DECEMBER 2016

SAVANNAH RIVER NUCLEAR SOLUTIONS

SRNS Today

The art of technology

SRNL's Chandra Babbitt fuses creativity with precision in scientific glassblowing

This month

Saving taxpayer dollars • Delivering 'Toys for Tots' • Racing for bikes • Innovation at work

Stuart MacVean
SRNS President and CEO

Welcome

to the December 2016 edition of

SRNS Today

Teamwork. It's good for business and good for our community.

When we work together, we accomplish more. It's true in our operations here at the Savannah River Site, and also true in our support of our local communities.

In this edition of SRNS Today, you'll see teamwork in action in improvements to our HB Line plutonium disposition operations. Our scientists and engineers collaborated to replace aging colorimeters (devices that help determine the concentration of plutonium in solutions) with modern devices called "spectrophotometers." In addition to improved measurement capabilities, the new spectrophotometers can be calibrated in a matter of minutes and offer flexibility for future applications. Please see the story on Page 6.

This month, our teamwork with the community is evidenced through the annual Toys for Tots campaign. Through the annual "Dash for Bikes, Walk for Trikes," friendly competition raises funds for hundreds of bicycles and tricycles. Employees also collect toys and make donations that will help hundreds of local children to have a brighter Christmas this year.

In 2017, we'll continue to bring you news of our continuing accomplishments here at SRS, accomplishments that provide solutions to our country's most critical goals and issues.

I hope you enjoy this edition of "SRNS Today." As always, thank you for your interest in Savannah River Nuclear Solutions. May your holidays be bright and your New Year safe, happy and prosperous.

Savannah River
NUCLEAR SOLUTIONS℠
FLUOR • NEWPORT NEWS NUCLEAR • HONEYWELL

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 personnel assist SRSCRO employees transfer oil from spare electrical power transformers at SRS to a tanker truck.

Surplus equals savings

SRNS, SRSCRO partnership results in $7 million in cost avoidance

What does SRS do with outdated or unneeded materials, supplies, machinery and equipment? They often work with the SRS Community Reuse Organization (SRSCRO) and to date, this partnership has resulted in approximately $7 million in calculated cost avoidance for DOE.

The SRSCRO is a private, non-profit organization charged with developing and implementing a comprehensive strategy to diversify the economy of a five-county region consisting of Aiken, Allendale and Barnwell counties in South Carolina and Richmond (Augusta) and Columbia counties in Georgia.

Often, the ownership of surplus items at SRS are transferred to the SRSCRO and sold for their value as scrap materials or sold "as is" to be reused by other companies. Businesses and industry across the region and elsewhere benefit from the used equipment, materials or proceeds obtained from each SRSCRO transaction and, in the process, create new jobs for area residents.

"Simply put, the sale of these excess assets are used for our regional economic and workforce related programs, which in turn, empowers and fuels local economies," said Rick McLeod, Executive Director, SRSCRO. "Items of value originally paid for by taxpayer dollars are being reutilized to benefit the entire region."

McLeod explained that the SRSCRO is especially interested in creating an environment attractive to technology-based startups, business expansions and new ventures.

"We've had some pretty interesting acquisitions from SRS over the years including a fire engine, a locomotive and over 10 miles of railroad track," said McLeod.

SRNS is continuing to work with McLeod on the "assets for services" program to remove and dispose of dozens of aged trailers formerly used as temporary offices at SRS. This program involves SRSCRO removing the trailers at no cost to U.S. taxpayers and in return receiving assets such as transformers from a now closed power plant within the site's D Area.

Normal disposal costs for a single trailer at SRS have been as high as $45,000 over recent years. "The time and manpower needed to safely and efficiently remove utilities, uninstall support infrastructure, demolish and transport a trailer to a landfill is costly," said Andy Albenesius, SRNS Site Services Program Manager. To date, SRSCRO has either demolished or removed 22 trailers with another 16 in the queue for early 2017.

More recently, partnering with SRNS and the SRSCRO, DOE donated two large metal platforms to the Aiken Department of Public Safety (ADPS) training program.

"The platforms obtained from DOE through SRNS and the SRSCRO are a highly valued addition to our extensive training program," said Captain Brian Brazier, Fire Division, ADPS. "They will help ensure we are fully prepared to aid those in need when a rescue occurs involving a confined space."

Art meets technology

SRNL's Chandra Babbitt fuses creativity with precision in scientific glassblowing

> In scientific glassblowing, there can be no flaws. Someone is depending on you to make it right.
>
> **Chandra Babbitt**

The Savannah River National Laboratory (SRNL) recently hired the first female scientific glassblower at SRS, supporting a specialized group at the lab that creates custom glassware for experiments and other scientific uses.

Third-generation glassblower Chandra Babbitt, who describes her craft as "science mixed with glass and technology," has been immersed in the art of glassblowing her entire life; however, Babbitt hopes her new position at SRNL shines light on scientific glassblowing rather than the more widely-recognized creative side of the art form.

"Glassblowing is a skill that has to be perfect. In scientific glassblowing, there can be no flaws," she said. "Someone is depending on you to make it right."

A Kentucky native, Babbitt grew up attending American Scientific Glass Society meetings with her family, and her love for art and chemistry led her to pursue a career in scientific glass technology. While attending Salem Community College in Penns Grove, N.J., Babbitt learned about best safety practices, glass properties and innovative strategies for meeting her future customers' needs.

Babbit said she is proud to be the first female glassblower at SRNL. "As more women become interested in glassblowing, I'm confident the number of female scientific glassblowers will continue to grow," Babbitt added.

As a scientific glassblower at SRNL's Glass Apparatus Laboratory (GAL), Babbitt creates custom glassware for the laboratory setting, collaborating with other SRNL personnel to help solve customers' challenges and ensure the end products suit the needs of the laboratory. Since the glassware Babbitt crafts is unique, there are limited existing instructions she can use as a guide.

Established in 1953 at SRS, the glass lab provides a number of services for its customers including designing, fabricating and repairing glass apparatus. It has been a major component in a number of projects for H and F Canyons, in academic partnerships with the University of South Carolina and Clemson University, and with other DOE entities.

Currently, the glass lab is creating small mockups for the Defense Waste Processing Facility (DWPF). These mockups created by Babbitt and her co-worker Gary Dobos, a 23-year GAL veteran, provide a safe and cost-effective method for DWPF personnel to process high-activity waste in borosilicate glass, a stable storage form.

"Everyone here has been very friendly and kind to me," said Babbitt. "I also enjoy the area. There are many things to do around here. I can easily go hiking, kayaking, biking or go to the beach. Also, I'm now much closer to my family. All in all, it seems like the perfect next step in my life."

SRS employees gather toys by the truckload for area kids in need

SRS employees have once again celebrated the tradition of collecting toys by the truckload, partnering with the Marine Corps Reserve's Toys for Tots and the Salvation Army's Angel Tree program to benefit less fortunate children in the Central Savannah River Area during Christmas.

U.S. Marine Corps Staff Sgt. Gregory Allen (right) accepts a check from SRNS President and CEO Stuart MacVean.

The generosity of SRS employees was proven with the collection of more than 12,000 toys for this year's drive. Since 1991, more than 375,000 toys have been collected for the cause. In addition, SRNS and other contractors provided corporate monetary gifts to further add to the success of this year's program.

"This is the largest collection of toys I've been a part of since joining the Marine Corps in 1981," said Staff Sergeant Gregory Allen, U.S. Marine Corps. "SRS takes a lot of pressure off us. We don't have to gather and organize the toys. They're here, accepted and ready to go. All of this is inspiring."

Construction employees also sponsored the Salvation Army's Angel Tree program, enabling SRS employees to assist 730 area children.

"Dash for Bikes, Walk for Trikes" On Dec. 1, dozens of contractor employees at SRS combined fun with athletic competition in the sixth annual "Dash for Bikes, Walk for Trikes" relay race to raise thousands of dollars for the SRS Toys for Tots campaign. Event coordinator and SRNS engineer Mary Baird said, "Over the years we've developed a fun tradition where each team wears some kind of costume," said Baird. "We're always amazed with their high level of enthusiasm and inspiring creativity." To date, more than $35,000 has been donated through this annual event, which was used to purchase over 650 new bicycles and tricycles. Proceeds from last year's race alone enabled the procurement of about 200 new bicycles and tricycles.

Innovation at work

Improved instrumentation leads to more efficient operations in SRS's HB Line

SRNL scientists and engineers have teamed with SRS HB Line to develop an improved version of chemical measurement instrumentation and replace a less efficient and aging process monitoring system in the Site's mission to disposition surplus plutonium.

Since the late 1990s, SRS's HB Line used instruments called colorimeters to determine the concentration of plutonium in solutions at key locations by measuring the shade of the solution. A darker solution generally indicates more plutonium is present. HB Line engineers use the results to track the progress of the work and to maintain strict safety standards that limit the plutonium concentration held in and transferred to different tanks along the process.

"However, the colorimeters were problematic," said Rob Lascola, Fellow Scientist in SRNL's Analytical Development Section (ADS). "They took too long to troubleshoot, calibrate and repair, and were not as accurate as HB Line personnel needed. The uncertainty of the measurements meant that plutonium concentrations had to be kept very low to ensure that they were within safety limits. Processing efficiency was impacted as a result."

To address these issues, Lascola and Pat O'Rourke, Advisory Scientist in SRNL/ADS, came up with a way to take commercially available spectrophotometers and use them in place of the colorimeters.

"Spectrophotometers can see a broader range of colors, making their measurement of plutonium more accurate," said O'Rourke. "The colorimeters also had to be removed from the facility and taken to SRNL yearly for calibration. Our spectrophotometers can be calibrated in place and in a matter of minutes."

Spectrophotometers are used in a number of industries to monitor chemical manufacturing processes, including pharmaceuticals, pulp/paper and food. They are used to measure/assure product quality to ensure safety and to speed operations. To make the spectrophotometers work in HB Line, Lascola and O'Rourke modified their design to make them more accurate, reliable and easier to maintain, and also developed mathematical formulas to convert the color absorption patterns measured by the instrument into plutonium readings.

HB Line Engineer Chris Loyal performs process monitoring using a spectrophotometer, a newly-installed and improved version of chemical measurement instrumentation.

Once the scientists determined the science needed to make the spectrophotometers fit the plutonium mission needs, they partnered with SRNL Research and Design Engineers Jean Plummer and David Immel to create the hardware and control software.

"We called it the 'next generation spectrophotometer' (NGS) for a couple of reasons. One reason was that this system uses spectrophotometers in an enhanced implementation, providing better measurements and facilitating ease of instrument calibration and maintenance," said Plummer. "It's a next generation forward-thinking implementation of spectrophotometers."

Immel and Plummer designed the NGS to fit into a cabinet that is located in the Operations Control Room in HB Line. Although complicated computer models with precise calculations can be found behind the scenes, the engineers designed the front screen to be user friendly for operators. Additionally, the NGS system is connected to the HB Line computerized system called the Distributed Control System (DCS), providing input into process valve decisions and alerting operators to any NGS alarm conditions at the DCS console.

"The NGS can also be used in other areas of the DOE complex, including other areas here at SRS," said Immel. "The NGS was designed so that new models developed by the scientists to measure concentrations of other material species, such as uranium, could be loaded into the current system without modification to the NGS hardware and software."

Once the design was fabricated and tested at the lab, HB Line Engineering then performed necessary design/safety basis authorizations to facilitate its installation as well as its performance testing in the field. The NGS was installed in September and processing has resumed using the new instruments.

The project took more than two years to complete and is expected to provide substantial cost savings and reduced downtime during future production.

Jackson Middle School students (from left) Brianna Gray, Nicholas Jackson, Jahir Bautista-Garcia and Trinity Freeman, and JMS STEM Coordinator Kishni Neville, learn how nesting is created for endangered birds from Jennie Haskell, USDA Forest Service-SR.

Jackson students study SRS habitat for endangered woodpecker species

Fifty-nine middle school students from Jackson, S.C., recently visited SRS to experience how the habitats for endangered species are being protected and created on the 310 mile reservation.

"What normally takes a red-cockaded woodpecker years to create within the trunk of a longleaf pine tree is artificially created by cutting a rectangular hole and inserting a prefabricated wooden box that simulates a natural cavity within the tree," said SRNS Education Outreach Coordinator Kim Mitchell.

The Jackson Middle School (JMS) field trip to SRS was part of a new Project Based Learning (PBL) program initiated through a partnership between SRNS and the Ruth Patrick Science Education Center, which involves the USDA Forest Service-Savannah River. The program offers schools like JMS, the first accredited STEM (science, technology, engineering and math) magnet middle school in Aiken County, an in-depth study concerning endangered species.

The PBL project focused on an intensive study of the red-cockaded woodpecker and the Bachman's sparrow, two birds of concern in the Southeast due to loss of habitat. The students were immersed in a study of these birds and the habitat best suited for their survival at SRS.

The field trip began with a hike through the forest to reach a recently installed woodpecker insert. Jennie Haskell, a USDA Forest Service-Savannah River Forester, discussed the technique used to install an insert.

"This SRNS STEP (Science and Technology Enrichment Program) class is exactly what we're looking for as part of our PBL pilot program," said Kishni Neville, JMS STEM Coordinator. "It's hands-on learning that's been proven to be highly effective."

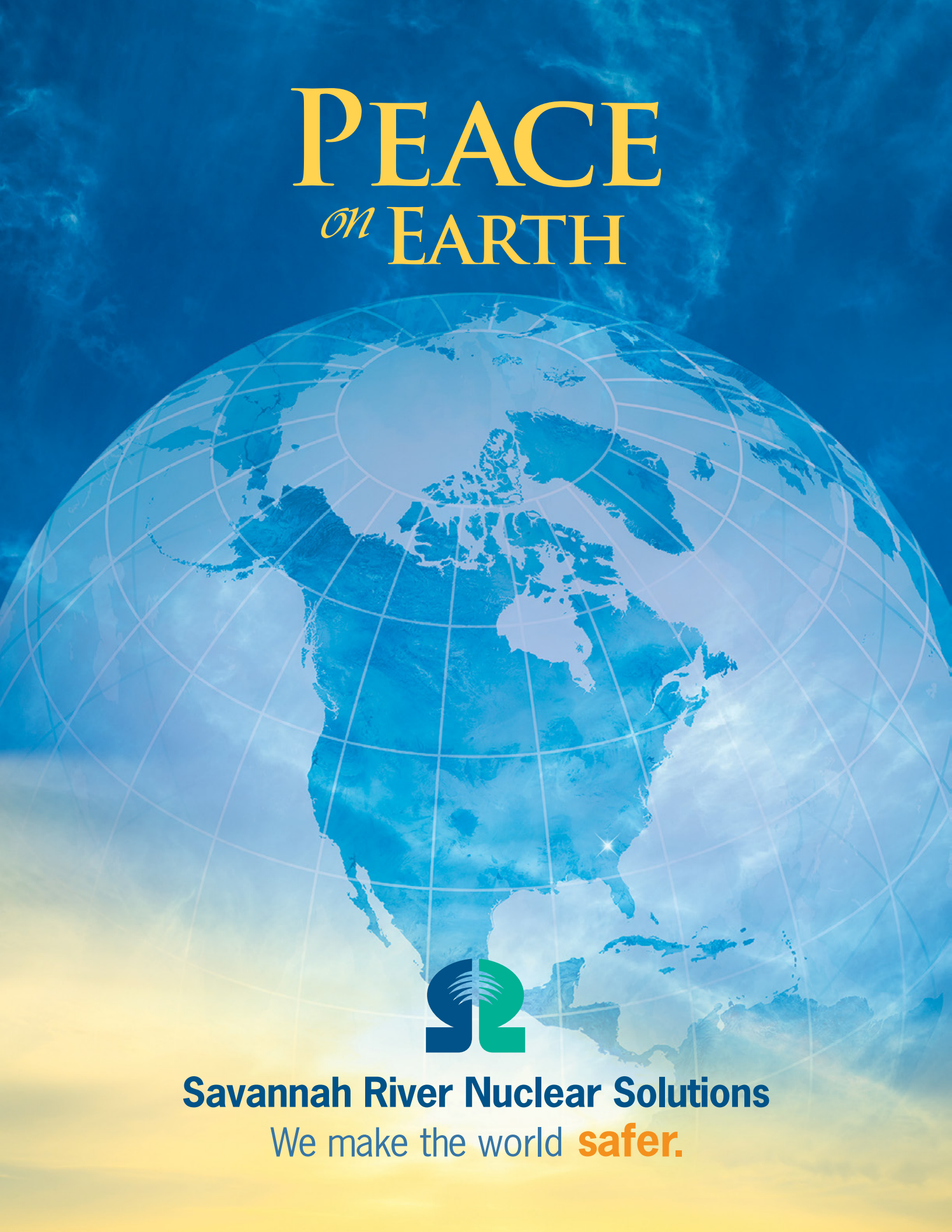
According to Haskell, environmental education builds a foundation in children, helping them to recognize the impact humans have on plants and animals, and the potential for extinction if endangered species are not protected. "Thankfully, striving to create an expanded living environment for the red-cockaded woodpeckers has paid off," said Haskell. "In 1986 there were three birds at SRS. Now we estimate a population of about 86 family groups."

Stuart MacVean, SRNS President and CEO, (left) escorts S.C. Lt. Governor McMaster to the Plutonium Blend Down Mock-up in K Area.

S.C. Lt. Governor McMaster tours Savannah River Site

Lieutenant Governor Henry McMaster visited SRS on Nov. 29 to gain a greater understanding of SRS operations and missions. In addition to other facilities, Lt. Governor McMaster and his Chief Legal Council, Andy Fiffick, visited the Plutonium Blend-down Mock-up in K Area along with SRNS President and CEO Stuart MacVean, and SRS Manager Jack Craig. Allen Gunter, Senior Technical Advisor to the Assistant Manager for Nuclear Materials Stabilization, and Janice Lawson, Nuclear Materials Storage and Spent Fuel Project Manager, provided an in-depth overview of the mock-up.

Allen Gunter explains the blend-down process to S.C. Lt. Governor Henry McMaster.


PEACE
on EARTH
Savannah River Nuclear Solutions
We make the world safer.