Savannah River Remediation

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Liquid Waste Programmatic Risk Reduction-Spare Equipment and Spare Parts




April 26, 2011

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EM Environmental Management
safety • performance • cleanup • closure

Recommendation 274

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.)

Recommendation 274

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

Determining Life Expectations

- The System Performance Monitoring Program is used to determine if SSCs are capable of being maintained for the current mission and beyond.

Conduct of Engineering and Technical Support Procedure Manual	Manual:	E7
	Procedure:	3.04
	Revision:	6
SSC Performance Monitoring	Effective Date:	8/19/10
	Type-Classification:	Admin-Info
	Page:	1 of 28

Manual E7, 3.04, Rev. 6 has been completely rewritten. Revision bars are not used.

1.0 PURPOSE

This procedure provides the responsibilities and direction for the identification, testing, collection, and analysis of performance data for Structures, Systems and Components (SSC) in order to improve their reliability and availability through early detection of degradation. Early detection of SSC degradation results in better planning and scheduling of maintenance work, which further results in a significant improvement in predictive and preventive maintenance, better use of manpower, improved reliability of SSCs, and an improved spare parts program.

SSC Assessment Elements
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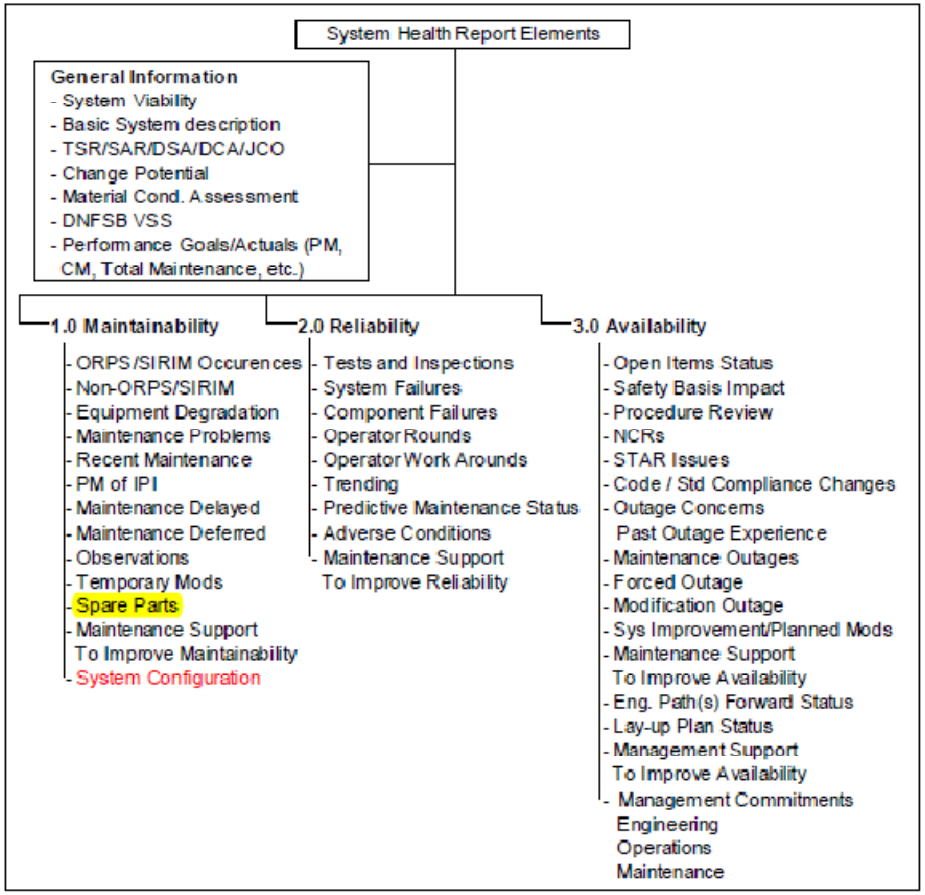

Sources used for Determining Life Expectations

The following list represents typical items that may be used as sources of SSC information in support of performance monitoring.

Maintenance	Operations	Engineering	Other
Corrective Maintenance Results	Area Data Instructions	AIM/SPF	Erosion/Corrosion
Equipment Maintenance Management System (EMMS)	Chemical Analyses (e.g., water, lubricants) Surveys	Codes and Standards	Radiochemical Analyses
Maintenance History (PassPort) and Trending Reports	Computer History Data	Engineering Judgment	SRTC Fault Tree Data Banks
Maintenance History Logs (1Y, 16.01)	In-service Inspecton Results	Leakage Monitoring Results	Process Release Monitoring Equip
MOVATS Testing	In-service Test Results	System Descriptions	
Post Maintenance Test Results Predictive Maintenance Results	Instrument Calibration check sheets Operator Round Sheet red circled readings	Vendor manuals and bulletins Safety Basis documents (DSA, TSRs, Linking Documents, etc.)	
Preventive Maintenance Results	Performance Tests	System Walkdowns	
Program Reporting Tool (PRT)	Plant Monitoring Computers	Distributed Control System (DCS)	
Vibration Monitoring Results	Plant operating experience	Structural Integrity Program (E7, 3.48)	
	Operator, Shift Manager, Control Room, and Recorder Logs		
	Surveillance Test Results		

- Life Expectations are determined based on Maintenance, Operations, Engineering and other information sources

Determining Life Expectations

- 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

Development of Spare Equipment and Spare Parts List

Spare Parts	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 "Do Not Order". Are there multiple suppliers? List critical spares and their suppliers. **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.

- System Performance Monitoring includes verification that spares support operations

Development of Spare Equipment and Parts List

- 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

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

Consistency 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

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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

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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)

Tank Farm Equipment

- 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

DWPF Equipment

- 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

DWPF Equipment

- 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

Saltstone Equipment

- 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