CONTINUOUSLY IMPROVING THE LIQUID WASTE MISSION

November 14, 2017

Rodney Blackmon
Project System & Execution Strategy Director
Lean Business System

STRATEGIC PLAN AND TRUE NORTH METRICS:
- Establish Vision and mission for organization
- Basis for hardwiring visual management

WORKPLACE LEAN ACTIVITIES:
- Visual Management
- Standard Work
- Problem Solving Tools

FACILITATED LEAN EVENTS:
- Value Stream Analysis (VSA)
- Rapid Improvement Event (RIE)
- Projects, JDIs, etc.

Continuous improvement is a core value
### DWPF Bubblers

Bubblers more than double canister production capability

### Canister Double Stack

- Doubles existing storage capacity (from 2,262 to 4,524)
- Successfully stacked 202 radioactive canisters in GWSB1
- Creates safe interim storage through Fiscal Year 2029
- Postpones expense of another storage facility, saving $74 million
Tank Closure

Current State of Tank Closure Before Lean

- Average Duration: 8-10 years
- Average cost/tank: $50 million

Attributes

- Stay the course – eliminate starts and stops across the project
- Standard work and designs
- Simplified regulatory deliverables
- Increased parallel work rather than sequential
- Design with the end in mind – applied to Roteks (part of low-volume mixing jets) to reduce transition from Bulk Waste Removal to Heel removal
- Expedite characterization to eliminate need to wait for tank grouting

Target State of Tank Closure After Lean

- Average Duration: 4-6 years
- Average cost/tank: <$40 million

- Heel Removal
- Cooling Coil Flushing
- Annulus Cleaning
- Final Sampling

Event Benefits

Engineering Documents Rapid Improvement Event

- 58 day (50%) reduction in average cycle time from design input to output
- 50% reduction in the average number of drawings requiring change

Contaminated Pump Removal Rapid Improvement Event

- Establish storage control for necessary equipment—reduces ~900 person-hours from critical path
- Grout pumps in-place—saves ~$1M per tank

It’s All in Our Own Hands—Insights to Lean Events

“Value is something you’re willing to pay for. At SRR, we’re eliminating unnecessary processes that the client doesn’t want to pay for.”
- Tom Foster, SRR President and Project Manager

“There is a common misconception that since this is the way ‘we have always done it,’ our stakeholders will not consider accepting anything different. The strength of the Lean process is that key stakeholders are invited to participate in the events. The assembly of affected parties is extremely powerful for team building and educating each other about what drives each organization’s decision making.”
- Lean participant
Saltstone Disposal Units

SDU 9
SDU 10
SDU 11
SDU 12
SDU 6
SDU 7
SDU 8
~$1.9 Billion Cumulative Life-Cycle Cost Efficiencies Identified

Salt batch qualification cycle time
66% reduction...
...which equates to...
24 months...
...which equates to...
$1.0 billion in life-cycle savings

Error Proofing Complex Processes
32% reduction in pages
45% reduction in steps
48% reduction in sign-offs

SDU 6 Complete
Delivered 16 months ahead of schedule
$25 million under budget

25% reduction in planning cycle-time at SRR
50% reduction in design drawings and cycle time for engineering documents for tank closure

30% reduction in resources needed to operate the Effluent Treatment Facility...
...which equates to...
$1/2 million per year

132 Events
16 Value Streams
38% workforce participation
68 instances of regulator, stakeholder, and customer involvement in events

48% schedule improvement and 25% improvement in cost efficiencies for tank closure
Reduce Salt Batch Validation Time

Current Process for Collecting, Analyzing, and Reporting Samples for Salt Batch Processing
Verification Takes too long To Support SWPF Operations

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>~100 analytes</td>
<td>~25 analytes</td>
</tr>
<tr>
<td>4-5 months qualification time</td>
<td>~1 month acceptance time</td>
</tr>
<tr>
<td>2-3 months analysis time</td>
<td>2 weeks analysis time</td>
</tr>
<tr>
<td>1-2 months report</td>
<td>1 week report</td>
</tr>
<tr>
<td>Increased reliance on process history</td>
<td></td>
</tr>
</tbody>
</table>

This table compares the current and proposed processes for collecting, analyzing, and reporting samples for salt batch processing. The proposed process aims to reduce the time and effort required for verification, thereby supporting SWPF operations more efficiently.
We do the right thing.

4,000th canister poured 12/31/15

400 Interim canister storage positions modified; Began double-stacking canisters

60% reduction in decontaminated salt solution disposal costs

2.6 million gallons of tank space gain (36 million gallon inventory) in FY15

100% complete on 32.8 million gallon capacity Saltstone Disposal Unit

99.9975% radionuclide removal with Next Generation Solvent

0.6 million gallons of tank space gain (36 million gallon inventory) in FY15

60% reduction in decontaminated salt solution disposal costs

99.9975% radionuclide removal with Next Generation Solvent