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Hanford Waste Treatment Plant Project's Analytical Laboratory mechanical systems design completed

Richland, Wash. -- Engineers working on the Hanford Waste Treatment Plant (WTP), also known as the "Vit Plant," recently completed the mechanical systems design for the Analytical Laboratory (Lab), one of the five major nuclear facilities that compose the Vit Plant, bringing the facility another step closer to startup activities in 2013.

When operational, the Lab will be a unique facility that will annually process 10,000 samples, taken and analyzed from throughout the vitrification process, to ensure a high-quality glass product and strong process controls. Analysis will also confirm the glass meets all regulatory requirements and standards.

This is the first of the Vit Plant facilities to complete the mechanical systems design, and marks a nine-year effort to design a series of complex systems and components.

"This accomplishment is important because it fully enables the other engineering disciplines -- from electrical and plant equipment to controls & instrumentation and plant design -- to forge ahead in their efforts to complete the design of the Lab," John Schneider, area engineering manager for the Low-Activity Waste Vitrification Facility, Balance of Facilities and Lab, said.

The milestone was met when the last piping & instrument diagram (P&ID), and associated calculations, were confirmed. Approximately 70 P&IDs compose the facility's mechanical systems design, and each P&ID is supported by more than 20 detailed calculations. P&IDs are relatively high-level diagrams of an entire mechanical system, including all the required piping, valves, coils and pumps. The diagrams lay out the system, identify system components and specify part and equipment sizes. Supporting calculations call out pressure, flow and temperature requirements. Other engineering disciplines then use the data from the P&IDs as the basis for their more-specific designs.

When complete, the Lab will contain 35,000 feet of piping. Work on the Lab's mechanical systems design began in late April 2001. The overall design of the Lab is currently 81 percent complete.

"This is the culmination of many years of effort and is a significant step forward for the project," Heidi Schuette, deputy area project engineering manager, said. "Engineering's completion of the Lab mechanical systems design is one of the key activities for moving the project to construction completion and startup."

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Bechtel National, Inc. is designing and building the world's largest radioactive waste treatment plant for the U.S. Department of Energy at the Hanford Site in southeastern Washington state. The \$12.2 billion Waste Treatment and Immobilization Plant (WTP), also known as the "Vit Plant," will immobilize the radioactive liquid waste currently stored in 177 underground tanks using a process called "vitrification."

Vitrification involves blending the waste with molten glass and heating it to high temperatures. The mixture is then poured into stainless steel canisters. In this glass form, the waste is stable and impervious to the environment, and its radioactivity will dissipate over hundreds to thousands of years.

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

Construction of the WTP began in 2001 and is now 55 percent complete. The plant will be operational in 2019.



The Analytical Laboratory will be used to take and analyze approximately 10,000 samples, from throughout the vitrification process, to ensure a high-quality glass product and strong process controls. Analysis will also confirm the glass meets all regulatory requirements and standards.

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