PROGRESS AT THE HANFORD VITRIFICATION PLANT

A publication for the Hanford Waste Treatment Plant Project

May 2009

The Pretreatment Engineering Platform is a quarter-scale demonstration facility that was used to confirm key vit plant pretreatment processes.

PRETREATMENT ENGINEERING PLATFORM TESTING IS COMPLETED

The Waste Treatment Plant (WTP) Project recently completed advanced testing, known as "phase one" testing, at the Pretreatment Engineering Platform (PEP). The confirmatory testing provided additional confidence in key pretreatment processes that will be used when the WTP is operational.

The PEP is a quarter-scale demonstration facility of two waste pretreatment processes: ultrafiltration, separating waste solids and liquids; and leaching, dissolving elements necessary to divide the low-activity from the high-level waste to minimize the number of costly high-level waste canisters produced. Although these processes were previously proven at a laboratory scale, the PEP provided a bridge between the laboratory and full-scale operations.

Phase one testing, which began in late January 2009, confirmed that the ultrafiltration process will effectively separate the solid and liquid waste, and the leaching process will dissolve a sufficient amount of aluminum to reduce the amount of high-level waste glass produced. Tests were conducted on simulant, non-radioactive waste. The simulant was developed based on a carefully selected combination of materials and chemicals designed to portray Hanford tank waste that would challenge these pretreatment processes.

By confirming the ultrafiltration and leaching processes, the WTP Project will be able to close one of the last two major technical issues that were raised by the External Flowsheet Review Team (EFRT) in 2006. The other issue is being addressed by the M3 Mixing Test Platform (see page 4).

The PEP, which is roughly the size of a basketball court and two levels high, was designed and fabricated by a company in Carlsbad, N.M. Phase one testing has been a collaborative effort between the U.S. Department of Energy's Office of River Protection (DOE-ORP), the WTP Project and Pacific Northwest National Laboratory. With the completion of testing at the PEP, DOE-ORP and WTP expect to close this technical issue in September 2009.

OVERVIEW

Currently, 53 million gallons of radioactive and chemical waste are stored in 177 underground tanks on the Hanford Site in southeastern Washington state. A deadly legacy from the World War II and Cold War eras, an estimated one million gallons have leaked from at least 67 tanks, threatening the nearby Columbia River and the residents of surrounding communities.

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 (WTP), also known as the "vit plant," will use vitrification to immobilize most of Hanford's dangerous tank waste. Vitrification involves blending the waste with molten glass, heating it to high temperatures, then pouring it into stainless steel canisters. In this glass form, the waste will be stable and impervious to the environment, and its radioactivity will dissipate over hundreds to thousands of years.

WTP spans 65 acres and includes four nuclear facilities -- Pretreatment, Low-Activity Waste Vitrification, High-Level Waste Vitrification and an Analytical Laboratory -- as well as operations and maintenance buildings, utilities and office space.

Approximately 3,000 people are employed by Bechtel National, Inc. and its subcontractors. Construction of the WTP began in 2002. The plant will be operational in 2019.

TED FEIGENBAUM NAMED NEW WASTE TREATMENT PLANT PROJECT DIRECTOR

Feigenbaum brings 36 years of experience in the nuclear industry to the project.

The WTP Project announced Ted Feigenbaum as its new project director, effective May 1. In this position, Feigenbaum is responsible for managing the $12.2 billion nuclear waste cleanup project. Feigenbaum replaces Bill Elkins, who served as project director since early 2006. Elkins is retiring.

Feigenbaum brings 36 years of nuclear experience to the WTP Project, including experience in the commercial nuclear power industry and with the U.S. Department of Energy. He served as president and chief nuclear officer at Maine Yankee Atomic Power Company, where he was responsible for decommissioning a 25-year-old, 900-megawatt commercial nuclear facility, and as executive vice president and chief nuclear officer at the Seabrook Nuclear Power Station, a 1,200-megawatt commercial nuclear facility on the New Hampshire coast.

In 2005, Feigenbaum joined Bechtel as the president and general manager of Bechtel SAIC Company, LLC (BSC), where he was responsible for overseeing the design and preparation of the licensing application effort for submittal to the U.S. Nuclear Regulatory Commission for the Yucca Mountain repository in Nevada. BSC achieved the license submittal in June 2008.

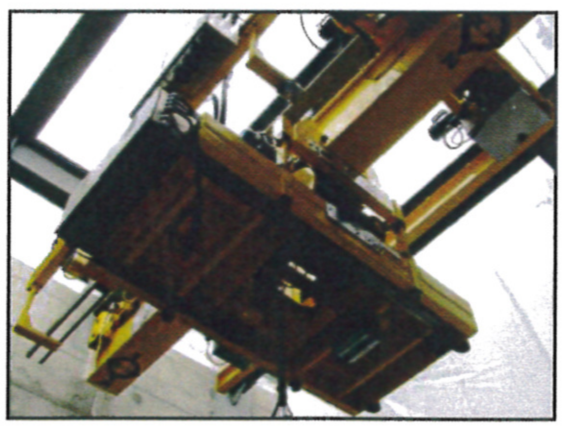
Feigenbaum joined the WTP Project as deputy project director in January 2009. In the past few months, he has taken on a wide range of project management activities focusing on closing challenging technical issues and improving cost and schedule performance, which are critical to this complex and important project.

20,000-POUND BRIDGE CRANE INSTALLED IN PRETREATMENT FACILITY

In March, crews at the Pretreatment (PT) Facility finished setting a two-ton capacity, ceiling-mounted bridge crane. The crane is located in the facility's spent-filter drum-handling (SFDH) room on the south side of the building, just under the PT Facility filter cave.

The 20,000-pound crane is 9 feet tall, 10 feet long and 16 feet wide. It will be remotely operated through a viewing room adjacent to the SFDH room and will process an average of one spent filter a day.

When operational, the crane will handle spent high-efficiency particulate air (HEPA) filters from the filter cave. The filters will be lowered into a 55-gallon drum in the SFDH room by a crane in the filter cave above. The SFDH crane will then process the drum before lowering it to a transporter below.



The bridge crane weighs 20,000 pounds, stands 9 feet tall and spans 10 feet in length and 16 feet in width. The crane will be used to handle spent HEPA filters from the Pretreatment Facility's filter cave.

The PT Facility is the first step in the waste treatment process of vitrifying Hanford's tank waste. Waste will be separated into high-level solids and low-activity liquids before being transferred via underground pipes to the appropriate vitrification facility.

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HIGH-LEVEL WASTE FACILITY COMPLETES CONCRETE AT 0-FOOT ELEVATION

At the end of April, crews at the High-Level Waste (HLW) Facility reached a milestone when they completed the final concrete pour for the facility's 0-foot elevation. The pour, which took place in the morning, was on the north side of the facility. This is the second floor to be completed in the HLW Facility; the first floor that was completed is 21 feet below ground level.

To complete the 0-foot elevation floor, HLW crews poured 183 cubic yards of concrete. The HLW Facility will include a total of 88,000 cubic yards of concrete and six floors when it is finished. It will be one football field long, three football fields wide and six stories high.

When operational, the HLW Facility will process high-level waste by mixing it with glass-forming materials in two 90-ton melters and heating it 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.

Crews at the High-Level Waste Facility finished pouring concrete at the 0-foot elevation in late April.

WASTE TREATMENT PLANT CONSTRUCTION SITE EMPLOYEES ACHIEVE DOE VOLUNTARY PROTECTION PROGRAM MERIT STATUS

Construction site employees were presented with the Merit flag on April 20.

On April 20, employees at the WTP construction site celebrated the honor of earning the Department of Energy's (DOE's) Voluntary Protection Program (VPP) Merit status, recognizing employee excellence and leadership in safety and health. DOE Office of River Protection Manager Shirley Olinger presented WTP site employees with the Merit status flag and a framed plaque during the celebration.

The WTP's VPP Steering Committee, composed of onsite non-manual and craft workers, completed and submitted the construction site's VPP application last fall. A team of DOE safety and health experts then performed a week-long onsite evaluation of work practices throughout all areas of the site and interviewed employees and managers to assess their knowledge of VPP processes. That assessment resulted in a recommendation to award Merit status to the WTP Project.

Similar to the Occupational Safety and Health Administration's VPP program, DOE VPP provides several proven benefits to participating sites, including improved labor/management relations, reduced workplace injuries and illnesses, increased employee involvement, improved morale, reduced absenteeism and public recognition. Due to the the type and complexity of DOE facilities, the VPP program also includes coverage of radiation protection/nuclear safety and emergency management.

There are approximately 1,500 employees located at the 65-acre construction site.

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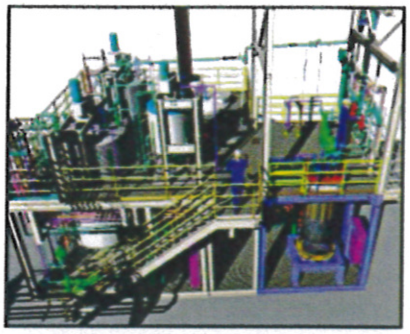
M3 TESTING PLATFORM WILL BE USED TO CONFIRM MIXING TECHNOLOGY



The M3 Mixing Test Platform will be used to confirm the effectiveness of the vit plant's pulse jet mixers.

The last components of a new WTP testing platform arrived in Richland, Wash., at the end of April. The M3 Mixing Test Platform will confirm the effectiveness of pulse jet mixers (PJMs), an essential waste mixing technology that will be used at WTP. Composed of six large components, known as "skids," the M3 Mixing Test Platform is 36 feet long, 24 feet wide and stands more than 12 feet tall.

Fabricated in Carlsbad, N.M., by the same company that manufactured the Pretreatment Engineering Platform (PEP), the M3 Mixing Test Platform will include two utility skids and four process skids. The process skids include five vessels and two clusters of PJMs, as well as support equipment such as agitators, pumps and instrumentation.

When operational, WTP will use PJMs to mix the waste being processed through the Pretreatment (PT) and High-Level Waste (HLW) Vitrification facilities. Mixing is essential to the waste treatment process to ensure that waste can be moved from vessel to vessel and to prevent solids from settling.

PJM clusters will be installed in 25 vessels in the PT Facility, as well as two in the HLW Facility. The number of PJMs in an array will range from one to a dozen, depending on the purpose and size of the vessel. Vessels used early in the pretreatment process require more PJMs, due to the nature of the waste, than those used later in the process. Larger vessels require more mixers than smaller ones.

The M3 Mixing Test Platform, like the PEP, is being built in response to a comprehensive independent review of the WTP design conducted by the External Flowsheet Review Team (EFRT) in 2006. The team was composed of fifty experts from national laboratories, universities, the nuclear waste complex, the chemical processing industry and the glass industry. It included members from the National Academy of Engineers (NAE) and the National Academy of Science (NAS). The EFRT recognized the operability of the PJMs but felt further confirmatory testing was needed to ensure the PJMs provided the necessary mixing for the WTP. The platform testing will resolve the last major technical issue identified by the EFRT.

Testing is scheduled to be completed this fall.

WTP QUICK FACTS

- WTP construction is currently 47 percent complete.
- It is the largest nuclear construction project in the United States today.
- It is the first nuclear facility to be built in the United States in decades, requiring a re-establishment of the nuclear supply chain.
- It requires a total of 262,000 cubic yards of concrete, more than 4 million feet of electrical cable and more than 1 million feet of piping.

ADDITIONAL INFORMATION

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