

SRS Salt Waste Processing Mission

ABSTRACT

The SRS Liquid Waste Contract is managed by Savannah River Remediation LLC (SRR) a team of companies led by URS Corp. with partners Bechtel National, CH2M Hill and Babcock & Wilcox. The SRR mission at SRS is to operationally close high level waste storage tanks. Ninety-seven percent of the waste stored at SRS consists of Salt Supernate and Salt Cake. SRR currently processes approximately one million gallons of salt waste per year. The DOE is currently constructing the Salt Waste Processing Facility (SWPF) to increase the total salt waste processing capability at SRS to 7.4 million gallons per year. It is estimated that before salt waste processing is completed at SRS, eighty-nine 1 million gallon batches of salt waste will be sent to SWPF for processing. Prior to a salt waste batch being sent to SWPF waste compliance sampling must occur to ensure waste acceptance criteria (WAC) is achieved, satisfying stakeholder requirements. Three hundred fifty waste compliance samples with analysis of 150 constituents for each sample will be required for the salt waste processing campaign.



Present Waste Sampling Method

- Sample vial contact rates as high as 10 rem/hr. with whole body dose rates up to 6 rem/hr have been experienced
- In summer months operator exposure to potential heat related health hazards increases
- Requires personal protective equipment (PPE)
- Glove bag positioned over tank top riser port opening
- Lower sample vial through the waste tank top port opening using a rod handle and fishing reel then submersing the vial in the waste until a sample has been collected
- Operators position themselves with arms out stretched to minimize whole body exposure from the radiological source
- Although sample collection and sample vial preparation takes place within a glove bag, and all PPE is in place, handling of the sample vial is required, increasing the gamma dose rate exposure to the extremities



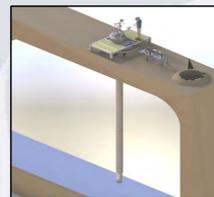
Technology Driver - Continuous Improvement



Physical Mockup of Fluidic Sampler Sampling Station will be available for evaluation in FY 2011



Waste sample collection to confirm Waste Acceptance Criteria



New Generation Waste Sampler Currently in the Design Phase



- Provide Sampler That:
- Improves Operator Ergonomics
 - Reduces Radiological Exposure through changes in time, distance or shielding
 - Reduce time exposed to ambient conditions with reductions in sample time duration



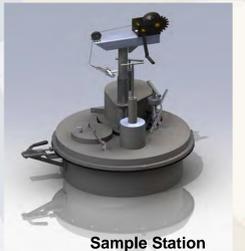
Fluidic Sampler Technology Improvement

Funded by DOE-EM20 in 2009, the Single Point Fluidic Waste Sampler is being designed by NuVision Engineering.

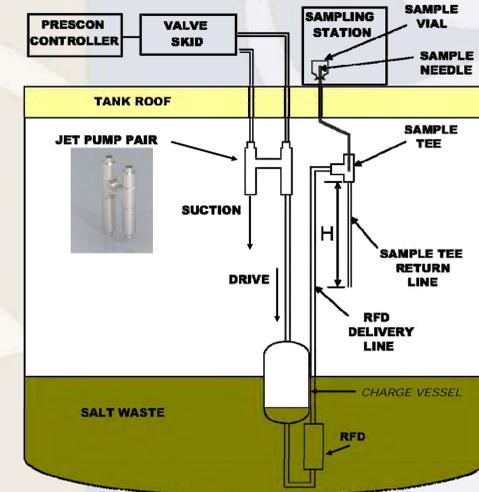
SRR is providing technical support for deployment in H-Tank Farm Tank 50

Design aligns with SRR commitment to ISM, ALARA and Waste Minimization principles by incorporating safety into design

- Radiological dose to employees is negligible. Sample Station is designed to reduce whole body exposure to <5 mr/hr
- Sample collection takes place within shielded Sample Station



Sample Station



Sampler uses pressurized air as the motive force

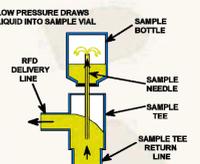
Pump is cyclical completing one full cycle per minute

Suction Phase through left side of the Jet Pump Pair creates the vacuum to bring waste from storage tank through RFD, into the Charge Vessel

The Drive Phase through right side of the Jet Pump Pair pushes waste from the Charge Vessel, past the Reverse Flow Diverter (RFD) and through the Sample Tee creating negative pressure in the Sample Needle and Vial

Waste is drawn up into the Sample Vial through the Sample Needle

A 200 ml sample is collected in 6-7 minutes



Anticipated Results

With scope unchanged, it is anticipated that significant improvement will be realized in ergonomics and the areas of radiological and ambient conditions exposures

- A reduction by a factor of 1000 in radiological exposure
- A reduction of 50% in exposure to ambient weather conditions
- Recognized improvement in ergonomics for employees

Mockup results will be shared with the complex.

Mockup will be maintained for future training of Operations, Maintenance and ESH personnel at Savannah River Site

Fluidic Waste Sampler Status

Preliminary Hazards Analysis - Complete

Review of preliminary design drawings - Complete

Sample Station Mockup Fabrication - In Progress

Mockup ready for SRR evaluation - January 2011

NVE detailed design - In Progress