Hanford Vit Plant

HIGH-LEVEL WASTE VITRIFICATION FACILITY

January 2016

The Hanford Site, located in southeastern Washington state, was used to produce plutonium over 40 years, helping end World War II and playing a major role in defense efforts during the Cold War. As a result, 56 million gallons of radioactive and chemical wastes are now stored in 177 underground tanks on the Hanford Site. To address this challenge, the U.S. Department of Energy contracted Bechtel National, Inc., to design and build the world's largest radioactive waste treatment plant.

The Hanford Waste Treatment and Immobilization Plant, also known as the Vit Plant, will use vitrification to immobilize most of Hanford's waste. Vitrification involves turning the waste into a solid glass form that is stable and impervious to the environment. In this form, its radioactivity will dissipate over hundreds to thousands of years.

CONSTRUCTION FACTS

Size: 440 feet by 275 feet by 95 feet tall

Concrete: 88,000 cubic yards

Structural steel: 11,500 tons

Heating and ventilation ductwork: 1,142,000 pounds

Piping: 165,000 feet

Electrical cable: 1,610,000 feet

Craft hours to build: 5,251,000 hours

HLW Facility

The Hanford Waste Treatment and Immobilization Plant will cover 65 acres with four nuclear facilities – Pretreatment, High-Level Waste Vitrification, Low-Activity Waste Vitrification and an Analytical Laboratory – as well as operations and maintenance buildings, utilities and office space.

The waste treatment process will begin in the Pretreatment Facility, where waste will be divided into high-level solids and low-activity liquids. From there, the high-level waste will be transferred via underground pipes to the High-Level Waste Vitrification Facility, also known as the HLW Facility. When complete, the HLW Facility will be 440 feet long and 275 feet wide, approximately the size of three football fields, and 95 feet, or six stories, high.

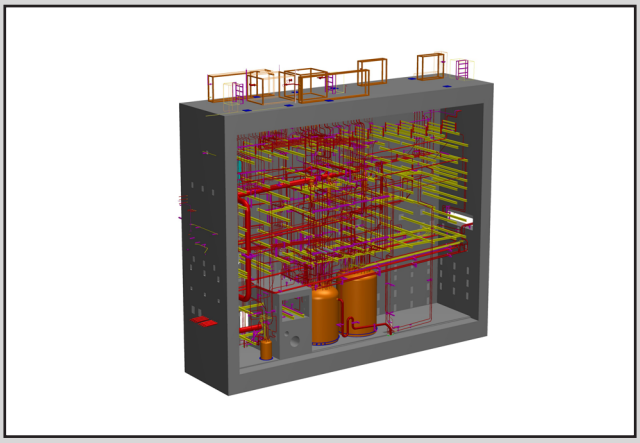
In the HLW Facility, high-level waste will be mixed with glass-forming materials in two 90-ton melters and heated to 2,100 degrees Fahrenheit. The mixture will then be poured into stainless steel canisters that are approximately 2 feet in diameter, 14.5 feet tall and weigh more than 4 tons. When fully operational, the HLW Facility will produce an annual average of 480 canisters.

The full canisters will be temporarily stored at a canister storage facility in Hanford's 200 Area. Eventually, they will be shipped to a federal repository for permanent disposal.

A CLOSER LOOK INSIDE THE HIGH-LEVEL WASTE FACILITY

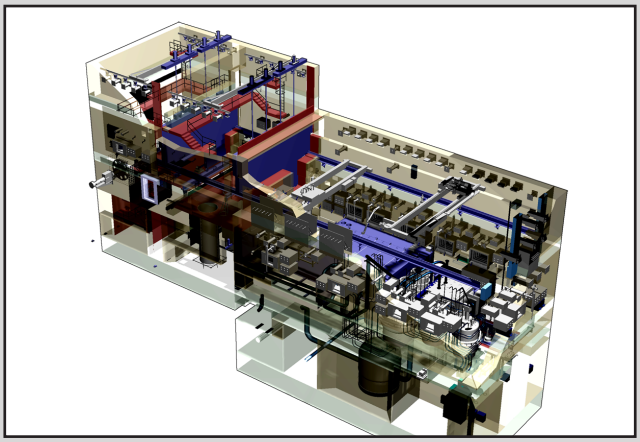
THE WET CELL

High-level waste arrives from the Pretreatment Facility in the wet cell. The cell rests inside a facility black-cell area, behind steel-laced, high-strength concrete walls, and is inaccessible to workers. Once inside the High-Level Waste Vitrification Facility, the pretreated waste is transferred through shielded pipes into a series of melter preparation and feed vessels before reaching the melters. Liquids from various facility processes also return to the wet cell for interim storage before recycling back to the Pretreatment Facility.



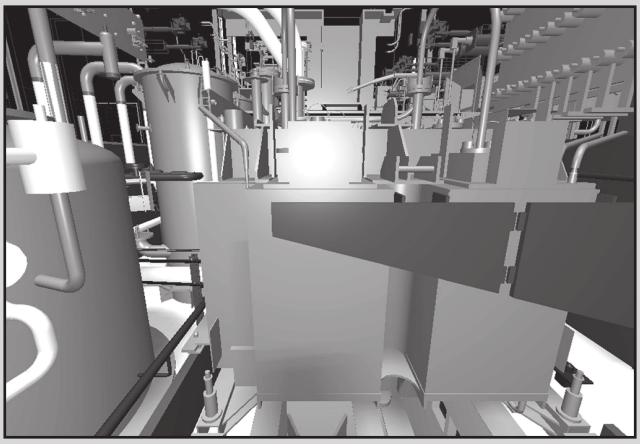
THE MELTER CELL

The facility contains two identical, remotely operated melter caves. Due to potential high levels of radioactivity in the caves, all operations and maintenance activities are performed using remote-handled large overhead cranes and manipulators. Each cave contains a series of complex utilities to support two high-level waste vitrification melters. The melters are supported by offgas cleaning systems that include a submerged bed scrubber vessel and two high-efficiency mist eliminators.



PRODUCTION AND OPERATIONS

Two identical 90-ton melters, each 14 feet by 14 feet and 11 feet high, will produce a sturdy glass product that consists of about 30 percent waste and 70 percent additives. The facility will annually produce an average of 480 canisters.



High-Level Waste Vitrification Facility
(Elevation 0'-0")