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SRS Liquid Waste Contractor Improving Salt Processing Efficiency

AIKEN, S.C. (May 4, 2023) – The liquid waste contractor at the Department of Energy Office of Environmental Management's Savannah River Site is implementing several changes for improving the efficiency and resiliency of equipment inside the Salt Waste Processing Facility (SWPF), which will allow the facility to process more salt waste.

The SWPF has become a workhorse of the liquid waste program, setting records for the volume of liquid waste passing through its systems in its first two years of operation, according to Jim Folk, DOE-Savannah River assistant manager for waste disposition.

“Minimizing shutdowns for cleaning will result in increased processing time and, therefore, higher overall production for this facility,” Folk said. “With these methods proving effective, the overall efficiency of the program increases and helps us safely process more waste each year.”

The issue at hand is that some undissolved material in the waste stream is causing more facility downtime to clean a piece of equipment inside SWPF called the strip effluent coalescer (SEC).

Savannah River Mission Completion operates SWPF and is determining the most effective means for cleaning the SEC. During the solvent recovery function, the SEC gathers small droplets of solvent and grows them into larger droplets so they can be easily removed from the system. However, other unwanted particles in the waste can also collect on the surface of the SEC.

Laboratory samples taken from the surface of the SEC show undissolved material composed of mercury and titanium, with small amounts of iron and aluminum. Mercury comes from the waste being processed, while the titanium comes from the monosodium titanate (MST), a chemical additive to the processing system. The higher the production level inside SWPF, the more particulates that are introduced into the system, reducing the equipment’s efficiency.

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Page 2 - SRS Liquid Waste Contractor Improving Salt Processing Efficiency

As those particulates accumulate, operations at the facility must be temporarily shut down to flush the materials out of the system. The downtime resulted in approximately 50 days of lost system availability and processing time in the past year.

Steve Howell, SWPF director, said he and his team are examining both mitigation and prevention solutions, with the expectation of reducing this downtime.

“Several mitigation methods have been considered,” Howell said. “We have created a tie-in point directly upstream from the SEC that will enable us to locally flush that component without having to shut down the entire system.”

Howell said that the initial run of the flushing modifications demonstrated positive results. During March, following completion of those modifications, SWPF experienced a 300% improvement in operational time, enabling the facility to establish a new record for weekly and monthly processing volumes.

Among other prevention actions being implemented is the 75% reduction of the volume of MST used in processing while still satisfying the waste acceptance criteria. MST is added to help remove radioactive isotopes known as strontium and actinides from the waste. A reduction in the amount of MST being used will reduce the potential amount of titanium that could build up on the SEC, requiring a shutdown.

The combined strategies could cut the amount of necessary downtime by two-thirds, resulting in the addition of nearly 34 days of processing time each year. The improvements also could reduce the number of times workers must perform more thorough routine cleanings.

Cutline: The DOE Office of Environmental Management is making changes inside the Savannah River Site’s Salt Waste Processing Facility that are expected to enable the facility to process greater volumes of salt waste.