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‘Bubblers’ Provide Decade of Improved DWPF Operations, Preparation for Salt Waste Processing Facility

AIKEN, S.C. (October 8, 2020) – Innovative equipment known as “bubblers” have been improving liquid waste operations at the U.S. Department of Energy’s (DOE) Office of Environmental Management’s (EM) Savannah River Site (SRS) for the last decade and will aid in the future operations of the Salt Waste Processing Facility (SWPF) — an EM 2020 priority.

Bubblers are used in the melter, the key equipment at the center of the Defense Waste Processing Facility (DWPF), the site’s vitrification plant operated by EM and SRS liquid waste contractor Savannah River Remediation (SRR). The bubblers improve the heating and melting steps of the vitrification process.

A mixture of high-level sludge waste, glass frit, and water is sent to the melter and heated to 2,100 degrees Fahrenheit in a continuous feeding and pouring operation. The molten-waste mixture is poured into stainless-steel canisters where it hardens, creating a glass waste form — the end product of vitrification.

In September 2010, EM and SRR retrofitted the DWPF melter to accommodate the installation of four melter agitation bubblers. The bubblers were installed to achieve faster waste processing throughout the SRS liquid waste facilities, a significant preparation for SWPF, EM’s facility to process the majority of the remaining radioactive liquid waste at SRS.

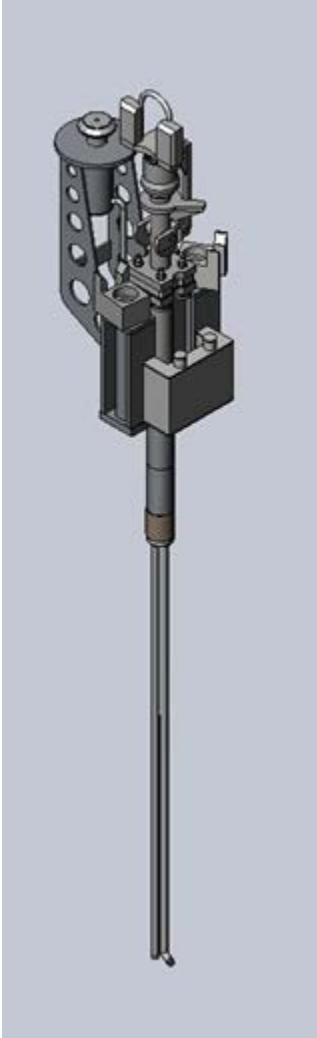
SRR subcontractor Atkins developed, designed, and fabricated the melter bubbler technology.

The bubblers agitate the molten glass pool by deploying bubbles near the bottom of the melter using argon gas. The rising bubbles effectively agitate the melt pool. This agitation creates more convection and mixing within the melt pool, increasing the heat transfer to the melt pool cold cap. The cold cap is the layer of unmelted feed floating on top of the melt pool, similar to ice floating on top of water. This rise in heat transfer increases melter throughput, allowing it to pour more canisters of vitrified waste more frequently.

(more)

SRR Chief Operating Officer and Deputy Project Manager Mark Schmitz said the bubbler technology has proven to be a positive development for efficient melter operation at DWPF.

“The liquid waste facilities work as an integrated system, and this system will soon include a new major player, the Salt Waste Processing Facility,” Schmitz said. “When one facility is operating efficiently, such as the Defense Waste Processing Facility, the whole system runs well. This reliable integration will be key in ensuring efficient Salt Waste Processing Facility operations.”



Cutline: Innovative equipment known as bubblers are used to improve the vitrification process at the Savannah River Site's Defense Waste Processing Facility

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