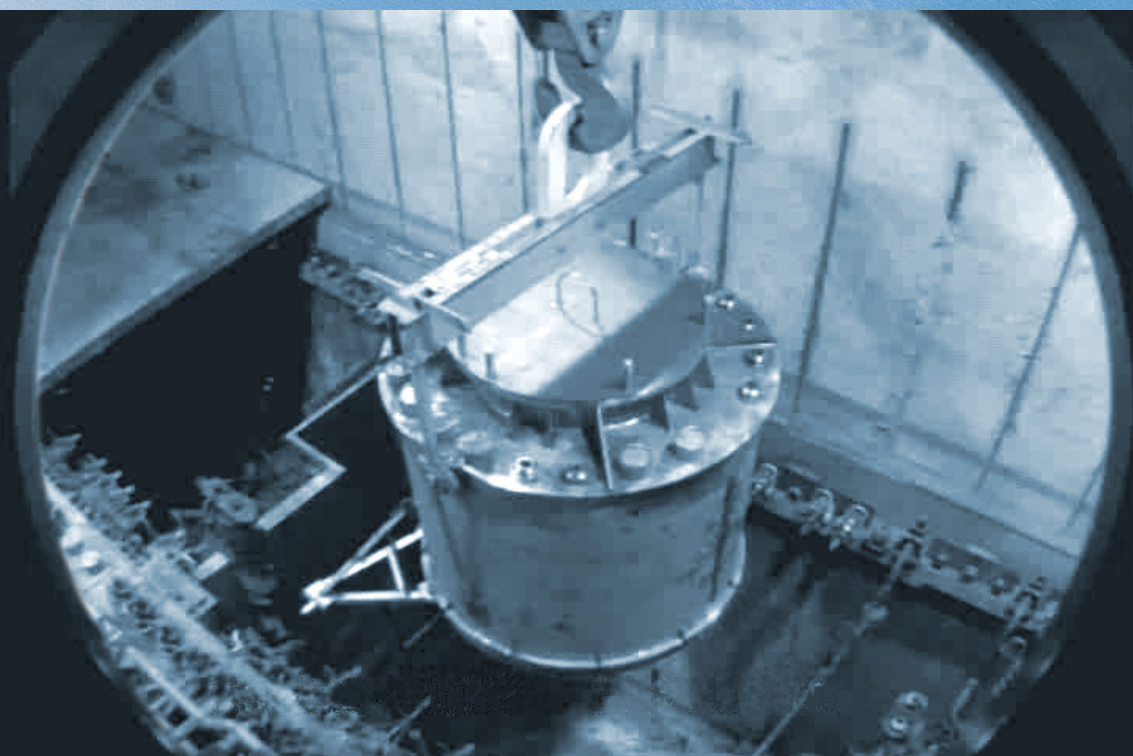


● JANUARY 2018

SAVANNAH RIVER NUCLEAR SOLUTIONS



SRNS Today



Dissolver replaced

New capability increases H Canyon flexibility for new missions

This month

2018 safety campaign • Solar technology licensing • Video award • Future City





Stuart MacVean
SRNS President and CEO

Welcome

to the January 2018 edition of

SRNS Today

January was a month filled with unexpected distractions for our employees at SRNS. A rare instance of winter weather led to icy roads, delayed school start times and an afternoon of flurries; flu season has arrived in full force; and the brief government shut-down caused employees some uncertainty. Yet, through it all, SRNS continued to set the standard for excellent work done in a timely and safe manner.

In H Canyon, operations employees recently replaced one dissolver and reconfigured another, which will allow us to process two different types of fuel at the same time. This helps reduce costs and helps make the world safer.

We again emphasized our commitment to STEM education and the future workforce in January. We provided a tour of the Savannah River Site to nearly 30 career counselors and specialists from Aiken County Public Schools; Information Technology employees recently participated in a program seeking to introduce students to computer programming; we coordinated and hosted the Regional Future City competition for middle school students; and Savannah River National Laboratory nuclear materials expert and Embassy Science Fellow at the U.S. Embassy in Tokyo Fellow Kerry Dunn took time out of her schedule to visit an all-girl senior high school to discuss the opportunities available in the nuclear industry.

This month, we also began our 2018 workforce safety campaign, "Safety and Security Begin with Me... Because of them." Through banners and video, this campaign showcases employees and their loved ones, and reminds us to return home in the same way we arrive at work.

2018 is off to a great start!

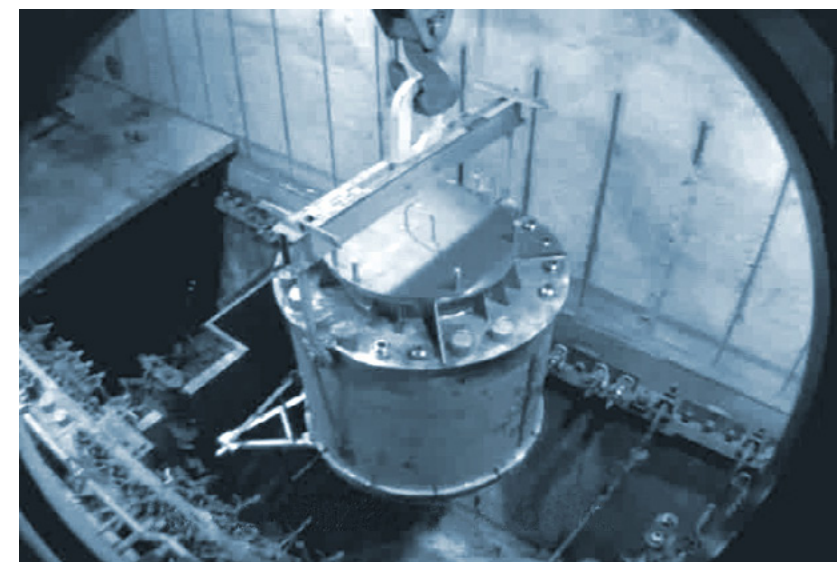


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Savannah River Nuclear Solutions, LLC, is a Fluor-led company whose members are Fluor Federal Services, Newport News Nuclear and Honeywell. Since August 2008, SRNS has been the management and operating contractor for the Savannah River Site, a Department 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 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



PHOTOS

Left: Using a remote-control crane, operators lower a new dissolver into place in H Canyon. The dissolver is part of a set that will be used to process two different types of spent nuclear fuel at a time.

Below: The new dissolver has been completely lowered into place. Crane operators will finish all installation work remotely.

Dissolver replaced

H Canyon flexibility allows dissolver replacement, new mission

Employees in the SRS H Canyon recently replaced one of the facility's two dissolvers for the first time in a decade, allowing the facility to perform its vital national security mission even faster.

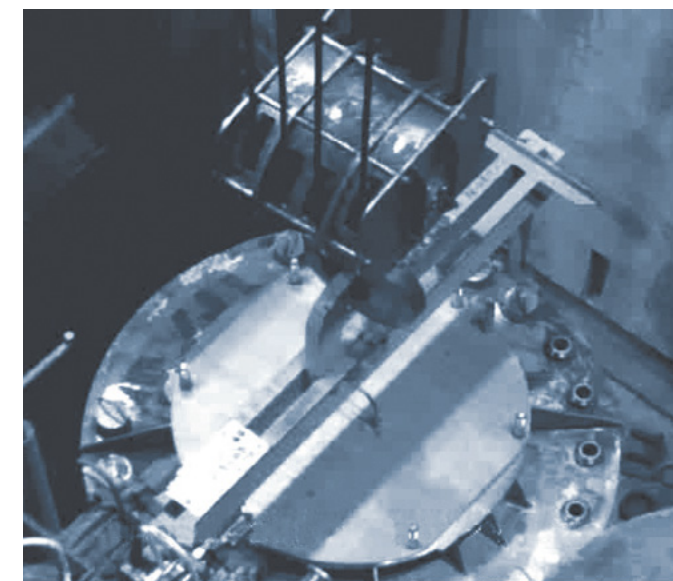
H Canyon's mission is to blend down highly enriched uranium (HEU) spent nuclear fuel (SNF) from domestic and foreign research reactor fuel into low enriched uranium (LEU). LEU can be used to make fuel for commercial power reactors and is also less attractive to terrorists than HEU.

The first step of the chemical processing that turns the HEU SNF into LEU, dissolving the fuel, is done in large stainless-steel tanks called dissolvers. The Department of Energy (DOE) recently assigned H Canyon the mission to dissolve High Flux Isotope Reactor (HFIR) cores, which are shorter and have a larger circumference than Material Test Reactor fuel, which H Canyon's two existing dissolvers were designed to accommodate.

"This new mission required us to replace one of the dissolvers and reconfigure the other one to accept HFIR," DOE Nuclear Materials Manager Maxcine Maxted said. "Being able to use two dissolvers for two different types of SNF will allow us to process material more quickly and more efficiently utilize H Canyon. This reduces liability for the government, reduces long term costs and helps make the world safer."

Most maintenance and processing activities in the canyon are done using remote control cranes to protect workers from radiation. Highly skilled crane operators can do all needed work using a series of video cameras and crane controls from a crane control room.

"This is the first time we have had to replace a dissolver since 2008," said Maxted. "Many of our crane operators had never seen this done with the cranes, so they got to learn how to perform the operation safely and efficiently."



The new dissolver took two years to fabricate by an off-site vendor. Once at SRS, it took a team of employees from Quality Assurance, Engineering, Operations, construction, transportation, SRNL and start-up testing to ensure the dissolver was safe and ready to be placed into the canyon.

H Canyon is the only operating, production-scale, radiologically shielded chemical separations facility in the U.S. Uranium is recovered from SNF rods through a complex chemical process, in which fuels are dissolved and run through solvent extraction cycles that remove impurities that are present in the fuel. The uranium is then mixed with natural uranium in a process called "blend down," and is loaded in shipping containers for shipment off site.

the technical side of safety

SRNS Technical Services holds annual kick-off to focus on safety

SRNS Technical Services (TS) held their annual Safety Kickoff Jan. 17-18 in the 766-H training building. This year's attendees topped over 800 employees, representing different organizations within Technical Services, as well as employees from other site divisions, making this truly a site experience.

The TS Safety Kickoff has grown from a department's simple emphasis on returning to work safely to the current program, which includes games, demonstrations and employee activities which emphasize the SRS safety culture and enable knowledge transfer to reach a broad audience.

Each of the 10 Local Safety Improvement Teams (LSITs) from TS were represented at this year's event, which focused on "BBS+." The concept of BBS+ is to look at the whole job and all the aspects used to ensure a job is performed safely. These may include looking at lessons learned, conduct of operations, training, security

and environmental compliance. These factors, along with the BBS focus on industrial safety, have become an integral part of the SRNS safety culture. Each LSIT created an event to showcase and highlight BBS+.

A highlight of the kickoff was a preview of the ability for site phone users to log in BBS+ observations via their site-issued iPhones. This will provide a user-friendly method to perform BBS observations while in the field.

"The feedback for this event was very positive and I attribute this directly to the LSIT folks," said Geoff Reynolds, Director of Site Services. "I also want to give a shout-out to all the LSIT Chairs for supporting the year-long planning for this event."

Photo: The Business Management Lions LSIT hosted a "Safety Feud" gameshow at the annual Technical Services Safety Kickoff. Participants were challenged on BBS+ and the SRNS Standard of Excellence.

K Area using innovative scenario-based training

K Area at SRS has recently begun using an innovative approach to ensure that employees understand their role in recognizing and responding to abnormal conditions.

Called "scenario-based" training, this new technique presents employees with scenarios involving situations where personnel encounter unexpected equipment operations or deviations from procedures. The training is executed in the field and the operations personnel participating are expected to respond and to simulate equipment operation and notifications to management or appropriate parties according to protocol.

"These scenarios allow management to judge personnel responses while also allowing us to correct weaknesses, enforce expectations, improve efficiency and update procedures as needed," said K Area Facility Manager Janice Lawson. "We first performed unannounced coached scenarios to determine the initial state of the shifts. Once we provided feedback, we allotted time for the shifts to work on their identified improvement items. We are now in the process of performing a different graded scenario on each shift. We have seen significant improvements between the coached and graded scenarios."

"Everyone learns from the drills because they get us involved with response procedures and problem solving as a team in ways we don't experience on a daily basis," said K Area Shift Manager Stephen

Weeks who has participated in two drills. "The drills are intensive but are well written and force the team to work their way through the issue. Since there is no way for facility procedures to cover all possible conditions, the scenarios are written so you have to use your system knowledge along with procedures to diagnose the problem."

"We have presented two different scenarios so far, one involving an unexpected reading on a pressure indicator, and one involving a degraded piece of equipment," said Lawson. "In both scenarios, we went through each step from the moment the anomalies were discovered, through shift turnovers and then through repair and return of the equipment to service. As the program matures, we will present more scenarios."

Lawson said that it was important to simulate shift turnovers in the training because employees need to ensure proper communications between shifts. This reinforces proper communication and documentation of the facility status, abnormal or limiting conditions, and any potential future actions needed.

"This new approach to training is an innovative way to ensure personnel are reacting to unexpected events in the safest and most efficient way possible," said DOE Nuclear Materials Manager Maxcine Maxted. "It's something that we hope to adopt in other areas around SRS."

Solar System

SRNL, United Sun Systems announce new license agreement

Savannah River National Laboratory has licensed its high-performance metal hydride-based thermal energy storage technology for concentrating solar power to United Sun Systems (USS), a small solar technology company.

This thermal energy storage technology intensifies the storage of heat by more than 10 times compared to latent and sensible heat storage technologies. The improved performance of the system is due to the use of metal-hydride materials—chemical compounds containing a metal such as aluminum that are bonded to hydrogen—that efficiently store heat in chemical bonds. Researchers at SRNL developed this approach because hydride materials offer very dense sources to store thermal energy while being inexpensive and rechargeable without degradation in storage capacity. These hydrides are similar to the materials that can be used in fuel cells to store and release hydrogen.

"By using our unique expertise, we have been able to develop an inexpensive way to store solar energy that makes this renewable energy source cost competitive with fossil fuels," said Dr. Terry A. Michalske, SRNS Executive Vice President and SRNL Director. "We are pleased to be partnering with USS and sharing our innovation with the solar industry."

"Prior to the discovery of this class of hydride materials, storing heat at this temperature was only possible using expensive and highly corrosive materials," said Dr. Ragaiy Zidan, SRNL Advisory Scientist and inventor of the technology. "This is a game-changing technology for the concentrated solar power sector that will drastically reduce its cost and improve its performance."

The development of the metal hydride thermal energy storage system was supported by a research award from the DOE Solar Energy Technologies Office under its Concentrating Solar Power (CSP) subprogram, which focuses on lowering the cost of CSP technologies through research and development.

USS plans to use this technology as a "solar battery" solution for large scale solar energy production. The new system will be industrialized and commercialized in a few years to produce and distribute electricity around the clock at prices that are expected to be up to 95 percent less expensive than current photovoltaic systems that use lithium-ion batteries and competitive with fossil fuels.

"This partnership will allow us to deploy large-scale solar energy production that will revolutionize the industry," said Lars Jacobsson,



SRNS Executive Vice President and SRNL Director Dr. Terry A. Michalske (left) and USS CEO Lars Jacobsson sign an exclusive licensing agreement allowing USS to use a metal hydride-based thermal energy storage technology for concentrating solar power created by SRNL in its products.

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"This partnership will allow us to deploy large-scale solar energy production that will revolutionize the industry. With this technology we will create more than 2,500 manufacturing jobs in the U.S. during the first five years of system production with many more jobs created through energy production."

Lars Jacobsson

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Chief Executive Officer, USS. "With this technology we will create more than 2,500 manufacturing jobs in the U.S. during the first five years of system production with many more jobs created through energy production."

The USS solar energy technology is based on a concentrated solar thermal power dish, a 14-meter diameter parabolic dish covered with glass mirrors, that focuses the solar rays to create temperatures of 750 degrees Celsius. This energy will be stored in the company's new thermal battery. The battery powers a heat engine—in this case a Stirling Engine—that creates electricity through a generator. The system will be a gas hybrid and as a result is able to guarantee electricity production during longer periods of solar generation interruptions. The system is scalable from one unit, which can generate power for up to 11 homes.

USS International is a Swedish and UK based company with an American subsidiary acting out of The Nordic Innovation House in Palo Alto, Calif. USS was formed in 2010 with the ambition to supply the global market with the most optimal CSP Dish-Stirling solution. USS and its associates have been involved in the creation and development of more than 80 percent of all CSP Dish-Stirling projects since the 1970s.



...Because of them

2018 safety campaign showcases employees and their loved ones

SRS has revealed its 2018 workforce safety campaign with an important message about the most valuable reason to embrace a strong workplace safety culture.

The banners, which span the Site's cloverleaf overpass and barricades, showcase the loved ones of several SRS employees with the message, "Safety and Security Begin with Me... Because of them."

SRS has a longstanding legacy – dating back 67 years – of on-and-off the job safety. For SRS employees, safety is the common bond that links the diverse scopes of work that are steeped in environmental cleanup, innovative technology, energy independence and national security.

"As SRS continues to serve our nation through the generations, we routinely hire new employees who are picking up the batons of the generations that came before them. It is important to us to indoctrinate our newest members into our safety culture, which our workforce is incredibly proud of," said Jack Craig, DOE Site Manager.

Craig continued, "The 2018 SRS safety campaign speaks to the heart of the importance of workplace safety, which should be applied in every job whether at work, or at home. We all have a reason to return home in the same condition we left—there is not a more valuable reason for taking safety seriously in everything we do."



"At the heart of everything we do resides an unwavering commitment to our families and community. Our technical capabilities are impressive, but above all, safety is our most important commitment. I am proud of that kind of culture."

Stuart MacVean



With more than 12,000 SRS employees calling the CSRA home, there are exponentially more outside of the barricade who call an employee their friend, family or neighbor.

"When it comes to the vital national work that we accomplish, at the heart of everything we do resides an unwavering commitment to our families and community. Our technical capabilities are impressive, but above all, safety is our most important commitment. I am proud of that kind of culture," said Stuart MacVean, SRNS President and CEO.

To complement the refreshed safety culture banners that have been launched across the Site, a video was produced, which features employees and their families from nearly every SRS contractor. It can be found on YouTube by searching "Savannah River Site" or by going to <https://www.youtube.com/watch?v=BHClQ5r6UmE>.

Future City

Kennedy Middle School team walks away with first place for their model city of tomorrow

Teams of middle school students from across South Carolina and the Aiken-Augusta area arrived at this year's Regional Future City competition to show off intricate table top models that hopefully best represent the most innovative and practical city of the future.

On Jan. 20, a team from Kennedy Middle School in Aiken, S.C., took first place, while a strong finish by Aiken Area Home Educators led to a second-place trophy. Westview Middle School from Greenwood, S.C., came in third.

The first-place team will soon travel to the Future City National Finals in Washington, D.C. In addition, the top prize is \$7,500 for the school's science, technology, engineering and math (STEM), program plus a trip to U.S. Space Camp in Huntsville, Ala.

"Through this program, students learn how today's engineers and city planners deal with citywide sustainability issues like waste management, pollution and lack of adequate mass transit systems," said Future City Regional Coordinator and SRNS employee Kim Mitchell. "They research cutting edge technologies and develop an imaginative and plausible solution that can exist for generations."

The student teams, along with an educator and volunteer mentor, research and design a solution to a city-wide challenge that changes each year. This year's challenge is the "The Age-Friendly City."

Long-held assumptions about aging are being radically redefined. Older adults are living longer, staying in the workforce longer and living independently for longer than ever. This population is also growing and altering society's overall demographics. By 2050, older adults will outnumber children under the age of 14.

"I want to become an engineer," said Kayla Goldschmidt, an eighth grader at Kennedy Middle School. "The competition helped me experience different types of engineering, such as civil and environmental engineering, and the field of architecture as well. The engineering aspects of this project gave me an idea of what that lifestyle would be like."

Since returning to school earlier this fall, 45 student teams have been hard at work on their Future City projects. They join more than 40,000 middle school students from 1,350 schools in 41 U.S. regions around the country, all of whom are engaged in similar regional competitions.



Kayla Goldschmidt (from left), Haven Rasmusson and Peter Gleason of Kennedy Middle School in Aiken celebrate their team's first place win at the Future City competition.

Working closely together, students are first challenged to design a virtual city using SimCity™ software. Next, they research today's public spaces and write an essay about their solutions and city design. And finally, students bring their ideas to life by building a tabletop scale model of their city using recycled materials on a budget of \$100 or less and give a brief presentation about their city to a panel of judges.

Future City has received national attention and acclaim for encouraging middle schoolers nationwide to develop their interest in a STEM-based education. The annual challenge is one of the nation's leading engineering education programs and among the most popular.

"This isn't a weekend project. The learning curve is significant, involving months of planning and hard work," said Mitchell. "The creativity and ingenuity found within each project is impressive. Each team should be proud of their city."

For more information on the Future City competition, visit www.futurecity.org.

Embassy Science Fellow

Kerry Dunn shares career perspectives at girls' school in Japan

As part of her three-month assignment as Embassy Science Fellow at the U.S. Embassy in Tokyo, Japan, SRNL nuclear materials expert Kerry Dunn visited the Mito Daini Senior High School in Ibaraki Prefecture to speak to the all-girl student population on "Career and Perspectives" as part of its Global Cafe. Dunn described her career at SRNL to the students and discussed the importance of an engineering career and the different types of engineering graduate programs and careers available in the nuclear industry.



Principal Engineer Michael Martinez-Rodriguez and Energy Materials Manager Brenda Garcia-Diaz work on the Electrochemical Fluorination Reactor System. This system was used in the LDRD MVP awarded project, which generated the highest return of investment over a five-year period.

SRNL honors project with first MVP award

SRNL has awarded its first-ever Laboratory Directed Research & Development (LDRD) Most Valuable Project (MVP) Award to the "Non-Aqueous Electrochemical Fluorination of Used Nuclear Fuel as an Advanced Separation Process" project led by Brenda Garcia-Diaz.

To be awarded annually, the LDRD MVP award recognizes the SRNL LDRD project that has generated the highest return on investment (ROI) during the previous five-year period.

This project developed SRNL's expertise in molten salt electrochemistry, corrosion in molten salt environments, and electrochemical processing of nuclear materials, which led to an additional \$4 million in funding from the DOE SunShot program for molten salt corrosion characterization.

"SRNL's molten salt expertise is now recognized throughout the DOE complex and our team continues to look for ways to apply the knowledge from this project in new areas," said Garcia-Diaz, who works in the Materials Science and Technology Section. She said the experimental manifold and reactor developed from this program have been an important part of an NA-22 program for uranium hexafluoride isotopic analysis, and SRNL's molten salt electrochemistry expertise has been used to explore novel process

“SRNL's molten salt expertise is now recognized throughout the DOE complex and our team continues to look for ways to apply the knowledge from this project in new areas.”

Brenda Garcia-Diaz

routes for Mark-18A targets and other nuclear materials in L Basin with no defined disposition pathway.

SRNL's LDRD program emphasizes early exploration and exploitation of creative ideas that will enhance the lab's ability to execute current and future mission priorities and to sustain staff excellence. An LDRD ROI scorecard was created to boost the performance of the program and strengthen links to SRNL's strategy and competencies. The ROI scorecard is based on 12 objective measures related to follow-on funding, publications, presentations, intellectual property, new hires, partnerships and awards.



SRNL awards STEM scholarships to Augusta University students

The partnership between SRNL and Augusta University (AU) continues to grow through establishment of science, technology, engineering, and mathematics (STEM) scholarships funded by SRNL for AU students.

At the University Scholars Program Reception on Jan. 9, SRNL and AU awarded scholarships for up to four consecutive semesters to four AU students to further their research in STEM

fields, including physics, mathematics, radiological sciences and cyber security.

"I am really excited by this University Scholars program. It's a tremendous complement to the joint faculty position we achieved last year," said Dr. Terry A. Michalske, SRNS Executive Vice President and Director, SRNL. "It's a great opportunity for us to work together to build the intellectual talent that the region needs."



Cristie Shuford, SRNS Radiation Protection Training Manager, discusses the training qualifications needed for those applying for jobs at SRS related to radiation protection to a large group of career counseling professionals from Aiken County Public Schools.

Aiken County Public School career counselors tour SRS, learn of employment opportunities for students

Nearly 30 career counselors and career specialists from Aiken County (S.C.) Public Schools recently attended a tour of SRS designed to help them answer student questions about careers at the site.

The career counselors visited the SRS training facility and the Salt Waste Processing Facility, and participated in an extensive driving tour featuring SRNL, Savannah River Ecology Laboratory, F Canyon and the Defense Waste Processing Facility.

"You really have to tour the site and get involved in presentations, employment statistics and discussions to begin to grasp just how great the potential is for a career at SRS," said Kimberly Mitchell, SRNS Education Outreach.

Mitchell explained that the first step is to raise local educators' level of knowledge about SRS who then act as conduits to reach area students. "It's not just the careers within nuclear operations, jobs that typically first come to mind," said Mitchell. "We want them to know we have research scientists, mechanics, accountants, electricians, admin professionals, crane operators, lab techs, engineers, HR and computer science professionals."

Last year alone, more than 500 new employees were hired by SRNS, the largest company at SRS. Hiring at a higher than normal level is expected to continue for many years as a large percentage of SRS employees become eligible to retire.

Valuable data provided to touring counselors and specialists included SRNS employees hired last year by career field. "Projecting the hiring of a similar number of employees next year in each type of occupation is realistic," stated Mitchell. "This

is practical information students can use to make an informed decision regarding the expected job market."

During the tour, SRS officials also provided information to ensure the counselors and specialists understood the partnership between SRS companies and local universities and colleges, primarily Aiken Technical College, Augusta Technical College and the University of South Carolina Aiken.

"We have a real need here for graduates of 1- to 2-year degree programs, which includes operators, radiation control specialists, welders, mechanics and other personnel," said Mitchell.

According to Aiken Technical College student Christopher Bruce, Aiken Tech has a great two-year degree within their Radiation Protection and Control Program. "I heard about it when I was deciding what to do with the rest of my life. There's a lot of opportunity for this type of job," he said.

Career specialists are employed at Aiken County's middle schools, while career counselors are found within Aiken County's high schools. Helping the career specialists and counselors assist the students is where the "rubber meets the road," or where the most impact can be obtained for the benefit of the students as well as local industry.

"What I think we all heard today, any of our students have the potential to come out here and have a wonderful career for their families," said Gina Bassford, Coordinator for Counseling and Career Services, Aiken County Public Schools. "It's such an incredible opportunity to have locally. And, for nearby colleges to be in lock-step with SRS, so students can get everything they need locally, is such a special opportunity."

SRNS IT teams with Silver Bluff HS as part of the 'Hour of Code'

SRNS Information Technology (IT) employees recently helped area students decipher the often-perceived mystery of computer programming as a part of National Computer Science Week.

Computer programming is a crucial element of many businesses and industries throughout the Central Savannah River Area," said Kim Mitchell, SRNS Education Outreach. "Most students grow up with little exposure to programming and often look at it as a kind of obscure foreign language."

Working with educators from Silver Bluff High School, SRNS employee volunteers recently took an important step to help correct this misconception. And, they did so with young, enthusiastic IT professionals as role models.

"In order to truly reach these students, we knew it would require an effective conversation about fundamental computer science principles that the students could easily understand, relate to and see the potential 'real world' application in their homes and future workplace," said Bo Birdsong, SRNS IT. "Our success would be measured with their level of acceptance that computer programming could be rewarding and an important aspect of a wide variety of potential careers."

The outreach program started when SRNS was recently invited by DOE's Argonne National Laboratory to join multiple DOE sites to celebrate the international "Hour of Code" Initiative. This initiative elevates awareness of computer science in grades K-12 by encouraging children to spend one hour creating a simple computer program. The hands-on experience often inspires the pursuit of a degree in computer science.

This is the first school year SRNS has participated in a program seeking to open the minds of local students to the advantages of exploring and valuing computer programming.

"The impact on our students was notable," said Debbie Niiya, Business Education & Information Technology teacher at Silver Bluff. "Now they have positive role models to consider and a new goal to work towards. I am grateful for the time spent with our students and the impact on their lives."



SRNS IT employees Jon Gore (left) and Bo Birdsong worked with Silver Bluff High School teacher Debbie Niiya as a part of the international Hour of Code Initiative.



SRNS NOW video honored with Silver CINDY award

SRNS received a Silver Cinema in Industry (CINDY) award during the recent international CINDY Awards Competition. These awards are presented to individuals and groups who have produced digital programming that achieves the highest level of excellence in production value and message effectiveness.

Over 9,140 entries from around the world were judged covering more than 170 subject-matter categories. Programs included websites, videos, mobile apps, podcasts, webinars, commercials, documentaries, films, infomercials and music videos.

"It's gratifying to have our flagship employee communications video program series, SRNS NOW, recognized by our professional peers," said Tom Kotti, Manager, SRNS Communications & Media Services. "It's an epic group effort by a team of highly creative and talented professionals, and we're all honored."

The award was earned for the May 2017 edition of SRNS NOW, a video news magazine designed to keep employees informed regarding SRS safety, security, news and events.

"The CINDY award is a well-deserved professional honor for the organization," said Dawn Haygood, Director, SRNS Corporate Communications. "We are all thrilled to be recognized, and it's a testament to the team's talent and dedication to produce effective visual-based communications products."

To view the award-winning SRNS production, use the following link:

https://www.savannahriversolutions.com/news/releases/nr17_srns-video-award.pdf

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