FACT SHEET

Defense Waste Processing Facility

The only operating radioactive waste glassification plant in the nation, the Defense Waste Processing Facility (DWPF) converts the radioactive liquid waste currently stored at the Savannah River Site (SRS) into a solid glass form suitable for long-term storage and disposal.

Scientists have long considered this glassification process, called "vitrification," as the preferred option for treating radioactive liquid waste. By immobilizing the radioactivity in glass, DWPF reduces the risks associated with the continued storage of liquid waste at SRS and prepares the waste for final disposal in a federal repository. About 35 million gallons of liquid waste is now stored in 43 underground carbon-steel tanks at SRS. This waste has about 263 million curies of radioactivity, of which the vast majority will be vitrified at DWPF.

Construction of DWPF began in late 1983, and it began radioactive operations in March 1996. To complete its waste vitrification mission, DWPF is projected to produce approximately 8,170 canisters.

Waste Feed

The liquid waste in tank storage exists in essentially two forms: a sludge form and a salt form. DWPF is designed to treat the high-activity radionuclides from both forms of this waste. The sludge form, while comprising only about seven percent of the volume in the tanks, contains about 47% of the radioactivity. The salt form comprises about 93 percent of the volume and contains the balance of the radioactivity. Before being sent to DWPF, the salt waste will be treated at the Salt Waste Processing Facility (SWPF), once operational. SWPF will process the majority of the salt waste inventory at SRS. Until SWPF is operational, interim salt waste processing will be conducted via the Modular Caustic Side Solvent Extraction Unit (MCU) and the Actinide Removal Process (ARP), both located in H Tank Farm.

Savannah River Remediation LLC manages the Savannah River Site's Liquid Waste contract for the U.S. Department of Energy. SRR is dedicated to the reduction of risks through safe stabilization treatment, and disposition of legacy radioactive waste.

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DWPF Operations

DWPF is vitrifying sludge from the radioactive liquid waste currently in tank storage along with the cesium and strontium from the salt forms in the waste. In this process, a sand-like borosilicate glass (called "frit") is mixed with the waste and sent to the plant's 65-ton steel and ceramic melter. In the melter, electricity is used to heat the waste/frit mixture to nearly 2,100 degrees Fahrenheit until molten. This molten glass-waste mixture is poured, in a pencil-thin stream, into stainless steel canisters to cool and harden.

Each canister is 10 feet tall and 2 feet in diameter, and it typically takes about a day to fill one canister. A filled canister weighs about 5,000 pounds.

After filling, the exterior of each canister is blasted with a frit-water mixture to remove any surface contamination. A stainless steel plug is fitted into the neck of each filled canister, and the canister is welded shut using an electrical current of 250,000 amps applied for 1.5 seconds, while 80,000 pounds of force simultaneously presses the plug into the neck of the canister. The resulting weld is as strong as the three-eighths-inch thick stainless-steel canister itself.

Temporary Storage

A specially designed vehicle, called the Shielded Canister Transporter, moves each sealed canister, one at a time, from DWPF to one of two Glass Waste Storage Buildings (GWSB) adjacent to the facility. This transporter, more than 18 feet tall, 25 feet long and weighing 235,000 pounds, is a two-wheel drive vehicle powered by redundant diesel engines. It has a center module with a shielding cask, floor plug cavity and associated canister lifting equipment. At DWPF, the transporter draws canisters up into the shielded cask for the short trip to the storage building.

At the storage buildings, canisters are lowered by the transporter into an underground reinforced concrete vault. In these seismically qualified vaults, SRS has the capacity to safely store about 6,844 canisters, which includes double stacking in GWSB 1. The canisters are temporarily stored at SRS until a federal repository is established.

Please visit https://www.youtube.com/watch?v=rESXUcSeQYU for more information about DWPF.

SRR is the Liquid Waste contractor at SRS, which is owned by the U.S. Department of Energy. SRR is composed of a team of companies led by AECOM with partners Bechtel National, CH2M, and BWX Technologies, Inc.

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