

WM2014 Conference Panel Report

PANEL SESSION 049: 049 Panel: Tuesday US DOE Featured Site: Hanford – Office of River Protection - Part 2 of 2

Co-Chairs: **Ellen Mattlin**, *US DOE-ORP, USA*
 Dawn Wellman, *PNNL, USA*

Panel Reporter: **Andrea Hopkins**, *Washington River Protection Solutions, USA*

Panelists:

1. **Kevin Smith**, *Manager, US DOE Office of River Protection (ORP);*
2. **William Hamel**, *Assistant Manager WTP, US DOE ORP;*
3. **Peggy McCullough**, *Project Director, Bechtel National;*
4. **Thomas Fletcher**, *Assistant Manager Tank Farms Project, US DOE ORP*
5. **Dave Olson**, *President and Project Manager, Washington River Protection Solutions (WRPS).*

This panel focused on the Hanford Site, U.S. Department of Energy Office of River Protection (ORP) in Richland, WA. It showcased an overview and latest strategy for ORP as well as recent progress and challenges at the Waste Treatment and Immobilization Plant (WTP) and Tank Farms. After the presentations, the panel answered questions.

Summary of Presentations:

Ellen Mattlin, Federal Project Director, ORP began the session by introducing the panel participants and describing the format of the panel session. She then played a video describing a part of the Hanford story that detailed the history of the Hanford Tank Farms.

Kevin Smith, Manager ORP began his presentation, "Protecting the Columbia River: The Office of River Protection Mission" by stating the mission and goal of the ORP. Our mission, he stated, is to safeguard the nuclear waste stored in Hanford's 177 underground tanks, and to manage the waste safely and responsibly until it can be treated in the Waste Treatment and Immobilization Plant (WTP) for disposition. He defined the goal of ORP to be a high performing organization that is the best in the Department of Energy's nuclear defense complex.

Mr. Smith described an overview of the Hanford Site pointing out the locations of the Tank Farms and the WTP on the map displayed. To provide background information, he then described elements of the Hanford Site history from the World War II era to the present day cleanup efforts.

Mr. Smith then detailed the ORP Hanford cleanup projects stating that the waste in the tanks is a cocktail of over 1800 different chemicals which continue to interact. He stated that this presents a difficult challenge for cleanup and management. He noted that all tanks are underground and the infrastructure for management and cleanup of the tanks includes the need for highly trained personnel in diverse disciplines such as RadCon, health and safety and emergency response.

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The management team was described next. Mr. Smith stated that "Our Team" is composed of the ORP which is responsible for planning, integrating and managing the River Protection Program executed by contractors performing work under ORP's overall management. Washington River Protection Solutions (WRPS) is the prime contractor responsible for safely managing and operating the Tank Farms. Bechtel National, Inc. (BNI) is responsible for the design, construction and commissioning of the Waste Treatment Plant. Advanced Technology and Laboratories International (ATL) is the prime contractor responsible for managing the 222-S Laboratory. Mr. Smith stated that the One System program will mate the Tank Farms and WTP together to ensure compatibility of flow and procedures.

Tom Fletcher, Assistant Manager and Federal Project Director of the Tank Farms Project began his presentation describing the Tank Farms as Hanford's greatest challenge: the disposition of 56 million gallons of radioactive and chemical waste in 177 tanks. He stated that no two tanks are the same in terms of their temperature, radioactivity levels, waste composition, caustic content and hydrogen production.

Mr. Fletcher then described the waste retrieval activities on-going at the C Farm and described some of the challenges inherent in this work. He stated that the farms are complex and the tanks themselves are only accessible from the ground surface through access ports called risers. He described various tools and techniques used to retrieve waste from the tanks including a Mobile Arm Retrieval System -Sluicing (MARS-S), chemical dissolution, Enhanced Reach Sluicing System (ERSS), modified sluicing, In-Tank Vehicle (Foldtrack) and Mobile Arm Retrieval System Vacuum (MARS-V). Tank farm workers perform their tasks in layers of personal protective equipment (PPE) including respirators and anti-contamination clothing. Mr. Fletcher then provided a comprehensive explanation of the C-Farm closure and retrieval status and progress to date.

Single-shell tank liquid level monitoring was described and trending data graphs were displayed. Mr. Fletcher noted that all tanks are watched closely for liquid levels. Out of 20 tanks identified with decreasing trends, only tank T-111 has been determined to be leaking and that appears to be stabilizing. The other tank level decreases are due to evaporation. He then discussed double-shell tank AY-102, the first DST to leak from its primary containment. Visual inspection indicated that there was a leak from the primary into the annular or secondary space in August of 2012. A robotic crawler device was then used to determine that there was no leak from the secondary containment.

Interim Stabilization of the single-shell tanks was described as complete by Mr. Fletcher. He stated that from 1978 to 2005, 7.5 million gallons of liquid waste was transferred to safer double-shell tanks. He said that approximately 2.7 million gallons of drainable liquid waste remains in Hanford's single-shell tanks.

Mr. Fletcher then described operational challenges being addressed at this time. These challenges include an effort to maximize DST storage space, improve Tank Farms infrastructure, complete C Farm retrieval and commence the next SST retrievals in A and AX Farms.

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Dave Olson, President and Project Manager of WRPS described the tank operations team for the Hanford Tank Operations Contract. He stated that WRPS is a prime contractor to DOE's Office of River Protection. WRPS is a joint venture between URS Corporation and Energy Solutions, with an integrated contractor AREVA. The team has approximately 1,500 employees, has completed its fifth year of operation with the contract extended through fiscal year 2016. The fiscal year 2014 budget is \$520 million.

Mr. Olson provided the mission statement of WRPS: "WRPS is committed to the safe and efficient management, retrieval and treatment of radioactive and hazardous tank waste to protect the Columbia River." He then announced that WRPS has a strong safety culture and recently achieved VPP Star Status.

Tank Farm challenges were discussed by Mr. Olson. He stated that DST storage space is "golden", and the challenge is to maximize space in the DSTs. This challenge will be met by maximizing the use of the 242-A Evaporator, which evaporates liquid from the waste and concentrates it, providing more space in the DST(s). He stated that increasing operations of the evaporator to a 24/7 schedule is one way the team will meet this challenge with a new campaign starting this summer. Another challenge is improving tank farm infrastructure such as DST ventilation improvements, control systems upgrades and weatherization efforts. An additional challenge is completing the retrieval operations in C Farm.

Mr. Olson discussed the differing types of waste in the tanks and then plans to use information learned at the Savannah River Site (SRS) and to involve the national labs, PNNL and SRNL to assist.

The integration of Tank Farms with the WTP is another challenge Mr. Olson described which will be met through using the One System organization.

Mr. Olson summarized with his goals of improving tank farm stewardship, maintaining a focus on retrievals, increasing outreach to the national laboratories, transitioning to potential line item project management and expanding integration with the WTP.

Bill Hamel, Assistant Manager and Federal Project Director of the Waste Treatment and Immobilization Plant Project began by explaining some important leadership changes in 2013: Kevin Smith became the ORP Manager in January, JD Dowell joined ORP as Deputy Manager in October, he (Bill Hamel) became the WTP Assistant Manager in February and Peggy McCullough became the WTP Project Director in July 2013.

Mr. Hamel then went on to describe the WTP project details including construction progress and technical challenges and then stated that the WTP mission is to immobilize the waste in glass adding that vitrification offers the best solution for immobilizing Hanford's high-level radioactive waste for reducing the risks of this waste.

The WTP vitrification process was explained in a step-wise fashion: transferring waste from the underground tanks, adding glass-forming agents, using high temperature melters for low-activity waste and high-level waste, pouring the melt into canisters and then transporting the low-

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activity canisters to disposal at Hanford and storing the high-level waste canisters at Hanford until transported to the national repository.

There are four nuclear facilities at WTP Mr. Hamel explained: the Low-Activity Vitrification Facility which makes low-activity glass canisters, the Pretreatment Facility which separates solids and liquids among other processes, the Analytical Laboratory for process sampling and analysis and the High-Level Waste Vitrification Facility which produces high-activity glass canisters. The Pretreatment Facility functions and a simplified flow diagram were provided. The 20 support facilities termed "balance of facilities" was described with their current construction status.

Mr. Hamel then discussed the WTP technical issues: hydrogen gas release from vessel solids, criticality concerns in WTP vessels, hydrogen in piping and ancillary vessels, pulse jet mixing performance, erosion and localized corrosion, design redundancy in black cells and in-service inspection, black cell vessel structural integrity and facility ventilation. He explained that there are highly qualified teams of experts addressing these challenges.

Peggy McCullough, Project Director for the Waste Treatment and Immobilization Plant began her discussion with an impressive safety statistic: the WTP achieved the safest year in the project's history in 2013 with the lowest number of recordable injuries in the history of the project. Additionally a "stop the drop" initiative was instituted to increase worker safety.

Ms. McCullough then provided an aerial overview of the WTP construction site pointing out the High-Level Waste Facility, the Pretreatment Facility, the Analytical Laboratory (estimated to be construction complete in 2014), the Low-Activity Waste (LAW) Facility and the Balance of Facilities (20 support buildings).

Construction accomplishments were then provided by Ms. McCullough with statistics regarding amounts of concrete poured, tons of structural steel installed, pounds of heating and ventilation ductwork installed and feet of electrical cable and piping installed in the facilities. She described progress made toward LAW completion which is expected in 2015. The placement of the LAW melter refractory casting and brick was started as well as the installation of the LAW melter trough and dam equipment.

Ms. McCullough described the vast infrastructure needed to support WTP operations known as "balance of facilities"(BOF). The BOF includes the following: steam plant, chiller/compressor facility, electrical substation and switchgear, water treatment facility, glass former storage, cooling tower and underground waste transfer systems. The 2013 BOF accomplishments included: steam plant completion turnover of switchgear building for startup, foundation for emergency power generators started, six system turnovers to startup in buildings 87 and 91 completed, more than one mile of pipe installation and testing on overhead pipe rack completed.

HLW 2013 accomplishments included the completion of placement of structural steel to the 37-foot elevation. Additional accomplishments included extensive concrete placement. Ms. McCullough described the amount and numbers of commodities installed project-wide and described the project as a "massive construction effort".

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Kevin Smith returned to the podium to discuss the Framework and concluding remarks. He stated that our team (ORP, WRPS, BNI, One System and ATL) is working as a close knit unit and that "we have a common focus". He stated support for the Secretary of Energy's "Framework" which proposes Hanford's River Protection Project cleanup mission to be completed in three phases. DOE is working with Ecology on this strategy. Mr. Smith then provided what he called a "stick diagram" for phase one of startup.

Mr. Smith then provided a schematic representation for the conceptual design of direct feed LAW, the functions of which are solids and Cesium 137 removal, evaporation of recycle and evaluation of the performance of technologies.

He described two grand challenges: treat or optimize wastes at their source and eliminate or substantially reduce LAW off-gas condensate recycle. To assist with these challenges, Mr. Smith intends to create a greater role for the national labs in flow sheet management and stewardship.

Mr. Smith articulated ORP's top ten challenges as follows: out-year funding profiles aging tank farm infrastructure, technical issues resolution, Tri-Party Agreement/Consent Decree milestones, decision to proceed on HLW, moving waste from 200 West tank farms, transition to WTP operations, quality, nuclear safety basis, finding efficiencies to shorten lifecycle.

His concluding remarks were centered on safety: "Protect the public, the environment, our workers and the Columbia River." "Safety always comes first".

Mr. Smith then opened the floor for questions from the audience.

Questions and Answers:

1. Where did the retrieved waste from the C Tank Farm get transferred?

Mr. Fletcher responded that there are two DSTs in the AN Farm to which the retrieved SST waste was transferred.

2. If the Interim Pretreatment and Tank Waste Characterization and Storage Facility are built, is there still a need for the WTP Pretreatment Facility?

Mr. Smith indicated yes, the Pretreatment Facility is needed for a throughput capability that completes the mission in the set duration.

3. What is DOE doing to improve transparency in the Tank Farms?

Mr. Smith replied that DOE provides monthly tank reports to Ecology and the public which are part of being fully transparent. Mr. Fletcher added that all tanks are covered in that report, and that in the future the reports will be automated and accessible online. He stated that a GIS-based system similar to the groundwater report will be provided "live" on the web.

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4. Is all LAW suitable for vitrification or will other additional avenues be required?

Mr. Fletcher replied that the use of Cesium ion exchange for Cesium removal will be necessary as well as particle removal. The Department is assessing all options for supplemental treatment.

5. How often is Tank AY-102 inspected to ensure that it is not leaking to the environment and what about tanks with similar construction histories?

Mr. Olson and Mr. Fletcher discussed the weekly video inspections performed on Tank AY-102, the tank level evaluations and the extent of condition reviews that are performed on similar tanks. There are also visual inspections performed on the tanks with camera equipment. Mr. Fletcher added that over 250 boxes of archived materials were studied in order to evaluate the construction history of tanks similar to AY-102.

6. What is being done to improve quality at the WTP?

Mr. Smith, Ms. McCullough and Mr. Hamel responded that the DOE and BNI are working together to improve quality on the WTP including self-identification of issues and necessary improvements, improved worker training, and improvements in procedures and procedural compliance. DOE has requested a management improvement plan from BNI and has encouraged self-identification of issues. Ms. McCullough has made a management decision to ensure that the line organization is accountable for quality as the line management has control over their budget and schedule. She has also made changes in how BNI performs corrective actions. Mr. Smith added that self-reporting is now rated in regards to award fee.

7. What is being done to get the 242-A Evaporator up and running?

Mr. Fletcher discussed the readiness assessments (RA) that are in progress. Readiness assessments are used to determine if there are issues relative to startup so that they can be resolved.

8. How confident are DOE and WRPS about the condition of the DSTs as they will be holding waste for decades?

Mr. Smith replied that there is a risk as the tanks are aging, and that the risk must be managed through integrity assessments, corrosion control and inspections. He said the funding to maintain these programs is included in our min safe category.

9. Why send SST waste to the DSTs?

Mr. Fletcher replied that it is more protective of the environment to send SST waste to the DSTs because the DSTs have secondary containment which provides more protection to the environment.

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Panel Closing Remarks:

Ms. McCullough and Mr. Hamel remarked on the positive change in teamwork between the contractors and federal staff, and that teamwork is crucial to success while they continue to solve the technical issues.

Mr. Olson and Mr. Fletcher remarked that the Framework is a good pathway and that for this critical mission the framework and teamwork will "get us there". The importance of funding was also identified.

Mr. Smith closed with: "I am a Washington kid. Our team is focused, we have high standards, we are not in an easy spot, but I have the confidence that we have the people in place needed to accomplish our mission".