

● JULY 2013

SAVANNAH RIVER NUCLEAR SOLUTIONS

SRNS Today



SAVANNAH RIVER NUCLEAR SOLUTIONS Education Outreach Report Card

A+

Program	Number of Impacted Students
Traveling Science and Math Demonstration Program	16,249
CSRA College Night	6,000
SRNS Innovative Teaching Mini Grants	3,169
Career Events	178
Introduce A Girl To Engineering	32
Future City	589
Science Bowl	120
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Science Technology Enrichment Program (STEP)	696

Total Number of Students Impacted: 27,249

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Welcome

to the July 2013 edition of

SRNS Today



Dwayne Wilson
SRNS President and CEO



On most maps, the Savannah River Site is a tiny dot a bit south of Aiken, S.C., and across the river from Augusta, Ga. But the impact of those working at that tiny dot reaches far and wide.

SRNS and its work at SRS makes a significant impact nationally, internationally and locally. Our expertise in nuclear materials, our commitment to international collaboration, and our support of the local communities span our counties, our country and the globe.

Our nation's leaders and their staff often visit SRS to enhance their knowledge about the work we do here. Recently, U.S. Senator Tim Scott and key Congressional staffers visited the Site for briefings and tours of key facilities (see Page 3). SRS plays an integral role in our nation's security, environmental stewardship and energy research, and I'm confident that our guests found that their time spent at SRS was informative and enlightening.

Internationally, we collaborate with companies throughout the world on projects that bring our nuclear materials expertise to the table. An agreement was recently signed in Aiken between the Savannah River National Laboratory and Nuclear Protection Products, a Norwegian manufacturer, on a possible next generation of radioactive material packaging systems for the world's nuclear materials. For more on this, please see the story on Page 8.

Our local education outreach programs afford thousands of students and teachers the opportunity to expand their horizons in the areas of science, technology, engineering and mathematics. For our education outreach formula for success, please see the story on Pages 6 and 7.

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

About Savannah River Nuclear Solutions, LLC...

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 stakeholders 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



Visitors of note

SRS hosts Sen. Scott, Congressional staffers



U.S. Senator Tim Scott (right) receives a briefing on the nuclear materials disposition program at SRS from Steve Howell, SRNS Deputy Director for Environmental Management Operations.

SRS hosted U.S. Senator Tim Scott and several key Congressional staff in July. In his first visit to SRS, Senator Scott toured several facilities including H Canyon, MOX and F Tank Farm. He also received briefings on the Site's Tritium Facilities and the Salt Waste Processing Facility. Joe McKeown, the Senator's Executive Director for the North Charleston Office, also participated in the tour.

SRS also hosted Andrew King, Deputy Chief of Staff to U.S. Senator Lindsey Graham, and Tom Craig, Minority Clerk for the Senate Energy and Water Appropriations Subcommittee. Mr. King and Mr. Craig spent a day at the Site visiting all of SRS' major operational facilities as well as receiving an overview of the Savannah River National Laboratory.

SRNS Board of Directors



The SRNS Board of Directors met July 23-24 at the Hydrogen Center near SRS. During their visit, members of the Fluor Corporation toured the Energy Materials Research Laboratory. Shown in this photo (from left) are Dwayne Wilson, SRNS President and CEO; Garry Flowers, President, FGG Global Services; Bruce Stanski, President, Fluor Government Group; and SRNS Board Chairman Greg Myer, Senior Vice President, Fluor E/N Operations.

Wilson addresses Augusta Chamber on 'why SRS matters'

SRNS President and CEO Dwayne Wilson discussed why SRS matters with area business representatives during the July 25 Augusta Metro Chamber Quarterly Economic Luncheon held in downtown Augusta.

“In sheer economic terms, that’s an easy answer. We are second only to Fort Gordon in terms of employment numbers in this area. In Richmond and Columbia County, the impact of Savannah River Nuclear Solutions alone was more than \$200 million in 2012.” Wilson went on to describe a tradition of service and corporate philanthropy to the communities of the CSRA.

Wilson also discussed SRS's importance from a national strategic perspective. “Beyond economic impact, the Savannah River Site matters because it provides solutions to national issues. All of the economic impact, or philanthropy, doesn’t happen without an important mission.” Wilson described the tritium operations at SRS that deliver the critical tritium component of our nation's weapons system. He emphasized the storage capacity at SRS for nuclear material and discussed the Site's capability to remove excess nuclear materials from other countries. “Our intent is to continue to demonstrate that SRS is a center for nuclear knowledge.”

Wilson concluded with a few pieces of advice for the 2013 Top 10 Young Professionals to Watch, who were being recognized during the luncheon. “Lead by example; eyes are on you, so drive for excellence and every day, do something better than yesterday.”



Multi-year modernization project for Tritium comes to fruition

Capping an effort that has been under way since October 2006, Savannah River Tritium Enterprise (SRTE) operations formally adopted a new replacement for the system that tracks tritium reservoirs throughout their lifecycle. The National Nuclear Security Administration (NNSA), SRTE and Savannah River National Laboratory all rely on the system's data to manage reservoir processing, account for controlled material and maintain a reliable reservoir inventory.

The previous Automated Reservoir Management System (ARMS) was based on hardware and software architecture that were approaching obsolescence, so the solution was a multi-year project to implement its modernized replacement: ARMS II.

“The successful implementation of ARMS II is the result of excellent planning and the long term commitment of a large team of folks, each bringing their individual expertise to the project,” says Dennis Donati, SRNS Senior Vice President for NNSA Operations and Programs. “The team of programmers, computer hardware support personnel, facility engineering, operations, training, procedure writers and others accepted ownership for the success of this project from the start. Their daunting task included programming nearly one million lines of current ARMS code, the effective migration of 25 years of historical processing data, and coordination with all stakeholders across the complex on the details of the outage schedule to ensure no mission impacts.”

In early 2012, SRTE started up one of the ARMS II functions. This forerunner to the full system allowed SRTE to evaluate the user interface design, and produced useful lessons for the final implementation.

Over the course of the project, SRTE performed three separate phases of software testing, and obtained cooperation from across the NNSA Nuclear Security Enterprise to enable a four-week facility outage to complete the implementation. Tritium Operations accepted ARMS II for use on July 16.

Continuous Improvement program at SRNS saves millions through streamlined processes

Employees at SRNS use a program that has helped save \$23.7 million in fiscal year 2012, streamlined processes and rescued threatened facilities at SRS.

During FY12, 16 percent of its workforce, or 852 workers, were actively engaged in the Continuous Improvement (CI) program, which focuses on enabling process improvements. Through CI, SRNS finds ways for its employees to work more efficiently and effectively, after determining where the most value can be gained with the least amount of waste. Eliminating waste, or non-value-added activities, leads to diverse process efficiencies, improved employee productivity and often, monetary savings.

The \$23.7 million is comprised of immediate savings, savings related to the avoidance of future costs or man-hours saved from a streamlined process. Man-hours saved are given back to the worker to take on new scope with existing resources. Improvements implemented from a CI project are validated and monitored to determine their true impact on company goals and objectives. In some cases, these savings are recurring over multiple years.

According to Cynthia Boler-Melton, SRNS CI Manager, “You truly begin to see how large an impact CI can have when you start to add up all of the savings amassed from different projects throughout the year. Before we knew it, we had saved over \$23 million in 2012 and that is why it is so important to constantly use and promote CI regardless of your work function.”

Projects can range from a group assessing the alternatives to purchasing new ambulances to those with a more significant impact on tax payer dollars, such as CI projects affecting a variety of environmental cleanup programs at SRS.

During the SRNS transuranic (TRU) waste program, an American Recovery and Reinvestment Act project, CI principles were used to create an uninterrupted work flow by reducing waiting, motion and transportation wastes. This reduced the average cycle time to load a TRUPACT-III cask, one type of metal container used to ship contaminated industrial waste, from 18 hours to about nine hours. With these improvements, it takes 45 man-hours less to load a container. Without the efficiencies gained through the CI program, it is estimated that completing the removal of Cold War TRU waste from SRS would have taken almost a year longer and \$500,000 more.

“When the H Canyon nuclear chemical separations facility (the only one operational in the country) was not funded for new missions in FY12, we used the CI process to help reduce costs,” said Paul Hunt, SRNS Senior Vice President, Environmental Management Operations. “The results of the CI effort were outstanding with recommendations delivered



The SRNS Continuous Improvement program reduced the average cycle time to load a TRUPACT-III cask, a container used to safely ship radioactive waste to a DOE site in New Mexico, from 18 hours down to nine hours, saving \$500,000 and reaching an important Recovery Act milestone almost a year earlier than originally expected.

at an estimated \$30 million in savings over two years. This way of thinking helped bring our costs down enough to posture the facility for a new mission that essentially saved the facility and many jobs. CI played a key role in this.”

Broadly defined, CI is an ongoing effort to improve products, services or processes. CI at SRNS begins with a framework that is process-based, data-driven and results-oriented. Trained CI leaders assess processes for steps and tasks that can be streamlined, automated or eliminated in some cases.

“The hardest part of starting our CI-Lean journey at SRNS was to convince the workforce that CI principles can be applied in a non-manufacturing process. Once they grasped that a ‘product’ could also be a service or information, they began to apply CI principles to almost every aspect of operations at SRNS,” said Boler-Melton. “Equally important as the savings is our zeal to create a workforce culture that readily identifies and eliminates non-value added activities so that SRNS can bring more value to the customer.”



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Photos (from top):
Introduce a Girl to
Engineering, College Night,
and the Science Technology
Enrichment Program

"The SRNS Education Outreach Program is a tremendous resource. With little or no fanfare, they continue to be an asset to our region's school systems in too many ways to list. They are our unsung heroes, assisting underfunded teachers while bringing scholarships and special learning opportunities to an amazing number of students."

Jeff Howell
Executive Director, Public Education Partners

Education: The Formula for the Future

**Thousands of students.
Hundreds of teachers.
One company's education outreach program.
Add them together, and you get A+ results for local schools.**

Since 2008, SRNS Education Outreach staff and numerous volunteers have reached out to hundreds of schools and thousands of students each year to enhance the quality of education in the greater Aiken-Augusta area.

During the past school year alone, more than 27,000 CSRA students and teachers were directly impacted through 10 SRNS education outreach annual programs and numerous events.

SRNS President and CEO Dwayne Wilson said, "Our Education Outreach programs are helping to mold and shape the minds of future employees for area industry and, potentially, future leaders within our own company."

Since SRNS became the Savannah River Site management and operations contractor, more than 130,000 students and teachers throughout the eight counties near the Site have benefitted from their dedicated efforts to help local students and assist area educators.

Efforts to financially assist teachers include the Innovative Teaching Mini-Grants Program. This competitive program provides funds to CSRA public and private elementary and middle school teachers for innovative ideas. During the past school year, \$75,000 in grants was awarded to 172 teachers.

"We realize that teachers are the foundation of any successful school," said Candice Dermody, SRNS Manager, Education Outreach and Talent Management. "As a pilot program during the summer, we have started an initiative called Educators in Business, which will be a source of on-the-job experience for teachers in Allendale County."

Tens of thousands of young minds have benefited from SRNS education outreach programs whose primary goal is to stress the importance of science, technology, engineering and math (STEM). These STEM-intensive initiatives include the Traveling Science Demonstration Program, Science & Technology Enrichment Program, Introduce a Girl to Engineering and various workshops, tours, lectures and demonstrations. Other science-based programs include competitions such as the CSRA Science Fair, DOE Savannah River Regional Science Bowl, and the Future City Competition.

One of the most popular educational events is the annual CSRA College Night, which is managed by SRNS personnel. Last year, more than 6,000 area high school students participated in this event in Augusta, Ga. More than 160 colleges and universities typically are available at College Night.



SRNL signs agreement to collaborate with Nuclear Protection Products of Norway

“We have worked on a number of multinational partnerships on issues to further improve the safe, secure handling of nuclear materials. We are pleased to enter this partnership with Nuclear Protection Products that has the potential to make a significant contribution to the international nuclear community.”

Dr. Terry Michalske
SRNS Executive Vice President
and SRNL Director

An agreement signed in Aiken sets the stage for collaboration between the U.S. Department of Energy’s Savannah River National Laboratory (SRNL) and Nuclear Protection Products (NPP), a Norwegian manufacturer, on a possible next generation of radioactive material packaging systems for the world’s nuclear materials.

NPP is located in Ilseng, Norway, and develops specialty containers for the storage and transportation of medical isotopes, among other products. The agreement was arranged through the assistance of DOE’s Office of Environmental Management, whose Office of Packaging and Transportation, Packaging Certification Program provides support and oversight for materials packaging and transport within the DOE complex. SRNL is the National Laboratory for DOE’s Environmental Management program.

The Memorandum of Understanding outlines several areas of scientific and technical collaboration, including nuclear material packaging and materials science, and alternative container and packaging concepts and designs. SRNL would serve as a U.S. National Laboratory partner to help validate performance characteristics and to support NPP in the design of a licensable cask for various nuclear and hazardous materials.

“We have worked on a number of multinational partnerships on issues to further improve the safe, secure handling of nuclear materials,” said Dr. Terry Michalske, SRNL Director. “We are pleased to enter this partnership with Nuclear Protection Products that has the potential to make a significant contribution to the international nuclear community.”

The Memorandum of Understanding was signed by NPP President and Chief Executive Officer Jorgen Bertheau, SRNL Director Dr. Terry Michalske, and Savannah River Nuclear Solutions Contracts Vice President John Temple. Also visiting SRNL were NPP Board Chairman Jan Erik Hager and Maryann Locka, Energy Counselor for the Norwegian Embassy to the United States.

Photo: SRNL Director Dr. Terry Michalske (from left) hosting Nuclear Protection Products CEO Jorgen Bertheau, Board Chairman Jan Erik Hager and Maryann Locha, Energy Counselor for the Norwegian Embassy to the United States, in a July visit to SRNL.



Jay Noonkester and Keith Hyde sample groundwater in T Area to evaluate remediation progress

From cooking to cleanup: SRS uses soybean oil in T Area groundwater remediation

A common household product is being used at the Savannah River Site (SRS) to treat groundwater contamination, saving an estimated \$27 million and significantly reducing cleanup time.

Vegetable oil is being used to treat hazardous chlorinated solvents in groundwater beneath T Area, a former laboratory and production facility at SRS. Switching to this biodegradable treatment approach is expected to meet environmental cleanup objectives in one-third the time of traditional techniques, saving millions of dollars of Federal cleanup funds.

T Area, located in the southwest portion of the site, was one of the first operational facilities at SRS and continued in operation until the end of the Cold War. In collaboration with Savannah River Nuclear Solutions (SRNS) Environmental Compliance and Area Completion Projects, researchers at the Savannah River National Laboratory (SRNL) have been working toward improving the efficiency of the cleanup of this facility. In this cleanup technique, soybean oil is injected into wells to treat the groundwater. The oil is able to capture the hazardous solvents by immobilizing it from the groundwater. It then acts to stimulate the growth and activity of microbes. These microbes are able to consume solvents and break them down into harmless byproducts.

“Biodegradable oils, like vegetable or other edible oils, have emerged as an effective treatment at environmental waste sites. Edible oils work in two ways: they contain the contaminants from spreading, and they accelerate natural processes that decompose chlorinated solvents into harmless components,

thereby removing the risk to the environment,” said lead researcher Brian Riha. “Traditional active remedial techniques are aimed at physically removing the contaminants from the soil. They are extremely expensive and frankly, not always effective.”

The groundwater beneath T Area is contaminated by chlorinated solvents that are common degreasing agents. Since the contamination was detected in the 1980s, the area has been treated by a combination of soil vapor extraction and groundwater pump-and-treat systems. Both systems are active treatment remedies and are expensive to operate.

SRS received approval to temporarily discontinue the active groundwater treatment and implement an innovative strategy developed by a team of researchers led by SRNL. This strategy is called “enhanced attenuation.” Enhanced attenuation investigates how nature could rid itself of contamination, and then uses engineering principles to encourage and foster this process, allowing the contamination to be passively stabilized and reduced.

Studies on the use of vegetable oil in T Area began in 2006. By using the biodegradable oil, zones are created that serve to decrease chemical concentrations. This is done by physically isolating the contaminants in the oil, reducing groundwater mobility. The vegetable oil also encourages microbes to grow and more efficiently aid in the breakdown of chemicals. In-place degradation is typically more efficient and cost effective than physically removing the contamination through pump-and-treat methods.

Brian Looney, Miles Denham and Kitt Bagwell also contributed to this research.

SRNS thinks 'green' while saving 'green'

After successfully remediating two contaminated areas in P Area, energy efficient soil vapor extraction (SVE) systems are being relocated to support continuing M Area cleanup.

In February 1954, the SRS P Reactor commenced production of weapons grade plutonium for our nation's defense. In 1988, after 34 years of operations, the reactor was placed in warm standby and eventually shut down in 1991, leaving a long legacy of service to the nation, and plenty of cleanup to be done.

Following the shutdown, investigations performed by Environmental Compliance and Area Completion Projects (EC&ACP) identified two soil contamination areas with volatile organic compounds (VOCs). Working with both the South Carolina Department of Health and Environmental Control and the Environmental Protection Agency, soil vapor extraction was selected as the primary remedial technology to treat these contaminated areas.

Soil vapor extraction works by "vacuuming" the subsurface to remove contaminants locked within the soil. Shallow wells were installed and equipped with SRNL-patented MicroBlowers™, small pumps that withdraw contaminated VOC vapors from the soil. The microblowers are powered by a solar panel during the day and a solar recharged battery at night.

After two years of operation, the regulatory agencies have agreed that cleanup is complete and the cleanup equipment could be dismantled.



Photo: Soil vapor extraction units in P Area

"The Soil Vapor Extraction system in P Area has been tremendously successful at VOC removal," said Chris Bergren, EC&ACP acting director. "We have identified other VOC contamination areas to redeploy the system to minimize costs associated with our environmental cleanup scope. Not only are we successful in completing cleanup of legacy contamination, but we are able to identify cost effective redeployment opportunities, providing us a win-win for the environment and pocketbook."

The P Area above-ground remediation systems are now being dismantled and will be used on VOC contamination cleanup on another EC&ACP cleanup project in M Area. Reuse of proven remediation equipment promotes SRS's commitment to cost effectively address legacy contamination.

SRNL's Brinkman speaks at monthly Science Café in Columbia

SRNL's Dr. Kyle Brinkman was a participating speaker July 9 in a Columbia, S.C., event called the "Science Café," billed as "the only place in South Carolina where for the price of a cup of coffee, a quality craft beer or a smooth glass of wine, anyone can come to explore the latest trends in science and technology."

The event, sponsored by EngenuitySC, is held the second Tuesday of each month at Delaney's on 711 Saluda Avenue in Columbia. Science Café is an opportunity for science enthusiasts to network, and to have an open discussion about current scientific issues, research and applications.

Brinkman appeared with Dr. Kenneth Reifsnider, Director of the Solid Oxide Fuel Center at the University of South Carolina, a world leader in solid oxide fuel cell and energy system research and an SRNL partner. They spoke and answered questions on the fuel cell environment in South Carolina and the role that materials play in energy technologies.

Brinkman is Program Manager for SRNL's Energy Efficiency and Renewable Energy activities. He also serves as an Adjunct Professor at USC in the Department of Mechanical Engineering's Solid Oxide Fuel Cell Center of Excellence.

The Science Café opens with a networking opportunity at 5:30 p.m., followed by the discussion at 6 p.m. The public is invited, and the event is free of charge.

For more information, go to <http://engenuitysc.com/sciencecafe>.



Dr. Kyle Brinkman



SRNS Scenes

Lespedeza hirta, or hairy bush clover, is an indigenous species to the Savannah River Site, and was photographed near Tinker Creek at the Site. (Photograph by Steve Ashe)

In the world of business, our business is

safety and security.



Watching out for ourselves.

Watching out for our coworkers.

Focusing on safe and secure performance
from complex jobs to routine tasks.

A world-class safety and security culture
to support local, regional and national
business opportunities.

Savannah River Nuclear Solutions.
Safety and security in action.



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