead). Robert E. Farrell	<ul style="list-style-type: none"> <li>WRPS Procedure TFC-ENG-DESIGN-C-45, Rev. D-5, <i>Control Development Process for Safety-Significant Structures, Systems, and Components</i></li> </ul>
	<ul style="list-style-type: none"> <li>WRPS Standard TFC-ENG-STD-02, Rev A-10, <i>Environmental/Seasonal Requirements for TOC Systems, Structures, and Components</i></li> </ul>
	<ul style="list-style-type: none"> <li>WRPS Standard TFC-ENG-STD-06, Rev C-8. <i>Design Loads for Tank Farm Facilities</i></li> </ul>
	<ul style="list-style-type: none"> <li>ORP Correspondence 12-NSD-0036, Fletcher to Simpson dated July 27, 2012, <i>CONTRACT NO. DE-AC27-08RV 14800 - ASSESSMENT REPORT A-112-NSD-TANKFARM-003 - ASSESSMENT OF TANK FARM UNREVIEWED SAFETY QUESTION (USQ) PROCESS</i></li> </ul>
	<ul style="list-style-type: none"> <li>ORP Correspondence 13-NSD-0031, Smith to Olson dated September 3, 2013, <i>CONTRACT NO. DE-AC27-08RV14800-APPROVAL TFC-ENG-SB-C-03, "UNREVIEWED SAFETY QUESTION PROCESS," REVISION F AND RPP-27195, "TANK OPERATIONS CONTRACTOR UNREVIEWED SAFETY QUESTION OUT OF SCOPE DOCUMENTS," REVISION 3</i></li> </ul>

Were there any items for HSS follow up?  Yes  No

<b>HSS Follow Up Items</b>
<ul style="list-style-type: none"> <li>None.</li> </ul>