

● OCTOBER 2016

SAVANNAH RIVER NUCLEAR SOLUTIONS



SRNS Today



D Ash Basin Phase 1 complete

Progress continues
on cleanup of coal ash
from decades past

This month

Plutonium down-blending • Natural remediation • FIT for success • Safety Expo • 25-Year Reception





Stuart MacVean
SRNS President and CEO

Welcome

to the October 2016 edition of

SRNS Today

It's great to be back
at the Savannah River Site.

I am honored to serve as the President and CEO of Savannah River Nuclear Solutions, and I'm looking forward to building on the great work accomplished under the leadership of our outgoing President and CEO Carol Johnson.

This month's issue of SRNS Today is filled with stories that underscore our company's ongoing dedication to modeling operational excellence.

On the next page, we've highlighted our accomplishments that occurred in fiscal year 2016. It's an impressive array of achievements that support the missions of our Department of Energy and National Nuclear Security Administration customers.

Employee engagement is fundamental to our company's success, as evidenced by our growing Focused Improvement Transformation. Through these continuous improvement activities, we're saving millions of taxpayer dollars while streamlining our operational and administrative processes.

Savannah River National Laboratory is taking steps to become an independent business unit within the SRNS management and operations contract. The lab supports the DOE Office of Environmental Management sites across the DOE complex and numerous international customers as well. This move will enhance SRNL's strategic relationship with DOE-EM.

I'm looking forward to continuing the successes of SRNS as we make the world safer. The future is promising, and I'm eager to see SRNS continue to progress.

I hope you enjoy this edition of "SRNS Today." As always, thank you for your interest in Savannah River Nuclear Solutions.

Savannah River Nuclear Solutions, LLC, is a Fluor-led company whose members are Fluor Federal Services, Newport News Nuclear and Honeywell. Since August 2008, SRNS has been the management and operating contractor for the Savannah River Site, a Department of Energy-owned site near Aiken, South Carolina, including the Savannah River National Laboratory. The SRNS corporate and community offices are located in the renovated 1912 "Old Post Office" building in Aiken, S.C. The primary initiatives of SRNS are national security, clean energy and environmental stewardship. SRNS Today is published monthly by SRNS Corporate Communications to inform our employees and other stakeholder of the company's operational and community-related activities. If you have questions or comments, please contact us at 803.952.9584 or visit our website.

www.savannahrivernuclearsolutions.com



SRNS FY16 Highlights

At the beginning of each fiscal year, SRNS provides a self-assessment to DOE, which highlights the past year's accomplishments and challenges. The fiscal year 2016 (FY16) SRNS Self-Assessment was submitted to DOE at the beginning of October. Below is a short summary.

Despite ending FY15 on what could be considered a negative note, SRNS began FY16 with an Operational Pause that profoundly and positively impacted the SRNS safety culture and led to improvements in the conduct of vital environmental and national security missions.

Some of FY16's highlights include:

- Received 15th DOE Voluntary Protection Program Star of Excellence
- Achieved zero reportable employee or personal effects contamination events
- Emergency Preparedness Evaluated Exercise recognized as "outstanding" for demonstration of emerging best practices
- Restarted operational processes in H Canyon including dissolution of two batches of spent nuclear fuel and two runs each of First Cycle, Head End and Second Uranium Cycle
- Completed High Flux Isotope Reactor activities for an upcoming mission
- Achieved readiness for Target Residue Material receipts
- Effectively managed receipts in L Area, including a newly configured type of spent fuel
- Achieved readiness and began plutonium down-blending in K Area
- Met 235-F Risk Reduction and Solid Waste Management milestones ahead of schedule
- Met 100 percent of FY16 National Nuclear Security Administration deliverables on schedule
- SRNL transitioned to separate, independent business unit

SRNS refocused and strengthened operations by improving procedures, training and issue resolution. As part of the Operational Performance Improvement Plan (former Sustainment Plan), SRNS actively

engaged employees in monthly, half-day pauses for six months and also improved the Contractor Assurance Program. These actions shaped a healthy culture of self-awareness where employees recognize and resolve immediate and long-term issues.

Cost savings and a renewed focus on the workforce further enhanced performance excellence in FY16. SRNS widened the scope of its Focused Improvement Transformation (FIT), a company-wide Continuous Improvement program that identified 180 initiatives and saved \$31.6 million in taxpayer dollars thus far. SRNS also instituted a number of "best business practices" to remake our business.

SRNS made significant progress in mitigating the "retirement cliff" possibility, including the hiring of more than 435 full service employees and 171 limited service employees. SRNS also implemented a number of initiatives, such as aesthetic improvements, access to onsite gyms and new collaboration spaces across the site to retain employees and make SRS a compelling place to work.

Throughout the year, SRNS has continued to improve, grow and produce better quality results and looks forward to new opportunities as the company works to solve some of the nation's most crucial challenges. SRNS makes the world safer, as our performance demonstrated in FY16.



L Area Receiving Basin at SRS

Plutonium down-blend

SRNS begins operations to prepare for shipments out of S.C.

SRS employees have begun an operation that will result in the processing and permanent disposal of six metric tons of surplus non-pit plutonium.

The down-blending process, now underway in the SRS K Area Complex, blends plutonium oxide with an inert material, producing a mixture that is more secure and not usable for weapons. The startup of this work resumes a process that SRS successfully carried out in the HB Line Facility in 2012 to down-blend plutonium. After material is diluted it will be stored at the SRS Solid Waste Management facility and, as stated in the Record of Decision (ROD), will be placed in the appropriate queue of material that will ultimately be disposed of at Waste Isolation Pilot Plant (WIPP).

The Energy Department's decision to down-blend this material and ship it to WIPP was announced in March and published in the Federal Register on April 5 as the ROD on the Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement.

This project does not involve plutonium originally intended for disposition through the MOX Fuel Fabrication Facility. However, this is the same down-blending process that NNSA has proposed as an alternative to the MOX approach.



"We often describe our job as 'making the world safer,' and today is a day when we can point to a specific task that exemplifies that description."

Dave Eyler



"SRS performs an invaluable role in addressing national security and nonproliferation objectives," said Jack Craig, SRS Manager. "With today's startup, we are taking an important step in fulfilling the Energy Department's commitment to move plutonium out of South Carolina and into permanent disposal."

Extensive preparations for the startup included a revision of the facility's safety analysis to reflect the down-blending process, developing operational and safety procedures, training personnel on the down-blending process, and performing a readiness assessment to demonstrate that the facility's workforce and equipment are prepared to begin down-blending operations.



D Ash Basin Phase 1 complete

Progress continues on the cleanup of decades-old coal ash

In 2013, an innovative new technology involving the generation of steam and power through the burning of renewable energy from items such as forest debris, agricultural waste and scrap lumber (biomass) resulted in the closure of the SRS D Area powerhouse, a large, coal-burning facility built in 1952.

The powerhouse was capable of generating 75 million watts of power; however, the five-story structure also generated coal ash year after year until it was shut down in 2012.

SRNS is making progress on a five-year, multi-phase plan to successfully clean up approximately 1.6 million cubic yards of coal ash generated over the decades by the powerhouse.

Phase One of this project recently consolidated 80,000 cubic yards of ash and dirt onto an existing ash landfill in D Area about 17 football fields in length, creating one highly-protected mound.

"Cleaning up this site is in the best interest of the environment, SRS and South Carolina," said SRNS D Ash Project Manager Susan Bell. "This is particularly true given the earthen berms created to make the large, pond-like basins used to store the ash were constructed in the 1950s, a generally accepted practice at the time."

The SRNS project team and their contractor then protected the huge soil and ash mound from rainwater by using layers of earthen materials followed by long sheets of a specially manufactured barrier that is rolled out, covering the entire mound.

The layering system ensures that rainwater cannot seep into the coal and ash, protecting the groundwater beneath from contamination.

The protective cap for the mound required two layers of manufactured geosynthetic material, each measuring 827,000 square feet in size, followed by clean soil and grass sod. Working together, the layers redirect water away from the ash-filled mound.

This project is a result of a closure plan developed and approved by a core team consisting of members of DOE-Savannah River, SRNS and state and federal environmental regulatory agencies. The plan uses proven technology and methods successfully implemented in the past to close contaminated basins at SRS.

"We're confident our project team will see excellent results in the future because of an insistence on best safety practices, innovative engineering and the use of state of the art materials," said Bell. "This project is another example of how SRS puts science to work to make the world safer."

Phase Two of the project has begun and will safely and efficiently consolidate the remaining 335,000 cubic yards of ash into a second mound, totaling about 584,000 cubic yards. Like the first mound, it will also be capped with two layers of geosynthetic material, a thick earthen cover consisting of fill dirt and grass-covered topsoil.

Since 2008, SRNS has cleaned up 85 percent of the Site's 310 square miles to industrial standards, with verification provided through local and federal regulatory agencies.



K Area Complex at SRS

FIT TRANSFORMATION

SRNS, taxpayers reap the benefits of continuous improvement

In fiscal year (FY) 2016, SRNS netted over \$31.6 million in productivity and efficiency cost savings as a result of the SRNS Focused Improvement Transformation (FIT), a company-wide Lean management system that applies process improvement concepts to eliminate non-value-added work.

“For the past two years, we’ve focused on Lean, not as merely a set of tools, a new fad for business processes or a ‘one-size-fits all’ solution. It’s been about people making their work life better and more efficient, changing the culture one day at a time,” said P.K. Hightower, Manager, SRNS Continuous Improvement.

An increase in employee involvement has been key to this highly successful year, with nearly 30 percent of the SRNS workforce actively engaged in Continuous Improvement activities.

Over the past year, SRNS employees completed 24 “Rapid Improvement Events,” or RIEs, which are “deep dives” into how a process currently works, how it should work and how it could look in the future. A few examples of the RIEs from FY16 include chemical management and storage, the Quality Assurance corrective action process, employee training documentation, the SRS Public Tours program and month-end financial closing.

SRNS has also completed 10 Value Stream Analyses, which are in-depth looks at all the activities (both value-added and non-value added) required to deliver a specific product or service to a customer.

One example of a FIT initiative from FY16 has resulted in a new and improved process for calibrating M&TE (Measurement and Test Equipment) pipettes for F/H Laboratories, which analyzes soil, water, gases, decommissioning debris, waste and process control samples to support SRS missions as well as other DOE sites.

To help ensure the most cost-effective methods for using M&TE pipettes (a tool used to transfer or measure out small quantities of liquid), employees from Analytical Laboratories mapped out the process for obtaining pipettes during a RIE. The team discovered the pipette vendor could calibrate the pipettes for \$44 per pipette. The RIE is projected to save the company over \$396,000, which includes the cost difference between \$188 and \$44 for each calibration and the hours saved from the significant decrease in turnaround time. Additionally, an annual \$344 recalibration cost for every pipette in the laboratory will be eliminated.

“I’ve got a lot of energy for the FIT program,” said Stuart MacVean, SRNS President and CEO. “Fiscal year 2016 was a big year. It’s really amazing what employees have accomplished to streamline different processes in a highly-regulated environment, ultimately saving significant taxpayer dollars.”

In 2015, SRNS hired Simpler Consulting, a proven leader in Lean transformation, to help develop Lean experts within the company. Simpler continues to help implement FIT to improve employee satisfaction, reduce costs, increase productive capacity, improve quality and timeliness of product delivery, and increase value to SRNS customers.

\$31.6 million

SRNS Savings Through FIT

24

Rapid Improvement Events

10

Value Stream Analyses

30%

SRNS Workforce Engagement in FIT

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Stuart MacVean

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SRNS engineers Gerald Blount and Jeff Thibault inspect equipment used as part of an innovative process to remove low-level contamination from groundwater at SRS.

Natural remedy

‘Living remediation’ removes contamination, benefits ecosystem

60

acres of trees are being used by SRNS as a living remediation system—all part of an innovative process to remove low-level contamination from groundwater contained near the center of SRS.

A small pond-like excavation was created in the path of slowly-moving groundwater contaminated with tritium. The pond acts as a short-term holding basin, as the groundwater continuously seeps into it. An inexpensive irrigation system is used almost daily to safely manage water levels.

“We use an extensive, above-ground system of plastic pipes and sprinkler heads to irrigate the 60 acres with water pumped from the pond,” said Gerald Blount, SRNS geologist. “It’s ‘man working with nature,’ using thousands of trees to safely absorb the radioactively-tainted water, naturally evaporating it to the atmosphere.”

Blount explained that most of the water evaporates when it is sprayed into the air or as it lies on the forest’s ground cover and, in the process, releasing the hydrogen-based contaminant into the air. The rest of the water is used by the trees, ensuring a healthy ecosystem as they never have to experience drought conditions.

“We know that the levels of tritium we’re seeing here do not represent an ecological issue. It does not biologically accumulate, and the energy associated with tritium is not going to create any kind of negative effects on the plants and animals in the area,” said Blount.

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“It’s ‘man working with nature,’ using thousands of trees to safely absorb the radioactively-tainted water, naturally evaporating it to the atmosphere.”

Gerald Blount

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“Multiple studies have confirmed this. In fact, the trees and animals receiving the irrigated water are flourishing.”

The half-life for tritium is 12.3 years. After a little more than 12 years, half of the nuclear activity is gone. “Photosynthesis and the fact that this particular nuclide quickly moves through the vegetation along with water means the trees can be harvested and sold for lumber after one or two years without irrigation,” said Blount.

The small amount of tritium released into the air with each irrigation cycle is negligible considering it is dispersed into and is mixed with the enormous volume of air that makes up the earth’s atmosphere. Blount noted that the levels of tritium in the area after irrigating are so low that it is safe for SRNS workers to move about the irrigated area as needed without any form of protective clothing.

To date, more than 120 million gallons has passed through the piping. As an added bonus, the process generates no waste.

Big step

National Laboratory begins transition as separate business unit

Savannah River National Laboratory began its transition to a separate organization on Oct. 1. The lab will operate as a separate business unit within the existing SRS management and operating (M&O) contract with SRNS.

The lab supports the DOE Office of Environmental Management (DOE-EM) and all of its sites across the DOE complex. Until now, it has been unique among the network of DOE National Laboratories as the only one operating within the larger M&O contract at SRS.

Earlier this year, reports from the congressionally chartered Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL) and the Secretary of Energy Advisory Board (SEAB) Task Force both recommended ways to reinvigorate the relationship between DOE and its labs.

“The Secretary of Energy has placed a high priority on strengthening the relationship between DOE and its network of national laboratories,” said Jack Craig, DOE-EM Savannah River Operations Office Manager. “This transition will enhance the independence of the laboratory and its strategic relationship with its sponsor, DOE-EM.”

“Increasing SRNL’s independence will improve our ability to be nimble, responsive and efficient in delivering our mission,” said Dr. Terry Michalske, SRNS Executive Vice President and SRNL Director. “It’s an important step in SRNL’s growth as we expand capabilities of the lab to solve national and global challenges.”

The lab’s relationship with SRNS via the M&O contract for SRS will continue for the two years remaining on the SRNS contract. The changes going into effect now enable SRNL to implement business and management processes specifically aligned with the mission needs of the lab and its diversified client base.

A phased approach to establish SRNL as a separate business unit began earlier this year and will be fully in place by March 30, 2017. Funding through the M&O contract remains unchanged for the



SRNL scientist Elizabeth Roach conducts research on energy dispersive spectrometry.

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“Increasing SRNL’s independence will improve our ability to be nimble, responsive and efficient in delivering our mission.”

Dr. Terry Michalske

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remainder of the contract period.

A cornerstone of the CRENEL and SEAB Task Force recommendations is to ensure that all national laboratories are governed by DOE and operated within their contracts to maintain a close, strategic relationship with DOE; provide unbiased technical assessment and support to the U.S. government; and be fully defined and transparent in their structure and operations.



Bob Buckley of SRNL (from left) describes nonproliferation research to SRNS Board members Tom D'Agostino and Greg Meyer.

● SRNS Board visits SRNL

The SRNS Board of Directors visited SRNL on Oct. 18, as part of their October meeting. SRNL provided a walking tour of the B-wing labs, focusing on infrastructure, the SRNL shielded cells and an Engineering Development Laboratory overview. Board members attended a poster session depicting LDRD (Laboratory Directed Research and Development) research ongoing at the National Laboratory. Poster session topics ranged from Functionalized Magnetic Mesoporous Silica Nanoparticles for Uranium and Technetium Removal to Characterization of High Explosives Detonations via Laser-Induced Plasmas and Multi-Component Separation and Purification of Natural Gas.



SRNS Board member Nick Lombardo (left) listens as Dien Li of SRNL describes nonproliferation research.

● Young Minds Grow During STEM Career Connections Day



SRNS employees Missy Byrnes and Kim Mitchell (left) explain potential technical career paths available at SRS to students attending STEM Career Connections Day, recently held at the KROC Center in Augusta, Ga.

The annual STEM Career Connections Day is an interactive forum for students from high schools near SRS considering a career involving science, technology, engineering and math skills.

Nearly 250 students met at the KROC Center in Augusta, Ga., to learn about local career opportunities and interact with professionals in high-tech industries to include nuclear technology, information technology, cyber security and advanced manufacturing.

Over 30 companies and several sponsors, including Savannah River Nuclear Solutions, provided informational displays and a variety of resources to support the event.

SRNS 25-Year Reception

More than 1,200 current and retired SRNS employees attended the annual SRNS 25-Year Reception at the Augusta Convention Center on Oct. 6. The event honors active and retired employees who have 25 years or more of continuous service at SRS.



Keeping it in the SRS family - father and sons (l-r): Jimmy, Glenn and Dale Piercy.



The Remembrance Quilt was created to help raise awareness for those who built our nation's nuclear arsenal during the Cold War.



SRNS 25-Year Reception at the Augusta Convention Center.

SRNS Hosts the 2016 SRS Safety Expo

SRNS hosted the 2016 SRS Safety Expo on Oct. 19 - 20, featuring 60 interactive booths that shared information and services on an array of topics including: safety, health and wellness, environmental stewardship, personal security and continuous improvement. The two-day event was held at the Applied Research Center on Gateway Drive.

Approximately 2,500 attendees from all SRS contractors visited the expo to immerse themselves in the wealth of information and services offered to SRS employees, including free flu shots provided by SRNS.

"I look forward to attending the Safety Expo every year; it is rewarding to work at SRS where employee safety, health and security are core values. The expo is an example of our commitment to those values' and it is always a great opportunity to spend some time learning about important topics from a range of experts and providers," said Ben Blue, SRNS Senior Emergency Management Specialist.

Countless SRS employees play an active role in making the event a success every year. With roughly 30 Local Safety Improvement Teams or LSITs, hosting booths or providing logistical support to the event, the contributions from the SRS workforce make the expo a memorable experience for all who attend.



Employees from The Savannah River Ecology Lab gave SRS Safety Expo attendees an opportunity to have a hands-on experience with some of SRS' diverse wildlife.



SRNS President and CEO Stuart MacVean visited the HB Line booth at the SRS Safety Expo to learn about Human Performance Indicators.

Being a Hero

SRNS employees, corporate match raise \$1.22 million for United Way

Savannah River Nuclear Solutions (SRNS) employees gave back to the community through another successful United Way campaign, achieving over \$1.2 million, which includes the employee campaign and corporate match. To celebrate this milestone, the SRNS campaign committee invited the nine United Way agencies who are designated to receive donations to a celebration at Newberry Hall in Aiken, S.C.

The Savannah River Site has a history of giving. Initially known as the Community Chest, United Way has been a major focus for SRS employees since 1952.

The United Way agencies that receive contributions from the SRNS Employee United Way Campaign include: Aiken County; Allendale County; Barnwell County; Bamberg, Colleton and Hampton Counties; Edgefield County; Midlands; McDuffie County; Screven County; and United Way of the CSRA.



Representatives of the United Way agencies, along with SRNS employees, were on hand for the donation celebration on Oct. 25.

SRS Tour Continues to Surprise and Impress Area Educators



As a part of Nuclear Science Week, dozens of local educators recently participated in an intensive one-day tour of SRS to learn firsthand of the programs and missions performed at the 310-square mile complex. Above and right, teachers learn about SRNS F/H Laboratories.

This is the fourth consecutive year that several facilities at SRS have been opened to local middle school and high school science and math educators, each gathering information to transfer to their students.



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