HANFORD

Vit Bits

Progress news about the Hanford Vit Plant in Washington State

SPECIAL EDITION: Journey to Melter Heatup

An Environmental Solution

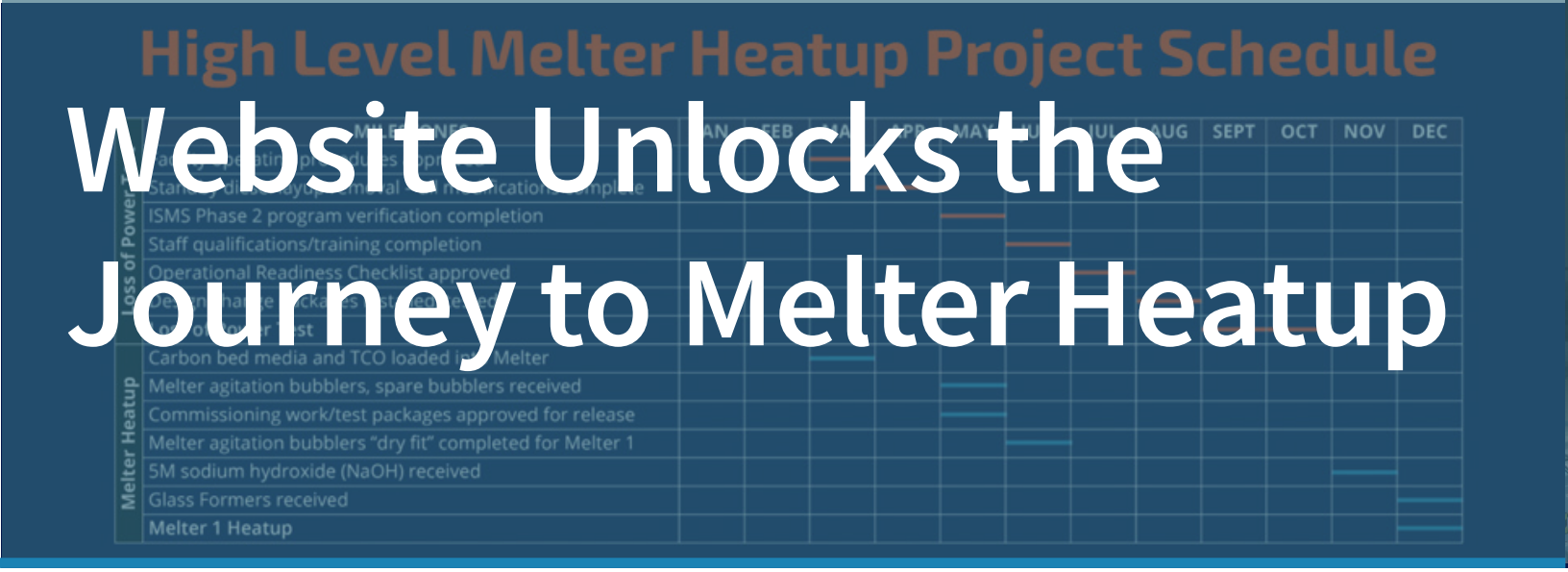
When complete, the Vit Plant will stabilize the legacy radioactive and chemical waste stored at the Hanford Site in aging underground tanks. The plant will use vitrification technology to mix the waste with glass-forming chemicals and heat it to high temperatures. The mixture will then be poured into stainless steel containers to cool and solidify, protecting the nearby Columbia River and surrounding communities. For more information, see page 4.

In This Issue

At a Glance

Heating the melters (pictured left) to 2,100 degrees Fahrenheit is an important step in the Vit Plant's commissioning process. It will take approximately two months to heat up one melter.

This special edition highlights the melter heatup process and how it contributes to reaching operations.



Website Unlocks the Journey to Melter Heatup

WHAT IS DIRECT-FEED LOW-ACTIVITY WASTE?

The Hanford Vit Plant was originally envisioned to treat high-level waste solids and low-activity waste liquids simultaneously. To begin treating waste as soon as practicable, the Department of Energy developed a sequenced approach that would allow the plant to begin treating waste as soon as 2023.

The approach is called Direct-Feed Low-Activity Waste (DFLAW) and involves sending low-activity waste directly from the Tank Farms to the Vit Plant's Low-Activity Waste Facility. For more information, see https://bit.ly/3iWBBKVREaching .

The Hanford Vit Plant is on a journey to heat up the first of two melters, which are considered the heart of the vitrification process. This is an important step in achieving direct-feed low-activity waste (see sidebar) in 2023.

Our Journey to Meltup Heatup website features information about commissioning, the loss of power test, melter heatup, the melters, and progress at the Vit Plant. For more information, see https://bit.ly/3mB79ay.

Richland Company Provides "Frit" for Melter Heatup

A material resembling small glass beads will serve as a critical ingredient to heating up the first melter. It is being provided by Fluid Controls and Components Inc. (FCCI) in Richland.

Glass frit is a mixture of chemicals that will mimic Hanford tank waste materials during the melter heatup process.

FCCI will provide 108,000 pounds of the frit. The frit will be used only during melter heatup. It mimics waste by dissolving into a solid form at high temperatures. During the heatup process, the glass frit will be flushed out of the melter with a simulated feed. For more information, see https://bit.ly/3BJsBjI.

Reaching 2,100 Degrees: Steps to Melter Heatup

Heatup of a melter in the Low-Activity Waste Facility consists of a series of activities to prepare for and establish a molten pool of glass inside the melter. It takes approximately two months to heat up one melter (approximately 22 days for the initial heatup, followed by several days of testing, followed by about 30 days of checkout).

Initial Heatup: Once the empty melter is heated to temperature using temporarily installed startup heaters, quantities of ground glass – called frit – are added until enough melted glass is present to cover the melter's electrical heating electrodes.

Energizing the Melter: The normal melter power supplies are energized, flowing electricity through the glass pool to generate heat, like a toaster heating element, and the temporary heaters are removed.

Bubblers are Installed: Next, bubblers are installed to introduce air into the bottom of the melter glass pool to mix the glass.

More Glass Frit is Added: More glass frit is added to raise the pool to the normal operating level, and then the melter is ready to start receiving tank waste feed materials (non-hazardous simulant will be used during testing).

Minimizing Risk: The first melter will be heated up, commissioned and verified operational before the second melter is heated and tuned. This two-phase process reduces risk and enables lessons learned from the first melter heatup to be incorporated into plans for heating up melter 2.

Offgas Tuning and Testing: Upon heatup of the second melter, the melter and associated exhaust, known as offgas, and support systems will concurrently be verified operational.

Timing of Heatup: The melters are heated up during the commissioning phase to ensure all testing of systems feeding into and out of the melter, and the melters themselves, are verified ready to start. It also allows for the melters, which have a design life of about five years, to maximize the time expended in operations treating tank waste.

WHEN WERE THE FIRST MELTERS INSTALLED?
The first melter assembly was completed in May 2017, and the second melter assembly was completed in August 2017.

HOW LONG AFTER MELTER HEATUP UNTIL START OF OPERATIONS?
In the current schedule, the Operational Readiness Review for start of operations is 14 months after Melter 1 Heatup is completed. The Commissioning Test Planning Schedule lists 40 activities that must be completed from Melter 1 Heatup to initiation of tank waste into the facility. This important commissioning work takes approximately one year to complete.

WILL THE MELTERS STAY ON ONCE THEY ARE HEATED UP?
Yes. Melters have a life span of approximately five years; once they are heated up, they will remain on and maintain a pool of molten glass until replacement.

For more information, including more FAQs, see https://bit.ly/3FGe8aU.

Journey to Melter Heatup Quick Bits

MELTER FACTS

- The Vit Plant melters are nearly five times larger than the 65-ton melter in operation at the Department of Energy Savannah River Site's Defense Waste Processing Facility in South Carolina.
- The melters are approximately 20 feet by 30 feet and 16 feet high, and, when in use, will be the largest waste glass melters in the world.
- For more information, see https://bit.ly/3oVRO7b.

What is Commissioning?

Commissioning is the fourth of five steps to complete the Vit Plant (Engineering, Procurement, Construction, Commissioning, and Operations).

Commissioning is the process whereby constructed Vit Plant components and systems are verfiied and subsequently placed into service.

For more information, see https://bit.ly/3axHMAL.

What is the Loss of Offsite Power Test?

One of the last tests to perform before melter heatup is the loss of offsite power test. This test is performed to ensure the workforce – all four shifts and all personnel – perform as expected if the Plant experiences a loss of power during operations.

It is estimated to take up to an hour to complete immediate actions to restore power and set the stage for starting re-energization. Full restoration of power to all users may take several hours.

For more information, see https://bit.ly/3oU0nPQ.

About the Vit Plant

In Washington state, Bechtel National, Inc. is designing, constructing, and commissioning the world's largest radioactive waste treatment plant for the U.S. Department of Energy (DOE). When complete, the Hanford Tank Waste Treatment and Immobilization Plant, also known as the Vit Plant, will process and stabilize million gallons of radioactive and chemical waste currently stored at the Hanford Site.

The 56 million gallons of waste are a byproduct of national defense plutonium-production efforts during World War II and the Cold War era. It resides in 177 aging underground tanks and threaten the nearby Columbia River.

Under DOE's Direct-Feed Low-Activity Waste approach, the low-activity waste in those tanks will be treated and piped to the Vit Plant's Low-Activity Waste Facility, where it will be vitrified into a solid glass form that is safe and impervious to the environment.

Stay Up to Date on Vit Plant News

The journey to melter heatup is an important step in achieving Direct-Feed Low-Activity Waste and to treating Hanford's radioactive waste. Stay up to date on this upcoming milestone and learn about others:

Follow us on Facebook (@HanfordVitPlant). Be among the first to hear about new progress and accomplishments, learn more about the melters on Melter Mondays, and read stories about the skilled craft and professionals who are working hard to meet the Vit Plant's mission.

Visit HanfordVitPlant.com. The Vit Plant website features project news and information, including facility details and employee stories.

Community Corner: United Way

The Hanford Vit Plant recently completed its annual United Way Campaign, donating just over $195,000. The Vit Plant is committed to supporting the United Way of Benton & Franklin Counties, and Bechtel has also served as the premier sponsor of its annual the Festival of Trees gala. All proceeds go toward ending local hunger and homelessness.

This year, the Festival of Trees is scheduled for Saturday, November 20. For more, see https://www.uwbfco.org/festival-trees-2021.