Retrieving solid waste from single-shell tanks

ORP and CHG are preparing to demonstrate technologies for retrieving two basic types of solid radioactive tank waste — “saltcake” and sludge — from Hanford’s aging single-shell tanks. The methods selected will use as little liquid as possible. The effort is the successor to an ongoing program to remove the liquid waste from the SSTs. That program, called interim stabilization, has moved liquid waste from 128 of the 149 single-shell tanks to newer, safer double-shell tanks. While the solids remain, removing the liquid reduces the possibility of leaks.

Saltcake, with the consistancy of wet beach sand, was created when tank liquids were processed in evaporation facilities over the decades. Retrieving saltcake waste will involve dissolving the waste with a liquid so it can be pumped out of the tank.

A regulatory milestone calls for ORP to remove enough waste with dilution water to fill at least 2 million gallons of double-shell tank space before October 2006. Tanks S-102 and S-112 were picked as the first tanks for saltcake removal because they have significant amounts of contaminants and haven’t leaked in the past.

DOE and the Washington State Department of Ecology wanted to start with sound tanks to demonstrate retrieval technologies. Also, the retrievable liquid has been removed from all but one of the 67 single-shell tanks that may have leaked in the past, and work to remove the liquid from that tank is under way.

Another consideration was adequate infrastructure, such as electricity to run pumps. The S Tanks are close to a staging point for transfers across the site, so crews will be able to install temporary over-ground transfer lines instead of relying on older buried pipes. Double-shell tank SY-102 serves as a staging point for waste transfers to Hanford’s 200 East Area, where a planned treatment facility will mix the waste with glass.

A different type of technology will be needed to remove sludge, which looks like fine mud and dries very hard. It tends to be hard to dissolve in most liquids.

Tank C-104 was selected for the first sludge retrieval demonstration because it holds about 263,000 gallons of radioactive sludge and more plutonium than any other Hanford tank. In fact, it holds nearly a quarter of all the plutonium found in all 149 single-shell tanks.

Much of the infrastructure needed to build a waste retrieval system in the tank is already in place because of efforts to solve a high-heat issue in nearby Tank C-106 in 1998 and 1999.

ORP is required by the Tri-Party Agreement to do a “cold mock-up,” or test, of the sludge retrieval technology and to construct a retrieval system in a tank by 2007. ❖