Liquid Waste Programmatic Risk Reduction-Spare Equipment and Spare Parts

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Recommendation: The Savannah River Site Citizens Advisory Board recommends that DOE:

1) Describe how projected life expectations are determined and then utilized in the development of a list of spare equipment and spare parts.

2) Describe how the spare equipment and/or spare parts program is or is not consistent with shorter life history scenarios.

3) Identify areas of significant risk reduction and explain how these risk reductions relate to the spare equipment and spare parts budget.

4) For existing operations, identify areas where equipment life histories are being “pushed” because of operating rates or more extreme operating conditions. (For example: Defense Waste Processing Facility (DWPF) melter and off-gas system, Saltstone production equipment and sludge batch preparation equipment.)
1) Describe how projected life expectations are determined and then utilized in the development of a list of spare equipment and spare parts.
• The System Performance Monitoring Program is used to determine if SSCs are capable of being maintained for the current mission and beyond.
The following list represents typical items that may be used as sources of SSC information in support of performance monitoring:

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<th>Maintenance</th>
<th>Operations</th>
<th>Engineering</th>
<th>Other</th>
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<tr>
<td>Corrective Maintenance Results</td>
<td>Area Data Instructions</td>
<td>AIM/SPF</td>
<td>Erosion/Corrosion</td>
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<td>Equipment Maintenance Management System (EMMS)</td>
<td>Chemical Analyses (e.g., water, lubricants) Surveys</td>
<td>Codes and Standards</td>
<td>Radiochemical Analyses</td>
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<td>Maintenance History (PassPort) and Trending Reports</td>
<td>Computer History Data</td>
<td>Engineering Judgment</td>
<td>SRTC Fault Tree Data Banks</td>
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<td>Maintenance History Logs (1Y, 18.01)</td>
<td>In-service Inspection Results</td>
<td>Leakage Monitoring Results</td>
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<td>MOVATS Testing</td>
<td>In-service Test Results</td>
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<td>Post Maintenance Test Results</td>
<td>Instrument Calibration check sheets</td>
<td>Vendor manuals and bulletins</td>
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<td>Predictive Maintenance Results</td>
<td>Operator Round Sheet red circled readings</td>
<td>Safety Basis documents (DSA, TSRs, Linking Documents, etc.)</td>
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<tr>
<td>Preventive Maintenance Results</td>
<td>Performance Tests</td>
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<td>Program Reporting Tool (PRT)</td>
<td>Plant Monitoring Computers</td>
<td>Distributed Control System (DCS)</td>
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<tr>
<td>Vibration Monitoring Results</td>
<td>Plant operating experience</td>
<td>Structural integrity Program (EY, 3.48)</td>
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- Life Expectations are determined based on Maintenance, Operations, Engineering and other information sources
• System Performance Monitoring program assures that SSCs are capable of being maintained for the current mission and beyond.
• System Performance Monitoring assessments are issued quarterly with a more detailed report issued annually.
• Assessments document evaluation of SSCs including service life, obsolescence, material condition, equipment degradation, maintenance history, performance trends, spare parts adequacy and recommended improvements
• Assessments are reviewed with Facility Management enabling priorities to be set and resources to be assigned
### Spare Parts

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<td>Are SSCs capable of being maintained for the duration of the current mission and beyond? At a minimum, evaluate available spares for major components, and any associated engineering recommendations. Recommendations should be based on TSR impact, shelf life, availability, failure rate, cost, and other criteria supported by the System Viability process and/or deemed important by the System Engineer. Spares requiring PM - Have you, or the prior CTF, established PM requirements for spares? - Is Custodian Funded to perform PM? Are there adequate spares for critical and/or single point failure equipment? Are Minimum / Maximum Order Levels adequate? Is Procurement Processing time / expediting adequate? Are there sufficient reserve of consumables - filters, gaskets, lubricants, bulbs, windows, chemicals? Are there NCR Dispositions pending release of spares? Items unused within 18 months are listed &quot;Do Not Order&quot;. Are there multiple suppliers? List critical spares and their suppliers. Note: This is a “Life Extension” field. In the SHIR software, the Life Extension report template will generate a report which includes all Life Extension fields.</td>
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- System Performance Monitoring includes verification that spares support operations
The purpose of the Spare Parts program is to:
1) have parts when needed; 2) while minimizing the stock on hand; 3) providing the users with accurate descriptions; 4) making the part available to as many users as possible.

Required spares based on usage rate and time to procure.

Spares can be maintained on a Min/Max or Order on Demand stocking system.

Program includes annual review of usage and update to forecasts based on changes to equipment and programs.
2) Describe how the spare equipment and/or spare parts program is or is not consistent with shorter life history scenarios.
### Potential for Change

Are SSCs capable of being maintained for the duration of the current mission and beyond? Consider the following which could affect the SSC availability requirements:

- Future Mission Change
- Change in System Performance Requirements
- Change in System Functional Requirements
- Impact of failure of critical equipment / subsystem / software

**Note:** This is a “Life Extension” field. In the SHR software, the Life Extension report template will generate a report which includes all Life Extension fields. Modify this field as applicable to the Component Health Report (CHR) Process.

- System Performance Monitoring program evaluate changes to mission and equipment requirements
- Changes to mission and equipment requirements are fed back into spare parts program
3) Identify areas of significant risk reduction and explain how these risk reductions relate to the spare equipment and spare parts budget.
Risk Reduction

• Most significant risk (hazard) reduction is emptying tanks sooner
  - Accelerated sludge and salt processing enable waste to be stabilized and all tanks to be emptied in 2024

• Contract Performance Baseline (includes accelerated sludge processing) and Proposals for Supplemental Salt Initiative (accelerated salt processing) include budget for spare parts in facility operating budgets
  - Spare melters are separate budget items

• Facility operating budgets are ranked at top of Integrated Project List
4) For existing operations, identify areas where equipment life histories are being “pushed” because of operating rates or more extreme operating conditions. (For example: Defense Waste Processing Facility (DWPF) melter and off-gas system, Saltstone production equipment and sludge batch preparation equipment.)
Tank Farm Equipment

- Transfer lines support salt and sludge feed
  - Passive components
  - Technical evaluations determined life expectancy based on corrosion and erosion
  - Risk of corrosion decreased by accelerated processing (life expectancy >100 years)
  - Risk of erosion not affected by accelerated processing (type of waste, flow rate and total volume of waste to be processed not changed)
• Pumps - Transfer and Mixing
  - Life expectancy directly related to operating time and pump design
    • Operating hours determined based on actual operations to date and forecast operations based on System Plan
  - Accelerated processing increases the operating time per year
  - Existing spares are available
  - Spares are in place for current operations with plans are in place to procure additional spares this year
• Installation of melter bubblers increases nominal canister production from 200 cans/year to 325 cans/year
• Additional modification will increase production to 400 cans/year
• The DWPF designed for a melt rate of 228 lbs/hour which equates to 400 cans/year
• Spare Parts support facility mission
  - Melter Spares
    • Melter 2 installed
    • Melter 3 on-site, task ready for installation
    • Melter 4 fabrication on-going, ready for installation in 2013
  - Canyon Tanks & Agitators
    • 25 pumps installed (11 different types), 18 spares on-site
    • 9 agitators installed (3 different types), 6 spares on-site
  - Canister Decontamination, Welder, Shielded Canister Transport
    • System Performance Monitoring determined spare parts support facility mission
• Current salt waste processing requires Saltstone to operate 1 day/week
  - Spare parts support facility mission
• Future operation with SCIX and SWPF will significantly increase demand
  - Enhanced Low Activity Waste Disposal (ELAWD) provides improved reliability
  - ELAWD provides replacement screw feeder and mixer, spare screw feeder, spare mixer and 2 spare grout pumps