Closing in on Closure

Containers for sludge installed in K East Basin

Construction workers last week finished installing the fourth and last container for collecting sludge in the K East Basin, at the same time that they installed the third of six collection containers in the K West Basin. Sometimes known as "sludge tanks" or "sludge liners," the large stainless steel containers will hold the sludge until a treatment system begins operating in late 2006.

In the K East Basin, the first two underwater tanks have been receiving sludge since last autumn. Workers installed the third tank several weeks ago after overcoming several unexpected issues. Most importantly, retrieving sludge and debris from the K East Basin's "weasel pit" was much harder and took much longer than anticipated. The "weasel pit" is an extension on the basin's southeast side where the last collection container sits. The weasel pit's sludge and unanticipated quantities of debris hid an uneven mound of grout (a special type of cement) in the spot where some of the legs and supports of the largest tank needed to rest. Once the grout mound was discovered, engineers had to modify the design to use a hanger system to support one portion of the collection tank.

"These unexpected challenges, along with extremely poor visibility in the K East Basin water, took our time and our energies, and added enormous complications to the job," said Randy Adkins, construction director for the K Basins Closure (KBC) Project. "However, as a team, we methodically examined and solved each problem that we met. The fact that we succeeded and now have four tanks operating to collect sludge in the K East Basin is a tribute to the excellent project teamwork that included engineering, procurement, construction, facility management, quality assurance, nuclear safety, radcon, and project operations."

In the K East Basin, sludge is vacuumed through long hoses and discharged into each container through a "distributor," which consists of a small cylindrical plenum with eight "elbows" attached around the circular head. The distributor reduces the speed at which the sludge is pumped to enhance settling, and provides more uniform distribution of sludge in the container. A "settler tube" assembly, consisting of a plastic honeycomb of triangular tubes, sits at the top of each container to help small particles settle out, retain the finer particles, and spread out the flow of water as it leaves the container during pumping.

Three of the collection containers in the K East Basin are sized to each hold nine cubic meters (nearly 12 cubic yards) of sludge, but the last tank is larger and will hold up to 14 cubic meters (over 18 cubic yards). Operators have so far contained 48 cubic yards of sludge, all of it in the K East Basin. This volume represents 70-percent of the sludge in both K Basins. Sludge-retrieval operations have not yet begun in the K West Basin.

Completing the difficult installation work frees space in the congested K East Basin, allowing other work to go forward there, including installation of a special hose-in-hose transfer system that will pump sludge out of the basin. Construction forces are also planning to finish installing all six of the 11-cubic meter (14.7-cubic yard) sludge-collection tanks in the K West Basin by the end of June. ■

Michele Gerber, Communications

KBC

Sludge coated debris at the bottom of the KE Basin (left) before sludge removal began. Fluor Hanford crews pump sludge out of the KE Basin (right) and the sludge-bearing water is opaque during pumping operations (center).

Other KBC Project news

At the K West Basin

In late May, Fluor Hanford nuclear chemical operators completed a three-year effort of removing over 7,200 contaminated fuel canisters from the K West Basin. The crews, working under project manager Rob Gentry, have also removed more than 4,000 contaminated canister lids, 200 pole tools, and approximately 130 large racks from K West Basin water.

At the Canister Storage Building

The highly successful welding team working under Jerald Kinz has already welded permanent cover caps on more than half of the 18 Shippingport Spent Fuel Canisters stored at the Canister Storage Building.

At the K East Basin

Fluor Hanford crews working under Jim Gamin have completed retrieving sludge from the K Basin's North Loadout Pit (NLOP), and will transport the last of four loads to T Plant this week. "This is an invigorating time," said Scott Sax, sludge director for the KBC Project. "We are completing the first phase of sludge removal ... putting the finish on one of the most difficult projects we have faced. I want to thank each member of the NLOP team, and also want to pass on their thanks to the rest of the KBC project team members who supported them."

Sludge retrieval from the NLOP was the first operation to start and finish in Hanford's K Basins. When retrieval operations began a year ago, the small pit on the northwest end of the KE Basin held just over eight cubic yards (six cubic meters) of sludge. The NLOP sludge was slightly less radioactive (that is, it contained less uranium metal) than sludge in other parts of the K East Basin.

NLOP sludge was pumped into four containers known as Large Diameter Containers (LDCs). Each LDC is a large, specially engineered steel vessel that sat outside the basin on a transport trailer in an annex just north of the K East Basin. Retrieval proceeded using a cyclic batch-fill process. Sludge was pumped into the LDCs and allowed to settle. Periodically, vessel water was drawn off (decanted) from the vessel to concentrate the sludge.

At T Plant, the sludge from the NLOP will be mixed with grout and hardened for disposal as nuclear waste. ■