Hanford Vit Plant

PRETREATMENT 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: 540 feet by 215 feet by 120 feet tall

Concrete: 114,000 cubic yards

Structural steel: 17,000 tons

Heating and ventilation ductwork: 1,796,000 pounds

Piping: 540,000 linear feet

Electrical cable: 1,491,000 feet

Craft hours to build: 8,200,000 hours

PT 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 Pretreatment Facility, also known as the PT Facility, is the first step in the process of vitrifying Hanford's tank waste. The PT Facility is the largest of the four major nuclear facilities that compose the Vit Plant. It is 540 feet long and 215 feet wide, the size of nearly four football fields, and 120 feet tall, or 12 stories, high. When complete, its total area will be more than 490,000 square feet.

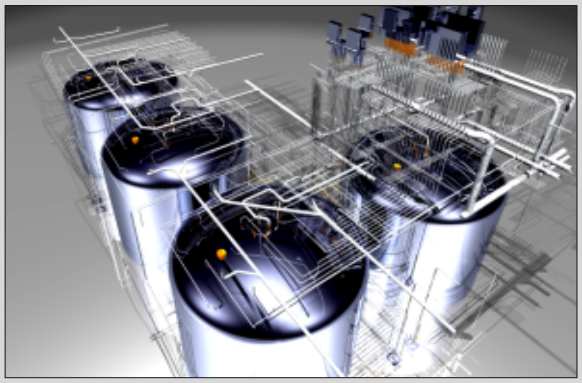
Waste will be pumped from the Hanford tanks via underground pipes to the PT Facility's interior waste feed receipt vessels. There, during the first phase of pretreatment, the waste will be concentrated using an evaporation process. Solids will be filtered out, and the remaining soluble, highly radioactive isotopes will be removed using an ion-exchange process.

The high-level solids will be sent to the High-Level Waste Vitrification Facility, and the low-activity liquids will be sent to the Low-Activity Waste Vitrification Facility for further processing.

A CLOSER LOOK INSIDE THE PRETREATMENT FACILITY

WASTE FEED RECEIPT VESSELS

Four waste feed receipt vessels, each with a 375,000-gallon holding capacity, are the first stop for Hanford's tank waste entering the Pretreatment Facility. The stainless steel vessels contain a series of internal pulse jet mixers to keep incoming waste properly mixed. The vessels are inside the facility's black cell areas, completely encapsulated behind thick steel-laced, high-strength concrete walls in an area inaccessible to workers.



PIPING MODULE ASSEMBLY

The Pretreatment Facility includes more than 100 miles of piping. Several on-the-ground piping modules are being fabricated while civil construction activities and vessel installations continue inside the building. The piping modules are an intricate assembly of piping spools and hangers attached to structural steel beams that will be placed inside the facility. The modules are being constructed on the ground to ensure worker safety and high quality standards.

45-FOOT-DEEP PIT AND TUNNELS

A 45-foot-deep pit and adjoining tunnels lie at the center of the Pretreatment Facility. The pit is a collection point for any potential overflows from piping inside the underground tunnels during hot operations. It is a made of steel-laced, high-strength concrete and lined with 1/8-inch stainless steel. The pit is also a secondary overflow unit for two 60-ton stainless steel vessels at the bottom of the pit. One vessel collects overflow from the Pretreatment Facility's primary storage tanks; the other vessel collects liquids from the High-Level Waste Vitrification Facility and Analytical Laboratory drains.