Lessons Learned Corner—
Finding Solutions
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'Limit of Technology' Reached in Tank S-112

Documentation is being prepared to notify the Washington State Department of Ecology that we believe waste retrieval from single-shell tank S-112 has reached the "limit of technology." This means that retrieval efficiency has dropped to the point that if we continue using the current technology, retrieval would take one or two more years and consume an additional one million gallons of double-shell tank storage space to retrieve the remaining 30,000 gallons of waste still in the tank. As a result, we are examining alternative approaches to removing the remaining waste.

Tank S-112 is a 758,000 gallon single-shell tank built in 1950 in the 200 West Area. Waste retrieval began in September 2003. "Approximately 96 percent of the waste in tank S-112 has been retrieved using a technique known as saltcake dissolution, but like any technology, there is a limit to what it can accomplish," said Rick Raymond, Director of S Farm Retrieval Operations. "We will now have to find a different set of tools to complete the task."

Saltcake dissolution technology uses water sprayed at 100 psi and up to 100 gpm to dissolve waste so it can be pumped from the tank. A portion of the waste in tank S-112 will not readily dissolve, requiring a different approach to remove the remaining 30,000 gallons of material still in the tank. "Retrieval of waste from S-112 has gone extremely well and our engineers, craft workers and operators have gotten the most possible out of this technology," Raymond said. "This tank has a layer of hardened material at the bottom that requires a different approach to retrieve it."

Under the terms of the Tri-Party Agreement, waste retrieval must continue until at least 99 percent of the waste is removed or the limits of technology have been reached, whichever leaves the least amount of waste in the tank at completion.

"We know we have more work to do in this tank and are now searching for innovative technologies that will help us achieve our objective," Raymond said.

Workin' on the Railroad Reduces Waste-Handling Costs

"We are trying to give ourselves more maneuverability in how we handle waste," said Ty Blackford, CH2M HILL Director of Waste Services. He was explaining an initiative now being tested to use Hanford rail lines for shipping large waste items from the 200 Area to a treatment site operated by Pacific EcoSolutions, or PEcoS, in north Richland.

In the past, most large items classified as low-level waste or mixed low-level waste had to be disassembled or cut into smaller pieces, packaged for shipment by truck, and unpackaged at the PEcoS facility. It was costly and time-consuming. Beginning last January, CH2M HILL re-evaluated the waste handling processes in an attempt to find a better way — one that wouldn't involve the same amount of labor and risk.

The ideas that emerged from discussions with several industry organizations were mostly disappointing — business-as-usual proposals involving variations of traditional packaging and trucking methods. However, PEcoS and representatives of the Tri-City & Olympia Railroad Company (TCRY), which manages the formerly government-owned rail lines on the Hanford Site for the Port of Benton, took the time to interface with CH2M HILL and partner on some alternative ideas. The result was a proposal to use the rail system and a specialized railcar for oversized contaminated equipment.

The railroad company agreed to obtain a car, modify it, get it certified and obtain the necessary approvals from federal and state regulatory agencies. CH2M HILL agreed to open the rail lines in the 200 West Area, while PEcoS agreed to facilitate the off-loading at their facilities. "There was no cost to CH2M HILL or the government for supplying and equipping the car," Blackford said.

This special railcar that can be loaded from the top was modified by the Tri-City & Olympia Railroad, which manages Hanford rail operations for the Port of Benton, to transport CH2M HILL waste. After state and federal certifications were received, the car made its first test run on June 7.

"The Tri-City & Olympia Railroad is pleased to offer to CH2M HILL Hanford Group the nuclear waste transportation alternative afforded by rail," said Dave Samples, Director of Business Development for TCRY. "As a small business headquartered in Richland, we share in the desire to achieve site cleanup in a safe, cost-effective, and timely manner, and transporting materials via rail will make a major contribution."

Opening the rails proved to be a challenge, as about 200 yards of track was closed in 200 West because of a contaminated area. With excellent cooperation between Waste Services Operations and the Radiation Control organization, the rails were functional within two weeks of the discovery.

Finally, on June 7, several large contaminated control panels left over from saltwell tank pumping were loaded and shipped to the PEcoS facility. Waste Services estimates that the cost to reduce the size of these panels for traditional packaging and truck transport would have been $57,000. The actual cost was around $16,000, saving $41,000. CH2M HILL expects to realize similar cost savings with each future shipment and is actively pursuing increased capabilities to support tank closure and cleanup projects.

"Everything about that test shipment went pretty much as planned," said Waste Services Transportation and Packaging Manager Jim McGrogan. "With this special railcar, there's no disassembly required for most large waste items — that's why, for these types of shipments, rail is the preferred mode of transportation in the waste cleanup industry."