Savannah River Site Nuclear Laboratory (SRNL) Technology Insertion

Phillip "Tony" Polk
Director, Savannah River Laboratory Office

Briefing for National Academy of Science Review
February 9, 2021

Technology Insertion: Next Generation Solvent – an unparalleled success

SRS SWPF

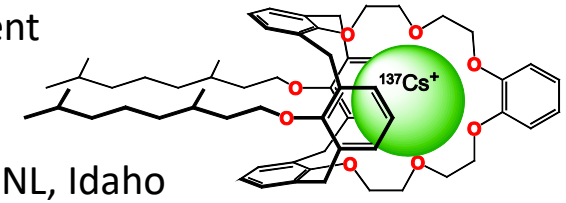
-Capital Cost: $2.3B
-Original Design Throughput ~ 7M gal/yr
-Throughput with Next Gen Solvent 9+M gal/yr
-Planned for SWPF insertion in 2023

SRS Interim Salt Processing Facility-ARP/MCU

- Capital Cost: $100M
- Cumulative Salt Solution Processed: 3.56 Mgal
- Throughput with Next Gen Solvent validated at ~9+M gal/yr SWPF equivalent

Science, Technology & Innovation:

- Next Generation Solvent
- Centrifugal Contactor



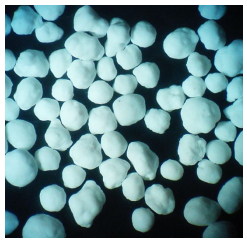
Integrated effort:

ORNL, SRNL, Argonne, PNNL, Idaho

Technology Insertion: Tank Closure Cesium Removal (TCCR)

Process Enclosure

Ion Exchange Columns



Crystalline silicotitanate

sintered metal dead-end filter assembly

TCCR Project

$34 M for TCCR	~500 kgal/y
(operational; 30 months to reach deployment)	
$17M for upgrades (TCCR-1A) in progress	
TCCR-2	~1 Mgal /y
Start of Demonstration	16 Jan 2019
Volume processed	300 kgal (complete)

Supplemental to SWPF Processing (Target: 5 Mgal) independent of DWPF

Parallel program at Hanford (TSCR).

Science, Technology & Innovation:

- Ion exchange media development
- Media preparation
- Gamma monitor in-line measurements
- Performance and thermal modeling platforms
- Feed qualification and process verification samples
- Capacity/loading testing
- Integration into System / Downstream Impacts
- Safety Basis fundamentals
- Maturation of technology over >20 years

Enhanced Attenuation of VOCs --

Edible Oil Deployment

SRS T-Area (2008) -- Transition strategy for transition from active Pump and Treat to Passive Treatment with Edible Oil designed and implemented

- **Regulatory approval of remedy led to site closure**

Strategy transferred to DOE Legacy Site, Mound, Ohio (2014)

- **Estimated duration for Pump and Treat to closure was 21 years**
- **SRNL provided site-specific design information and consulting for strategy implementation**
- **After implementation, SRNL provided annual data review and performance analysis**
- **Regulatory approval for transition to passive remedy granted in 2020**