

**PANEL SESSION 40 - US Featured Site: DOE Savannah River –
Accomplishments and Challenges**

Co-Chairs: Jack Craig, *US DOE – EM*;
David Moody, *Manager, US DOE- Savannah River Operations Office*
Reporter: Dawn Haygood, *Savannah River Nuclear Solutions*

Panelists Included:

- David Moody, *Manager, US DOE- Savannah River Operations Office*
- Dave Olson, *President & Project Manager, Savannah River Remediation*
- Roy Schepens, *Vice President, Parsons Infrastructure and Technology Group*
- Garry Flowers, *President & CEO, Savannah River Nuclear Solutions*
- Terry Michalske, *Director, Savannah River National Laboratory*
- Kelly Trice, *President & CEO, Shaw AREVA MOX Services*
- Donald Bridges, *Chairman, SRS Citizens Advisory Board*

Approximately 150 individuals were present to hear this session on the US DOE featured site. Following introductions, Co-Chair **Jack Craig** opened the proceedings. The purpose of the panel was to showcase recent progress and planned efforts in radioactive waste management, waste disposition, environmental remediation by the SRS landlord and contractor representatives. Jack Craig noted that the session would begin with an update on the progress and perspectives of SRS as a long-term national asset from DOE senior management to be followed by the perspectives of the various contractors and citizens advisory board. He noted panel discussion would also highlight future contributions of SRS as it serves as a gateway for nationwide nuclear materials consolidation and ultimate disposition.

Dave Moody discussed the history of SRS as a national long term asset. Originally established in 1950 to support national defense missions, today SRS is a multi-program Site with national missions including DOE Environmental Management and National Nuclear Security Administration. Dr. Moody noted the skilled workforce of approximately 12,000 and discussed the Site budget of approximately \$2.4 billion. Dr. Moody stated that the EM mission is to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production and government-sponsored nuclear energy research. He discussed EM priorities and progress in getting the job done.

Dr. Moody talked about the impact of the economic stimulus funding at SRS, noting that over 3500 jobs had been saved or created and more than \$459 million in contracts awarded with 62 percent going to small businesses and 36 percent to local businesses. DOE goals of 75 percent footprint reduction and disposition of legacy transuranic waste have been accelerated through the American Recovery and Reinvestment Act.

Dr. Moody also briefly discussed liquid waste operations, NNSA programs and future missions for furthering national security, energy independence and environmental stewardship. He closed by noting that the focused priorities for the SRS Team are to execute all work safely, accelerate cleanup and reduce risk, maintain perspective, demonstrate the ability to deliver and maintain national security for the country.

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Dave Olson provided an overview of liquid waste operations at SRS. Savannah River Remediation (SRR) is the single liquid waste operations contractor and began work in July 2009. With a workforce of approximately 2,600, the company is focused on acceleration of the liquid waste mission. He noted that the South Carolina Department of Health and Environmental Control considered high level waste at SRS the highest environmental risk in South Carolina. Mr. Olson noted that SRR operations employees had the lowest total recordable case rate of any major SRS contractor in over 25 years and presently stand at over three million safe hours in operations. There have been no recordable injuries since work began in Recovery Act work and no reportable radiological events, notices of violations or reportable spills.

Mr. Olson discussed the challenge and the inventory of high level waste to be dispositioned, noting there are 35-37 million gallons of waste scheduled for closure by 2022. Most of the volume is salt and the bulk of the curies is in sludge, he said. Mr. Olson noted tank closure progression stating that four tanks would be ready for closure a year from now. He also stated that SRR had recently poured the 3,000th canister of glass and is nearly half way finished with the mission. The Defense Waste Processing Facility has poured more than 12 million pounds of vitrified waste and there is a need for a third glass waste storage building. Mr. Olson also discussed salt waste treatment and interim processing supporting tank closure. He noted that new technologies have suppressed life cycle and will increase rates by three to four times faster for closure documentation. Over the next 12 months, additional technology improvements will be deployed in the liquid waste system and 22 tanks will be closed by 2018, four years ahead of the federal and state requirements. The high level waste mission will be complete by 2026 realizing a six year and \$3 billion lifecycle savings, he said.

Roy Schepens provided an update on the Salt Waste Processing Facility (SWPF) at SRS. With safety as the top priority, he noted that Parsons is responsible for the design, construction and ultimate operations for the first year of this facility. He commented on the arrival of two contactors weighing approximately 90 tons each that were transported from Nashville on 215-foot-long “super trucks” and the specialty crane that was used to transfer the contactor modules from the trucks to their final location inside SWPF. He then discussed the overall project schedule which calls for construction to be complete by late 2012 and start up with an 80 percent confidence level in October 2015. He noted Parsons was on track for an early start date of July 2014.

Mr. Schepens showed various photographs of construction progress and a 3-D model of the actinide finishing facility, noting this model had been very beneficial for workers responsible for installing equipment in developing work packages. He presented facts about the project, which is a Hazard Category 2 Non-Reactor Nuclear Facility being constructed to process approximately 37 million gallons of SRS liquid and salt cake waste. The design life is 40 years and design processing throughput is approximately 9.4 million gallons per year. Construction quantities include 114 vessels, tanks, HXs, filters, and engineered items; 45,600 cubic yards of concrete; 5,500 tons of structural rebar and steel; 115,000 linear feet of conduit; 690,000 linear feet of wire and cable; 120,000 feet of piping and 4600 valves.

Mr. Schepens discussed project challenges, notably procurement and quality assurance. An integrated pilot plan with a simulated tank farm was demonstrated in Aiken, SC, for which Mr.

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Schepens provided photographs. He also showed photographs of the SWPF walls, HEPA filter room, the onsite piping fabrication shop and piping. Mr. Schepens closed by noting the unique features of SWPF and its commercial grade dedication program.

Garry Flowers provided an overview of Savannah River Nuclear Solutions (SRNS) noting its exemplary safety performance, which was recognized by the National Safety Council. Savannah River National Laboratory is recognized as the safest lab in the DOE complex for six consecutive years. Mr. Flowers noted Voluntary Protection Program recertification, which was obtained in August and that SRNS and SRR were the recipients of the STAR of Excellence and 3rd Legacy of STARS.

Mr. Flowers discussed the SRNS scope, which is equally divided between EM and NNSA. The SRNS EM mission is to safely and efficiently operate and clean up the Site while protecting the public health and the environment, so as to position the Site for the future. Maintaining a safe, secure and compliant posture is a priority along with SRNL operations, used nuclear fuel storage, receipt and disposition, special nuclear materials consolidation, processing and disposition, area closure, transuranic and mixed/low-level waste disposition, infrastructure upgrades and new missions.

Mr. Flowers noted that SRNS was committed to a 75 percent footprint reduction by 2012, the decommissioning of three reactors and legacy transuranic waste disposition of 5,000 cubic meters. The American Recovery and Reinvestment Act provided \$1.4 billion in funding to achieve these goals and to date, SRNS is approximately 61 percent complete, with 52 percent footprint reduction achieved, reactor decommissioning 75 percent complete and 1,030 cubic meters of TRU waste shipped to the Waste Isolation Pilot Plant. He also showed videos of the K Cooling Tower implosion and the dome removal at the Heavy Water Components Test Reactor.

Mr. Flowers discussed H Canyon as a national asset and noted the progress and accomplishments of H Canyon, HB Line, L and K Areas and SRNL. He also discussed progress in Nuclear Nonproliferation with the Pit Disassembly and Conversion Facility and the Waste Solidification Building; and progress in Tritium Programs. Mr. Flowers closed with discussion regarding future missions and the potential role of small modular reactor technology at SRS.

Terry Michalske provided an overview of SRNL, noting he was enjoying his new role as lab director and thanking Dr. Moody for the partnership among leaders at SRS. He commented that SRNL was happy to play a central role in the new vision for SRS' future. Dr. Michalske discussed the evolution of SRNL, which was established in 1951 as the Savannah River Laboratory. With a staff of approximately 945, the lab executed 200 activities last year and has incurred no recordable injury since August of 2009, which is impressive given the broad set of activities, he said. Dr. Michalske noted that SRNL is a multi-program lab that puts self interest aside to solve problems for the nation in environmental management, national and homeland security and energy security.

Dr. Michalske noted that SRNL innovation impacts broad national priorities and specifically discussed FBI forensics, tracking and tagging technology and testing of SODAR to measure off-shore wind. He commented that SRNL is the DOE Hydrogen Center of Excellence and is

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involved in large academic partnerships, such as the one with Clemson looking at wind turbine trains.

Dr. Michalske stated that SRNL is developing a new roadmap for science and technology to focus on the most critical challenges of the EM program. One of the challenges is to find a way to effectively capture and transfer knowledge, he said. Dr. Michalske also discussed the SRS Clean Energy Initiative, which will require us to utilize the resources we have in place and various other concepts, such as small modular reactor technology and advance reactor concepts. He noted that to be effective as a nation, this will require a strong partnership with industry.

Kelly Trice provided an update of the Mixed Oxide Fuel and Fabrication Facility (MOX). The mission of MOX is to convert at least 34 metric tons of U.S. weapons-grade plutonium to mixed oxide fuel for use in commercial power reactors. The project implements an international agreement with Russia where they will also dispose of 34 metric tons of surplus weapons-grade plutonium. The MOX Project safety performance remains excellent with nine million man-hours worked since start of construction and currently more than two million hours without a lost time accident. Over 50 active environmental permits are being managed with no violations to date.

Construction of MOX began in August 2007 and hot startup is slated for October 2016, with eight MOX fuel assemblies complete by December 2018. The construction schedule includes 16 months of contingency. Hot startup is currently tracking to begin the summer of 2015. The MOX project includes 18 buildings modeled after two plants in France and will consist of 140,000 cubic yards of concrete, 85 miles of pipe and over 15,661 tons of rebar. To date, 38 of 73 tanks have been installed and six million feet of electrical cable have been installed. There are 294 process systems to be installed. The facility will be able to produce up to 70,000 fuel pellets per day and is designed to produce 17x17 power fuel assemblies. It can be modified to make other fuel types. Approximately 151 fuel assemblies can be produced annually utilizing 70 metric tons of heavy metal.

Mr. Trice provided a licensing status and discussed MOX employment, with 1800 people on site and 4500 jobs supported across the nation (MOX suppliers). Mr. Trice shared photos depicting construction progress and glove box assembly and testing. Overall, MOX is a \$4.86 billion project.

Don Bridges provided perspective from a citizen's point of view. He stated that the Citizens Advisory Board (CAB) is an exercise in citizen participation in order to improve or impact policy formation and decision making. The SRS CAB is an Outreach Program by Environmental Management to provide information, advice and recommendations to DOE on issues relating to cleanup. It provides a forum for communications between DOE and the public and is one of eight site-specific advisory boards within the DOE Complex.

The SRS CAB was established in 1994 under the authority of the Federal Advisory Committee Act and consists of 25 citizens who represent diverse interests. CAB members are volunteers and unpaid. The CAB is organized into four issues-based committees, meets bi-monthly and develops annual work plans within the guidelines established by DOE. They are restricted to environmental management issues.

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Mr. Bridges commented that cleanup at SRS is approaching 20 years and if not careful, they may cleanup longer than they produced. He stated he found it interesting that cleanup costs \$60-70 billion, when it only cost about \$1 billion to build SRS. Things have changed and cleanup is a formidable task, he said. It's one of the most daunting cleanup tasks ever undertaken. The vast scope of the cleanup effort validates the wisdom of having stakeholder involvement and the CAB has served as an effective medium for public involvement. Since establishment in 1994, the CAB has a notable record of 275 recommendations to DOE.

Mr. Bridges asked "What does the citizen want?" SRS cleaned up in a timely manner to regulatory standards, continued defense-related missions, SRS postured to accept new missions that builds on Site capabilities and provides jobs, and SRS maintained as a national asset as a National Environmental Research Park, he answered. He closed by restating that SRS has a daunting task – a 40-year cleanup- and is halfway there and that the SRS CAB thinks it's been a success and asset to the area.

Questions and Answers:

Why are you putting H Canyon in standby mode for one to two years at minimum staffing and how hard will it be to turn in back on, get it back up and running?

Dave Moody responded that there's standby and then there's standby. DOE is moving to flush the canyon but we're not going to cold standby, he stated. We will continue some work. We are deferring dissolution of used fuel but looking at a new disposition campaign in HB Line of off-spec plutonium and looking to disposition to WIPP rather than dissolve and putting in our tanks. It's a new start and a change in the way of doing business, Moody said. We will continue to use H Canyon for Analytical Labs and will initiate R&D to convert "non-moxable" plutonium into a "feedable" form to MOX. We are also working with NE to look at technologies that will benefit the nation and while we are awaiting the Blue Ribbon Commission recommendations, there is some R&D work we can do now. PU238 is needed for space mission and we are evaluating a proposal to cost effectively provide plutonium to NE as well. Warm standby of dissolvers and continued operations without bulk dissolution of used fuel is a better description, answered Moody.

Garry Flowers responded that SRNS is working with Dr. Moody in a collaborative effort and the one thing he brings to the table is how to operate in a cost efficient manner, by executing and bringing commercial best practices and eliminating duplicate efforts. "I'm not just here to earn fee" said Flowers. "I'm here for the long haul, looking at reducing costs and what needs to be done to keep the lights on."

SRS has been through a huge transition and there is now a number of contractors. Has there been effective integration?

Dave Moody responded that the contractor leads should really respond, however one thing that is key is that there be a clear delineation of scope. He noted Garry Flowers has the hardest job as the M&O contractor owning infrastructure. He also stated that there must be clear communication between entities and issues cannot go unresolved. Issues must also be resolved to the greatest extent mutually acceptable to all parties, he said. There must be tremendous respect and professionalism in all endeavors and there must be a shared commitment in the future of SRS.

Garry Flowers commented from his 15-month perspective questioning the cost efficiency of splitting the contracts. He stated SRNS works well with SRR but its difficult not to duplicate efforts. He would rather have one contract, but it's operating pretty well, he said.

Dave Olson stated that the functional managers are zippered together and operate off common platforms. The site looks to the same leadership and has to communicate and collaborate in execution. "We're all in a fishbowl together," he said.

What is SRS history in working with small businesses?

There are set asides for small business and SRS is meeting its quotas. There are small business goal targets and the contractors are held accountable. It's part of the contract accountability structure. Over \$300 million has gone to small businesses under Recovery Act. SRS has a tremendous track record of working with and supporting small business.

How do you think the NRC and DOE relationship regarding WIR is working?

Dave Olson responded it is tedious and that early on with Saltstone, the Nuclear Regulatory Commission, Governor's Nuclear Advisory Council and the Department of Health and Environmental Control all had differing objectives. Working groups were set up with the NRC to on WIR and F Tank Farm, but the proof will be in document review to the finish line, he said.

What is the curie amount in the 3,000 canisters poured?

John Dickenson, SRR, responded that there were approximately 40 million curies in glass.

What are the sampling requirements for designing the lab section of the Salt Waste Processing Facility?

Roy Schepens responded 30,000 gallons per day, which was the reason they enlarged the lab to meet this throughput.

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