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DELIVERING VALUE THROUGH PROGRAM INNOVATIONS AND LEAN

PRESENTATION TO CITIZENS ADVISORY BOARD

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Value for our customer:

- **Customer**: an individual or group that benefits from the product or service provided.
- **Value**: a specific deliverable that fulfills a CUSTOMER expectation or need (what you are willing to pay for).

Methods:
- Daily technical Innovations
- Continuous Improvement Initiatives, such as Lean Business System, Six Sigma
Lean Business System

**FACILITATED LEAN EVENTS:**
- Value Stream Analysis
- Rapid Improvement Event
- Projects, Just Do Its, etc.

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

**STRATEGIC PLAN AND TRUE NORTH METRICS:**
- Establishes vision and mission for organization
- Basis for hardwiring visual management

Continuous improvement is a core value similar to safety
Need to Deliver Value
...what customers want
...while maintaining aging infrastructure
...with the same set of resources
SRR Liquid Waste Program: Delivering Value

43 tanks, 35 Mgal, 264 MCi

Salt waste

ARP

MCU

SwPF

TCCR (proposed)

Spent Columns (TBD)

Tanks Closed

Nuclear Material Disposition/Legacy Liquid Waste

<1% radionuclides remain in tanks

Salt waste

Sludge waste

DWPF

Inert chemicals

Radionuclides

ARP – Actinide Removal Process
MCU – Modular Caustic Unit
SWPF – Salt Waste Processing Facility
HLW – High Level Waste
LLW – Low Level waste

Interim Storage for Canisters

Glass Waste Storage

Most radionuclides to glass

Saltstone Production Facility

Disposal Capacity

Saltstone Disposal Units

Saltstone<br>& other<br>lithics

Disposal<br>Capacity

<<1% radionuclides to Saltstone

<1% radionuclides remain in tanks

HLW Vitrified

Most radionuclides to glass

LLW Stabilized

Saltstone Disposal Units

<<1% radionuclides to Saltstone

Saltstone production facility

Disposal Capacity

Saltstone Disposal Units

<<1% radionuclides to Saltstone
Benefits Come in All Shapes

**Salt batch qualification cycle time**  
66% reduction  
...which equates to...  
8.5 months  
...which equates to...  
$1.0B in life-cycle savings

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

**Salt Waste Processing Facility Tie-In Schedule**  
$55M life-cycle savings  
4-month reduction

**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 Effluent Treatment Plant**  
...which equates to...  
$½M per year

**48% schedule improvement and 25% improvement in cost efficiencies for tank closure**

102 Events  
15 Value Streams  
30 percent workforce participation  
>30 instances of regulator, stakeholder, and customer involvement in events
Delivering Value through Lean: Tank Closure

**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 – meaning design not just for waste retrieval but also consider what is necessary for characterization and grouting the tanks
- Expedite characterization to eliminate need to wait for tank grouting

**Current State of Tank Closure**

- Bulk Waste Removal
- Heel Removal
- Cooling Coil Flushing
- Annulus Cleaning
- Isolation & Final Sampling
- Grout Tank

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

**Target State of Tank Closure After Lean**

- Waste Removal
- Isolation
- Grout Tank

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

**Benefit**
- Engineering Documents RIE: 58 day (50%) reduction in average design cycle time  
- 50% reduction in the average number of drawing change
- Contaminated Pump Removal RIE: ~900 person-hours reduction from critical path associated with storage control  
- Save $1M per tank by grouting pumps in-place
- Tank Characterization RIE: Implement Project Management with the end in mind—removes three years from tank closure critical path and saves ~$1.2M per tank  
- Reduce critical path schedule by six months or $600k per tank.
- Grouting of In-Tank Equipment (including cooling coils) RIE: Eliminate coil flushing—saves >$65K per tank and generation of 5,000 gallons of liquid waste that historically goes back to an active waste tank for treatment  
- Eliminate grey water totes (20 per tank)—saves ~$100K per tank  
- Standardize header removal—saves >2,000 person-hours per tank
- Just Stop Its/Just Do Its: “Just Stop” ventilation removal  
- “Just Stop” pump removal when it does not make economic sense  
- Engineering develops and approves configuration management template  
- For each tank, define and obtain early DOE buy in to complete entire scope—waste removal through tank closure
- Develop standard work package
- Develop standard design for closure tanks

**Insights to Lean Events**

- "Our own paradigms drive our behaviors: almost 100% of the time we discovered that we were over interpreting the rules or requirements."
- "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."
- "There is always more than one way to tackle a problem and our stakeholders are open to alternate solutions that have sound technical basis. In one instance, we were able to resolve a technical challenge during the course of an event that saved six months from our closure schedule – it was win-win for all parties!"
Delivering Value through Lean: Improved Production

- Elimination of non-value added actions in work planning & control processes
- Re-engaging the workforce by doing meaningful work…and fostering a positive attitude
- Introduction of Standard Work to work planning & control processes
- Introduction of a visual management tool
- Savings has been translated to corrective maintenance backlog reduction

- 30% decrease in maintenance schedule add-ons
- 52% decrease in rescheduled maintenance work orders
- 25% reduction in planning cycle time at SRR
- 37% – 51% increase in Tank Farm Maintenance FIN to New Work Ratio
Delivering Value through Innovations: HLW Vitrification and Interim Storage

**DWPF Bubblers**

Bubblers more than double canister production capability

**Canister Double Stack**

- Doubles existing storage capacity (from 2,254 to 4,508)
- Successfully stacked the first two radioactive canisters in August
- Creates safe interim storage through Fiscal Year 2029
- Postpones expense of another storage facility, saving $74 million
Delivering Value through Innovations: Saltstone Disposal Units
Delivering Value through Lean: Making the Workplace Safer

5S
Connecting the dots between LEAN and a safer work place

Promote employee engagement by providing tools to identify and address issues

Safety is at the core of the SRR Business Management System
Lean events focused on simplification of high hazard, complex processes

Evaluated
- Sequencing and flow of procedure
- Key Requirements
- Clarity of instruction
- Elimination of unnecessary steps and sign offs

### DWPF Procedure Current State Analysis

<table>
<thead>
<tr>
<th>Solution</th>
<th>Experiment</th>
<th>Expected Result</th>
<th>Actual Result / Benefit</th>
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</table>
| Use the A3 problem solving approach with a cross functional team to validate to requirements, update and test the procedure | Test Procedure | Ease of use | ✓ 32% Reduction of pages  
✓ 45% Reduction of number of steps  
✓ 48% Reduction of number of sign offs |
Delivering Value: Liquid Waste Program

ARP/MCU = Actinide Removal Process and Modular Caustic Side Solvent Extraction Unit