



Saltstone LLW Processing Update



Aaron Staub
Senior Engineer
Waste Solidification Engineering
Denver Technical Exchange

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Saltstone Facility: Background

- Commissioned in 1990 for waste treatment of site evaporator bottoms effluents and decontaminated salt solution from In-Tank Precipitation (ITP) processing.
- Original design allowed for significant contact maintenance, waste expected to have minimal radioactive source term.
- During 1990s and early 2000s, delays in salt processing eliminated much of the feed planned for Saltstone. Intermittent operations only to support evaporator effluents.
- By mid-2000s, Tank Farm space requirements create need to dispose of small volume of waste with higher Cs-137 levels than originally forecast.
- Significant re-design of process to shorten maintenance activities, improve reliability completed in 2006.
- Facility resumes waste processing in 2007, alternative salt processing initiated to provide feed for Saltstone

Saltstone Facility- Processing Summary

- Since 1Q07:
 - Treated 2.34 Mgal of salt solution
 - Poured 18,000 yards of grout
 - Immobilized 285 kCi of radionuclides (primarily Cs-137)

Saltstone Vault 4 Inventory

E

	Cell G	Cell H	Cell I	Cell J	Cell K	Cell L	
	0.0	0.0	0.0	0.0	0.0	0.0	
	21.5 ' Grout	Empty	13.2 ' Grout	1.5 ' Grout	15.0 ' Grout	8.0 ' Grout	
N	NOT For USE		NOT For USE				S
	Cell A	Cell B	Cell C	Cell D	Cell E	Cell F	
	0.0	0.0	0.0	0.0	0.0	0.0	
	Full	Empty	15.5 ' Grout	FULL	20.4 ' Grout	1.2 ' Grout	
			NOT For USE		NOT For USE		
			W				

Challenge #1- Vault Wall Seepage

- Grout monolith to be self-supporting, design does not accommodate hydrostatic head beyond 5 ft
- Drain system retrofitted where possible to mitigate bleed water impacts
- Cells with marginal removal capacity are prone to seepage through cracks and construction joints
- Significant rework to mitigate impact of wet spots through contamination control and eliminate future seepage via surface treatment systems



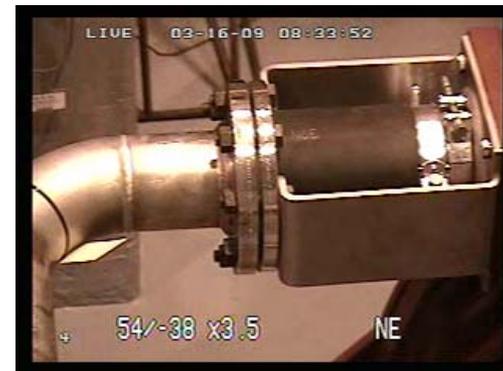
Challenge #1- Vault Wall Seepage

- Surface treatments used to minimize wet spot formation
 - Combination of Xypex and Mega Mix II coatings
- Minimize opportunity for rainwater intrusion
 - Use of guards and ventilated enclosures
- Optimize grout formulation to minimize bleed water generation
- Future disposal cells will accommodate the static head caused by bleed water



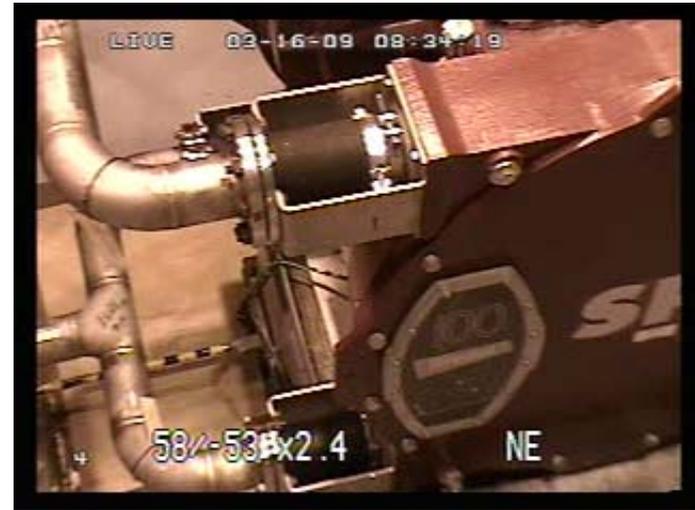
Challenge #2- Grout Pump Hose Failure

- Grout pump is duplex peristaltic pump- 10.5 gal/rev, nominal 140 gpm flow
- Chosen due to reliability, available suction head, use in industry, ability to handle abrasive slurries
- During processing, experienced a loss in pump efficiency followed by breach of hose integrity
- Subsequent diagnosis points to a suction starvation of west side hose, resulting in water hammer and hose abrasion



Challenge #2- Grout Pump Hose Failure

- Hose failure released ~15 gal of grout into pump casing and a smaller volume was widely dispersed throughout process room
- Required replacement of grout pump (~\$100k), loss of several days production, significant decontamination effort in process room



Challenge #2- Grout Pump Hose Failure

- Corrective Actions:

- Short term

- Immediate implementation of pump efficiency metric with operator alarm (DCS calculation based off of pump speed, tank level change, and measured flow)
- Response procedure developed to allow for orderly shutdown

- Long term

- Temperature measurement of pump head (RTD, IR camera, etc.)
- CFD modeling of suction piping, rework if improvements indicated

Challenge #3- Improve Reliability/Maintainability

- Original salt processing flowsheet had significant surge capacity (+1Mgal) between salt processing facilities and salt disposal facilities.
- Tankage needed to support HLW process demands, no longer available to support Saltstone production
- Close coupling of facilities (~120kgal surge) demands higher attainment/less downtime to meet production goals

Challenge #3- Improve Reliability/Maintainability

- Update obsolete equipment
 - Nol-tec upgrades for dry feeds batching
 - Use of DCS instead of PLCs for control
- Implement and manage critical spare inventory database for long-lead items
- Implement PdM where practical
 - Fans, motors, etc. in clean areas
 - May also include remote monitoring of process room equipment

Summary

- Significant production since restart in 2007, 35% of total treatment volume has occurred in this period
- There have been discrete failures that have caused downtime
- Bleed water management has been primary facility obstacle, future vault designs should accommodate
- Facility is attempting to prepare for changing environment that will occur when Salt Waste Processing Facility begins operation

Questions?

- Aaron V. Staub
704-Z
Savannah River Site
Aiken, SC 29808

(803) 208-6906

aaron.staub@srs.gov