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PANEL SESSION 051: SRS Aligning Mission Needs and Aging Infrastructure Projects – Part 2 of 3

Session Co-Chairs: **Jeannette Hyatt**, *Savannah River National Laboratory*
Larry Ling, *Savannah River Remediation*

Panel Reporter: **Marissa Reigel**, *Savannah River National Laboratory*

Panelists:

- **David Bender**, *Division Director, Infrastructure and Area Completion, US DOE Savannah River Office*
- **Mike Lewczyk**, *Deputy Director, Nuclear and Criticality Safety Engineering, Savannah River Nuclear Solutions, LLC*
- **Kim Hauer**, *Manager, Project Integration, Savannah River Remediation*
- **Jeanette Hyatt**, *Senior Technical Advisor, Savannah River National Laboratory*

This report summarizes the second of three panels convened at the 2015 Waste Management Symposium to discuss the aging infrastructure challenges and site remediation progress at the Savannah River Site (SRS) in Aiken, South Carolina. The panel was composed of leaders from the Department of Energy Savannah River Field Office (DOE-SR), the SRS liquid waste contractor, and the SRS M&O contractor. Highlights of the challenges of an aging infrastructure, progress towards remediating these challenges, and planned efforts to continue the missions at SRS while addressing an aging infrastructure were discussed by each panelist.

Summary of Presentations:

David Bender began the panel discussion by addressing DOE's perspective on the infrastructure challenges at SRS. The SRS sits on 310 square miles of land, has 8 million square feet of facility space, 180 miles of electric distribution, 119 miles of paved roads, and employs 11,000 workers, which makes the SRS equivalent to a small city. SRS has 2300 DOE assets which equals 35% of the Environmental Management (EM) Complex total. The majority of the infrastructure (94%) is over 20 years old with 18% over 40 years old, which presents a significant challenge of maintaining or replacing old and obsolete buildings. According to the SRS Critical Infrastructure Integrated Priority List, Rev. 10, \$324M of recapitalization money is needed across all SRS programs. In order to prioritize these needs, DOE categorizes the type of infrastructure as either general use or mission specific, whether direct or indirect funding is available and balances those priorities with all the other needs across the site; specifically noting if there is strategic infrastructure viability or if it can be used for tactical mission accomplishment.

When SRS was built, there was a run to failure philosophy in regards to infrastructure. Now that there are long-term missions at SRS, there is a challenge to find a sustainable approach to maintenance. Current estimates show that \$300M of unconstrained funds needs to be allocated for general infrastructure maintenance. As this money becomes available, bridge and road maintenance will be addressed first followed by facilities. Bender noted that the SRS general infrastructure funding profile has been decreasing since FY11 and the costs for addressing

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infrastructure needs keep increasing. “Stop gap” maintenance has been the standard on facilities 60 years old or older but there will come a time when that will no longer work.

DOE and the contractors at SRS manage infrastructure needs by keeping detailed system health records in the Condition Assessment Information System and the Facility Information Management System (FIMS). These systems show ten year site plans and cross-cut integrated facilities and infrastructure. There is also a Critical Infrastructure Integrated Priority List (CIIP) that shows unfunded projects priorities, integrates program and general priorities and has been increasingly used to make funding decisions for the current fiscal year. At SRS the enduring NNSA mission and the extending EM Missions demand that a change be made to the general infrastructure paradigm at SRS. Through partnership and teamwork among SRS tenants and contractors and DOE headquarters, a strategic and consistent approach to infrastructure can be achieved. This strategy, which is consistent with the lab operations board’s look at infrastructure needs across EM, will look at right-sizing approaches, D&D, mission alignment, investments for recapitalization, and innovative solutions such as third party financing.

Michael Lewczyk discussed the aging infrastructure at SRS from the facility management perspective of Savannah River Nuclear Solutions (SRNS), the M&O contractor at SRS. As the M&O contractor, SRNS is responsible for maintaining the general site while operating the majority of the facilities onsite including H-canyon, HB-line, Tritium Facilities, L-Area, K-Area, F/H Laboratory and Savannah River National Laboratory (SRNL). It should be noted that the safety systems at SRS are the highest priority and are well maintained and highly reliable. Due to their function, Safety Systems are prioritized over other equipment for corrective maintenance and for modifications and no compromise is made on maintaining equipment important to nuclear safety.

Costs continue to increase for temporary fixes to keep the infrastructure in a minimal working order. Therefore, it is critical to establish and maintain a priority list for infrastructure maintenance and upgrades. Upgrades to infrastructure can consist of projects, modifications, and repair work. The main drivers include facility life extension, safety (DSA) revisions and requirements from new missions. SRNS utilizes many tools to identify system deficiencies such as system health reports, functional tests, calibrations, operator rounds, and proficiency runs. Repair work is handled through Work Management system and is performed by Maintenance and Construction. Lewczyk noted that the overall site trend for repair work is positive and that modifications are managed through a prioritization system for design and field installation work. SRNS is working to reduce redundancies and while increasing planning and execution of the corrective maintenance backlog. In calendar year 2014, there was a decreasing trend in the number of planned hours which indicates more work performed efficiently which reduces the maintenance backlog. SRNS also plans outages to address a lot of similar repair work in a facility at once which decreases the overall system down time.

SRNS utilizes several tools to define facility needs, ensure resources are being applied, and prioritize needs to support funding decisions. A specific example of a tool used is the Critical Infrastructure Integrated Priority List. The amount of available funding is an important factor in which items will be worked during the Fiscal Year. SRNS will continue to work closely with DOE to identify and address infrastructure needs while looking forward to other avenues, such as

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new missions, for infrastructure funding. SRNS is in the process of consolidating buildings and site services to reduce infrastructure demands and continues to explore and support innovative approaches to addressing the challenges of aging infrastructure.

Kim Hauer discussed the methods Savannah River Remediation (SRR), the liquid waste contractor at SRS, is using to address aging infrastructure. SRR receives facilities from SRNS and the system plan has clear, defined boundaries. The main risks to the liquid waste system are air, steam, and waster, all which operate with antiquated instrumentation. SRR has developed liquid waste system planning tools to recognize infrastructure risks in the short, mid, and long term. SRR is primarily responsible for operation of the tank farm; the Defense Waste Processing Facility (DWPF), and the Saltstone Production Facility. Both DWPF and Saltstone are single production lines with single point failures. DWPF has redundancy only in the safety systems and most of the repairs have to be made remotely. There is concern that when the Salt Waste Processing Facility comes online, the increased specific activity of the waste processed at Saltstone will limit the amount of hands on work that can be performed. While funding limitations require accepting some risks for downtime, safety is never compromised. In 2014, SRR made significant investments to restore infrastructure and improve plant reliability for both processing facilities. The production availability of DWPF was 90% or above for three quarters of FY14 and Saltstone increased daily run effectiveness based on run duration (availability) and quantity produced (performance) on planned run days.

The Tank Farm presents another set of infrastructure challenges for SRR. Many Tank Farm facility systems are old, outside, and underground and single point failures exist throughout the production flow-sheet. Redundancy exists in safety systems only. When SRS was built, the focus of the tank farm was storage, whereas now the focus is closure. Configuration management was not a priority, the installed system design is not optimum for new mission usage and the processing facilities require steady and consistent feed delivery. Reliable infrastructure needed to perform waste tank transfers as scheduled (e.g. steam, water, air). In FY14, significant investment was made to restore infrastructure and improve the reliability of the tank farm. Hauer highlighted several failures of transfer line jackets that are about 50 years old. He noted the challenges associated with repairing the lines in radiological condition and pointed out that most likely these cases are not unique to transfer line jackets of that age. Another significant infrastructure challenge SRR faces is the condition of well water headers that are over 50 years old and have been a significant problem in the last 5 years.

SRR has used Lean techniques to reduce the corrective maintenance backlog. By improving efficiencies in planning and execution, adding additional field execution resources, the backlog has been reduced by almost 5 weeks. SRR has also implemented “fix it now” tasks that have led to a 10% increase in schedule effectiveness and simplified work construction. SRR executes a single integrated System Plan aligning stakeholder goals and values with project execution. The Nuclear Safety Culture is always nurtured; safety systems are maintained, monitored, and visible to senior management. SRR has invested approximately 11% of its overall budget in infrastructure risk mitigation. However, while these core attributes are yielding expected and predictable performance for the Liquid Waste mission, aging infrastructure will continue to present mission challenges and will continue to require investment and close management attention.

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Jeannette Hyatt closed out the panel discussion by announcing a new SRNL initiative that has just authorized by DOE at CD0. This initiative is a Nuclear Chemical Manufacturing Collaborative facility that will foster partnerships with industry and academia to develop innovative solutions and create new sustainable approaches to the EM mission at SRS. This initiative will also help develop the workforce in the local community and leverage expertise from across the EM complex. It is an exciting new venture between SRNL and DOE-EM to develop new sustainable approaches to the nuclear waste challenges at SRS and the EM complex.