

Vit Bits



Progress news about the Hanford Vit Plant in Washington State
December 2021



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At a Glance

The Vit Plant has partnered with vendors across the country to deliver a plant that will safely process Hanford's waste into a solid glass form. This issue highlights just a few of those key partnerships.

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 8.

Vit Plant and Petersen, Inc. Make a Winning Combination

Ogden

UTAH

Location: Ogden, Utah



WHAT ARE THE MELTERS?

The melters are known as the heart of the vitrification process. When operational, they will heat Hanford's low-activity waste and glass-forming chemicals to 2,100 degrees Fahrenheit before the mixture is poured into stainless steel containers to cool and solidify.

The melters measure 31 feet long, 22 feet wide, and 16 feet tall. Each melter weighs 350,000 pounds.

The melters are so intricate that the specifications for each melter include approximately 1,200 engineering drawings.

Each melter takes 2 to 3 years to build and has a design life of at least 5 years.

The first two melters were delivered to the Vit Plant in 2010.

The final containers are set to be delivered in October 2022 and the spare melter in summer 2022.

From humble beginnings in a garage, Petersen, Inc., has grown into a manufacturing and machining company that prides itself on complex fabrications, quality control and continuous improvement—including building critical equipment that will help treat nuclear waste and protect the environment.

Petersen built two of the incredibly complex melters and is also contracted to manufacture the containers, called Immobilized Low-Activity Waste containers, that will be used to dispose of the waste. One hundred of the 640 containers have been delivered to the Vit Plant in the past year.

"We have experience with high-temperature, high-alloy steels so we are familiar with high-temperature products," Rob Despain, vice president of business development at Petersen, Inc., said. "We also have an incredibly robust quality control system and talented team members with eons of experience. When we build a melter, we concentrate on one drawing at a time and it touches everyone. The entire team is involved."

Since their beginning in 1961, Petersen Inc. has grown to two facilities with 1.3 million square feet and 500 employees located in Ogden, Utah, and Pocatello, Idaho. Despain credits three things for the company's success: employee ownership, the Petersen Operating Way, and Going BIG, an initiative started by CEO Mark Jenkins several years ago.



"We work on continuous improvement," Despain said. "Even though we've been doing this a long time, we work every day to refine our process. The Petersen Operating Way is the way we operate, and it encompasses everything from procedures to how we deal with cleanliness and the way we process material."

In addition, Petersen believes in Going BIG, an appropriate name for the company that manufactured the largest melters in the world. Going BIG means 'Begin in Gratitude.' Meetings start with a safety share and employees sharing what they are grateful for. Their gratitude extends to working with Bechtel at the Vit Plant.

"It's been fascinating to understand the mission and goals of the Vit Plant and what they're trying to achieve," Despain said. "We're proud to be a contributor. We're grateful to work with people who are technically superior like Bechtel." For more information, see <https://bit.ly/328UWTB>.



Greenberry Industrial Provides Crucial Equipment for Vit Plant

Location: Vancouver Washington, and Corvallis, Oregon

From a one-of-a-kind battery system to six massive process vessels, Greenberry Industrial of Vancouver, Washington, has utilized technical expertise and nuclear know-how to provide complex equipment crucial to the Vit Plant and the broader nuclear industry.

“Greenberry Industrial has worked with us for the past 11 years, and their technical and engineering capabilities, as well as their commitment to safety and quality, have made them a trusted partner,” said Frank Salaman, Vit Plant procurements and subcontracts manager.

During their partnership, Greenberry has provided about \$20 million of equipment and services to the Vit Plant, often tackling significant technical complexities and challenges not typically required by commercial nuclear projects.



“We’ve done about 20 projects during our collaboration with the Vit Plant, including five or six one-of-a-kind projects,” said Mark Stapleton, vice president of engineering and nuclear services at Greenberry, which also has a facility in Corvallis, Oregon. “The uniqueness of these projects has given us the opportunity to showcase our industry-leading engineering and fabrication capabilities.”

Those one-of-a-kind projects include an uninterruptible electrical power system (UPS), the first of its kind ever used in a nuclear environment, that will provide backup power for the Low-Activity Waste (LAW) Facility, including the melters, in the unlikely event of a temporary power loss (see sidebar). The system is one of the plant’s vital safeguards and consists of seven racks of 196 batteries. The UPS automatically starts during a power loss to provide electricity to the LAW Facility, including the melter exhaust system and other critical safety systems.

Most recently, Greenberry fabricated six large-diameter alloy and stainless-steel corrosion-resistant process vessels for the Vit Plant. The vessels range in size from six feet tall and 24 feet in diameter to 45 feet tall and 14 feet in diameter, weighing in between one and 30 tons. The vessels will be used in the plant’s Effluent Management Facility, which handles secondary liquid waste, called effluent, generated by the LAW Facility’s melters and off gas treatment systems. The vessels required state-of-the-art welding processes and precision inspection of nozzles, attachments and vessel heads. For more information, see <https://bit.ly/3E0uGbB>.



WHAT WAS THE LOSS OF OFFSITE POWER TEST?

When offsite power was cut during the test, plant personnel activated backup power to keep critical safety systems operational while they worked through procedures to restore power to the plant.

WHY IS THE LOSS OF OFFSITE POWER TEST IMPORTANT?

The ability to restore power to the plant is critical. Two melters inside the plant’s Low-Activity Waste (LAW) Facility will immobilize radioactive and chemical waste in a glass form. Once a melter has reached its operating temperature of 2,100 degrees Fahrenheit, it must remain at temperature for its entire lifespan. If a melter were to cool and the glass inside became solid, the melter would need to be replaced. The first melter will be brought up to temperature in the next few months.

WHEN DID THE LOSS OF OFFSITE POWER TEST TAKE PLACE?

The test took place at the beginning of November. For more information, see <https://bit.ly/3IWpZ60>.



Inland Asphalt Provides Superlative Service at Vit Plant



Location: Richland, Washington

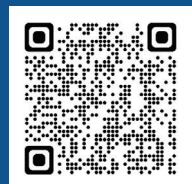
A LOOK BACK: FCCI

Known in the construction industry for their expertise with precision valves, Richland-based Fluid Controls and Components Inc. (FCCI) provided valves, piping, and piping components for Vit Plant construction. During the past five years, they've provided \$3 million of equipment for the project.

Last month's Vit Bits featured a story about FCCI sourcing 108,000 pounds of frit, a mixture of chemicals heated in a furnace to form glass, that will be used during the heatup of the Vit Plant's first melter. The melter is at the heart of a process called vitrification that transforms nuclear waste into an immobilized form safe for storage.

"Partners like FCCI are crucial to the success of the project," said Frank Salaman, Vit Plant procurements and subcontracts manager. "We rely on them to meet the complex specifications the project requires, and they've come through time and time again. Now the stakes are even higher as we initiate heating the first melter and using the frit in that process."

For more information, see <https://bit.ly/3s8vCZ7>.



Paving the equivalent of 18 football fields without disrupting operations is no easy feat, but that's what Inland Asphalt Company achieved at the Vit Plant.



"Inland Asphalt collaborated with the project team to coordinate activities and completed the work as promised, even in the unprecedented environment created by COVID-19," said Rick Holmes, general manager of the Waste Treatment Completion Company, which oversees the physical work at the Vit Plant and is a subcontractor to prime contractor Bechtel National, Inc.

The different paving jobs transformed the jobsite. The work included grading and paving 115,000 square yards of roadways, parking lots, and walkways around the 17 structures that support the Direct-Feed Low-Activity Waste program. To minimize disruption, the work was done in three phases of four to six weeks each from May 2020 to May 2021. The enhancements to the site improved traffic patterns and provided a safer environment for employees.

The Vit Plant incorporated walkways similar to bicycle paths adjacent to the roadways into the design, a safety improvement that segregates machines and pedestrians and provides a better walking surface for employees. During winter storms, the walkways can be cleared of snow at the same time plows clear the roads.



Completing the grading and paving took some coordination with other ongoing construction projects while also maintaining COVID-19 safety protocols.

"We had some coordination with other craft personnel onsite," said Steve Hanson, Inland Asphalt's project manager. "We had to work around them so their build could keep going."

The company's culture is centered around safety, which workers kept in focus to complete the paving without a single safety incident. Inland Asphalt was started in Spokane, Wash., and has since expanded to include an office in Richland, Wash. For more information, see <https://bit.ly/3s4f1Wi>.



Pacific Office Solutions Goes the Extra Mile for Vit Plant

Location: Richland, Washington

The owner of Pacific Office Solutions, Julie Valdez, has a simple business philosophy: Provide quick delivery, fair prices, and outstanding customer service. That's what she's done the past 15 years as a supplier for the Vit Plant.

"Pacific Office Solutions works with us to achieve the greatest cost savings, on-time delivery, and quality material deliveries," said Frank Salaman, Vit Plant procurements and subcontracts manager. "The outstanding customer service Pacific Office Solutions provides makes them a key supplier for the Vit Plant."

Valdez opened Pacific Office Solutions in 1990 in Yakima, Washington, an area classified by the Small Business Administration as a Historically Underutilized Business Zone, or HUBZone.

In addition to certification as a HUBZone small business, Valdez obtained purchasing agreements with the Department of Energy that offer competitive pricing for commonly used goods and services and expanded her business to local and state governments. She opened her doors in Richland, Washington, in 1995. Almost all of her 11 employees are women or members of an underrepresented group.

As Valdez's business has grown, so has her commitment to giving back. She mentors women business owners, helping them navigate how to do business with the government. She also has been a speaker at the University of Washington's Foster School of Business Supplier Diversity Club and Ascend Program.

The company's commitment to outstanding customer service made it easy for Vit Plant staff to order office supplies online via "shopping agreements" that allowed employees to order necessary supplies and receive them quickly. During the early days of the pandemic, when safety items like masks and gloves were scarce, the staff at Pacific Office Solutions helped the Vit Plant protect employees by finding a source for personal protective equipment.

She believes in giving back to her community and does so by supporting organizations involved with alleviating family hunger and teenage homelessness. She and her staff created an initiative five years ago called Serving Up Christmas, where they provide holiday dinners for families.

As one of her largest customers, the Vit Plant has had a hand in their success.

"Our business with the Vit Plant has grown," Valdez said. "We appreciate their business and value them very much. We try to give them outstanding customer service." For more information, see <https://bit.ly/3mbxLPN>.



WHAT IS A HUBZone?

The Small Business Administration classifies certain areas as Historically Underutilized Business Zones, or HUBZones.

WHAT IS THE HUBZone PROGRAM?

The HUBZone program fuels small business growth in historically under-utilized business zones by providing preferential access to federal procurement opportunities, with a goal of awarding at least three percent of federal contract dollars to HUBZone-certified companies each year.



IONEX Provides High-Tech Filtration System for Vit Plant

Lafayette
COLORADO

Location: Lafayette, Colorado

WHAT IS NQA-1?

Nuclear Quality Assurance (NQA-1) standards are the nationally recognized quality standards for equipment for nuclear facilities.

HOW IMPORTANT IS QUALITY AT THE VIT PLANT?

Bechtel and principal subcontractor Amentum have built solid reputations that are rooted in their longstanding commitments to getting the job done right.

The Vit Plant's quality management system is robust and provides defense-in-depth to help us do our work right the first time, every time.

We understand that our work contributes directly to the Vit Plant's ability to operate safely, and we take that responsibility very seriously.



For more on our commitment to quality, see <https://bit.ly/3q3k2vs>.



IONEX Research Corporation may be a small business, but it provided big solutions in the design and manufacture of a complex filtration system for the Vit Plant that will help protect people and the environment.

Based in Lafayette, Colorado, IONEX designed, engineered and manufactured a thermal catalytic oxidizer (TCO) skid for the Vit Plant. Similar to a catalytic converter on a car, the TCO eliminates pollutants from exhaust to ensure it meets state regulations before being released into the atmosphere.

Founded in 1978, IONEX Research Corporation specializes in the design and manufacture of high-performance filtration and treatment equipment used in the processing of chemical and nuclear waste. The company has 76 employees and a 44,000-square-foot manufacturing facility in Lafayette.

IONEX has worked with the Vit Plant since 2002, supplying critical items such as gloveboxes, fume hoods, and a transfer cart and tunnel that carries waste into the radiation zones in the facility.

The \$13 million TCO skid took two years to design and build and was constructed to rigorous Nuclear Quality Assurance (NQA-1) standards, the requirement for equipment used in nuclear facilities. The skid is located in the Low-Activity Waste Facility, where vitrification occurs. It performs a critical step in treating exhaust that comes from the melters.

"We have highly skilled welders, who, along with our welding program, are qualified to the American Society of Mechanical Engineers standards," Angie Carrasco, senior project manager at IONEX Research Corporation, said. "It was very complex equipment involving extensive commercial grade dedication and complex factory acceptance testing within our NQA-1 program."

Commercial grade dedication (CGD) is a process where a commercial grade item is qualified through verification of its critical characteristics for dedicated nuclear use.

"IONEX Research Corporation has been a valuable partner as we move from construction to commissioning and startup," said Rick Holmes, general manager of the Waste Treatment Completion Company, the subcontractor that oversees the physical work at the Vit Plant. "Their technical and scientific expertise has contributed critical equipment to the Vit Plant." For more information, see <https://bit.ly/3s9KPJf>.



Community Corner: Supporting Toys for Tots and Bikes for Tikes

The Hanford Vit Plant donated \$8,000 of cash and toys to the U.S. Marine Corps Reserves' Toys for Tots campaign at a drop-off donation event in Kennewick on Dec. 11. The donation included \$8,000 in corporate donations from Vit Plant prime contractor Bechtel National, Inc. and subcontractor Amentum.

Vit Plant employees also dropped off toys, made online donations, and purchased hundreds of toys from an Amazon wishlist that were delivered directly to the Toys for Tots organization.



Glen Carter, local Toys for Tots coordinator, accepted the donations at the drop-off event.

"We have partnered with the Vit Plant for more than a decade now, and they are always instrumental in helping us meet our goals," said Carter. "We've seen community needs rise steadily over the past few years, and we are so grateful for continued generosity of the Vit Plant employees, Bechtel, and Amentum."



An additional \$5,000 was donated by Bechtel to the Local 598 Bikes for Tikes campaign, which also supports Toys for Tots.

Donations to Bikes for Tikes helped purchase and assemble 2,000 bikes for the community, including 350 that are designated for Toys for Tots.

In 2021, the Vit Plant team donated more than \$425,000 to over 30 local organizations, campaigns, and programs, such as United Way of Benton-Franklin Counties, Second Harvest, Columbia Industries and Junior Achievement.

SPOTLIGHT ON: COLUMBIA INDUSTRIES EMPLOYMENT SERVICES PROGRAM

Bechtel recently donated \$5,000 to Columbia Industries Employment Services program.

Columbia Industries is a local nonprofit whose mission is to support and empower individuals with disabilities and other challenges. The Employment Services program assists people with disabilities or other barriers with finding meaningful employment, and offers services such as skills training, resume building, one-on-one coaching, and assistance with job placement. The program also works with local high school students to set them up with job shadows, trial work experiences, and work-based learning.



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 millions of 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.



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