

**HSS Independent Activity Report - Rev. 0****Report Number:** HIAR-HANFORD-2013-04-15**Site:** Hanford - Office of River Protection**Subject:** Office of Enforcement and Oversight's Office of Safety and Emergency Management Evaluations Activity Report for Operational Awareness at the Hanford Tank Farms**Dates of Activity :** 04/15-26/2013**Report Preparer:**

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**Activity Description/Purpose:**

The Office of Health, Safety and Security (HSS) Office of Safety and Emergency Management Evaluations (HS-45) Site Lead conducted an operational awareness visit to the Office of River Protection (ORP) to tour the Hanford Tank Farms, observe video inspection of single shell and double shell tanks, and observe Tank Farm project and staff meetings.

**Result:**

1. The contractor conducted a Tank Farm emergency response drill that assumed a hydrogen gas conflagration inside tank SY-103. The HS-45 Site Lead accompanied the ORP radiation protection subject matter expert (SME) observing worker actions at the Tank Farm. ORP observers indicated that worker performance was better than in previous drills but, while acceptable, still had room for improvement. ORP is providing their observations to the contractor.
2. ORP and the contractor conducted two periodic counterpart meetings that appeared productive. The ORP Safety and Health Division Director and contractor Manager, Environment, Safety, Health, and Quality co-chaired a meeting that included the ORP health, safety, and quality SMEs and their contractor counterparts. Issues requiring additional attention were identified, previously-identified issues were discussed, and progress was reported to ORP and contractor management. Dedication of commercial grade items to safety applications was identified as an issue with which the contractor and ORP SMEs were experiencing difficulty. The HS-45 Site Lead identified to the ORP quality assurance (QA) SME that the Nuclear Regulatory Commission (NRC) had substantial information on the subject. After the meeting, the HS-45 Site Lead provided the ORP QA SME with:
  - NRC Inspection Procedure 38703, *Commercial Grade Dedication* (Engineering functional area);
  - NRC Inspection Procedure 43004, *Inspection of Commercial-Grade Dedication Programs*;
  - NRC Generic Letter 91-05, *Licensee Commercial-Grade Procurement and Dedication Programs*;
  - Slides from the December 2008 NRC Workshop on Vendor Oversight for New Reactor Construction presentation on *Commercial Grade Dedication: Historical Perspective*; and
  - Slides from Shaw Areva Mox Fuel Services presentation to NRC on *Non Power Reactor: "MOX Project Commercial Grade Dedication Challenges."*

Similar to the Safety and Health counterparts meeting described above, the ORP Tank Farms Operations Division Director and the President of Washington River Protections Solutions (WRPS), the Tank Farm operating contractor, co-chaired a meeting attended by contractor managers and the ORP Tank Farm Facility Representatives to discuss current operations issues. As at the Safety and Health counterparts meeting, there was a good two-way flow of information and ideas.

3. Internal ORP meetings observed included: the start-of-the-week Tank Farms Project meeting, the Tank Farms Retrieval/Closure Integrated Project Team meeting, the Tank Farms Programs Division meeting, and the Tank Farms Operations Division meeting. The Tank Farms Operations Division meeting included a team exercise in memory, communication, and teamwork that required all the Tank Farm Facility Representatives to work together with a pair of safety program SMEs to solve a practical problem: finding a clean pathway safely through a hypothetical contamination area. All parties actively participated and the group worked well together.
4. Contractor meetings observed included the morning meeting at the 222 Analytical Laboratory, morning Tank Farm meetings, the pre-drill briefing for the emergency preparedness drill, and pre-job briefings for video inspection of single shell tanks and the double shell tank annulus.
5. The Tank Farms contractor, WRPS, conducted a demonstration of tank level monitoring. This demonstration included the Enraf tank level monitoring device, which measures the decrease in the apparent weight of a float lowered to the tank waste from above to indicate the waste level in a tank. Also demonstrated was the Liquid Observation Well (LOW) method, which involves lowering a neutron source into a dry pipe that reaches to the bottom of the tank; the count of thermal neutrons resulting from moderation by water molecules in the tank indicates the presence of moisture, with a

step drop-off in count rate indicating the top of the moisture level in the waste. Entrained liquid can be identified in this manner because the entrained liquid will show a high count rate relative to the count rate, both below and above, resulting from solid waste.

6. The LOW method is used in the single shell tanks. The HS-45 Site Lead asked the presenters whether the criticality safety evaluation for the tanks containing transuranic waste included an evaluation of the LOW method introducing a neutron source to the tank. The presenters did not know the answer, and this question was forwarded to ORP Nuclear Safety. The ORP nuclear safety SME advised that the process is evaluated in the Tank Farms Criticality Safety Evaluation Report (CSER), RPP-7475, *Criticality Safety Evaluation for Tank Farms*, and in the operating procedure. The CSER, Section 7.2.1, *Allowed Surveillance Activities*, states that:

“Surveillance activities in the dome space do not change the quantity, composition or distribution of waste materials. The following specific surveillance activities that do not affect tank waste nuclear reactivity are allowed:

1. Liquid and solids level monitoring,
2. Liquid Observation Well (LOW) scans....”

Tank Farm Procedure TO-040-333, Revision F/3, October 30, 2012, *Liquid Observation Well (LOW) Surveillance Van Startup and Operation*, does not refer to the criticality safety evaluation or criticality safety. The ORP SME advised that WRPS is currently revising and updating the Tank Farms CSER, and the LOW surveillance technique will again be addressed.

7. The Site Lead accompanied the ORP Facility Representative observing the weekly video examination of the annular space of double shell tank AY-102, which has leaked some tank waste into the annular space between the shells.
8. The Site Lead accompanied the ORP Facility Representative observing the video examination of the interior of single shell tank T-203.
9. The Site Lead accompanied an ORP Facility Representative and the ORP electrical safety SME touring the C Tank Farm and evaluating electrical cable protection in the farm area. The SME noted improvement compared to previous tours but identified several examples of inadequate cable protection, which he will identify to WRPS in his report.
10. The Site Lead accompanied the ORP Facility Representative touring the 222S Analytical Laboratory and support facilities and observing work activities.

Documents reviewed included:

- WRPS Job Hazard Analysis Checklist TFC-WO-13-1375, April 3, 2013, *Remove Existing Dual Port Top Hat & ORSS Equipment*
- WRPS Job Hazard Analysis Checklist TFC-WO-12-5018, September 6, 2012, *AY102 Annulus Video Riser 083*
- Radiological Work Permit WTO-0399, Revision 004, March 13, 2013, *Preparation and opening of selected risers, removal and reinstallation of shield plugs/flanges performance of annulus video inspections, removal of equipment, and clean up*
- WRPS Emergency Preparedness Drill Package EM-BO-FD-2013-04-04, April 18, 2013, *Evaluate the Tank Farms Emergency Response Organization (ERO) and personnel in response to a simulated waste tank deflagration*
- WRPS Daily Report for April 24, 2013

HSS Participants	References
1. Robert E. Farrell	NRC Inspection Procedure 38703, <i>Commercial Grade Dedication</i> (Engineering functional area)
	NRC Inspection Procedure 43004, <i>Inspection of Commercial-Grade Dedication Programs</i>
	NRC Generic Letter 91-05, <i>Licensee Commercial-Grade Procurement and Dedication Programs</i>
	Tank Farm Procedure TO-040-333, Revision F/3, October 30, 2012, <i>Liquid Observation Well (LOW) Surveillance Van Startup and Operation</i>

Were there any items for HSS follow up? Yes No

**HSS Follow Up Items**

- Review the revised Tank Farms CSER, RPP-7475.