The Savannah River Site (SRS) is owned by the U.S. Department of Energy. Savannah River Remediation LLC manages and operates the liquid waste mission at SRS.

Savannah River Remediation LLC, Aiken, SC 29808
www.srremediation.com
Savannah River Site, Aiken, SC 29808 • www.srs.gov

Annual REVIEW
SAFETY - 2011 Annual Review

OUR SAVANNAH RIVER REMEDIATION (SRR) GOAL IN SAFETY IS SIMPLY “ZERO INJURIES, ZERO EVENTS, ONE DAY AT A TIME.”

While our work is hazardous, our workers set the bar higher by working millions of hours without an injury that could cause one of them to miss a day of work, which is an extraordinary record by any measure in any industry.

SRR employees have proven that we can and do reach significant performance milestones without injury.

“Zero Injuries, Zero Events, One Day At A Time” is the path SRR will continue to take because striving for safe work performance is simply “the right thing to do.”

SAFETY AWARDS

• DOE VPP Star Recertification
• URS President’s Safety Award
• URS 2010 Safe Project of the Year Award
• URS Pyramid Award for Safety
• South Carolina Chamber of Commerce Commendation of Excellence Award
• South Carolina Department of Labor, licensing and Regulation Certificate of Safety Achievement
• National Safety Council Occupational Excellence Achievement Award for SRR Operations
• National Safety Council Occupational Excellence Achievement Award for SRR Construction
• National Safety Council Million Hour Award
• Number 2 safest site in DOE complex rankings

SAFETY AWARD

Martin M. Koffel (right), URS President, Chief Executive Officer and Chairman of the Board, greets SRR employee Jack Osbon, DWPF, Control Room Manager. David Pethick (center), Group General Manager, URS Global Management & Operations Services Group, looks on.

IT IS WITH GREAT ENTHUSIASM AND PLEASURE THAT I PROVIDE YOU

THE 2011 SAVANNAH RIVER REMEDIATION
ANNUAL REVIEW.

This is my first annual review as SRR President and Project Manager, and I am pleased to report we had an exceptional year in safety and work performance.

During the year, our operations employees surpassed 7 million hours without a day away from work because of an injury, and construction employees worked over 24 million hours. Our American Recovery and Reinvestment Act (ARRA) employees completed their two-year project working 1.5 million hours without a day away from work due to an injury.

Our mission is simple. We will disposition the legacy waste currently in underground waste tanks at the Savannah River Site (SRS), and then operationally close the tanks, thus eliminating risk to our environment, the public and our workforce.

The state of South Carolina says the high-level waste at Savannah River Site (SRS) represents the single largest environmental risk in the state. We have the best workforce to perform this type of work, and I look forward to working with them for the safe completion of our mission.

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HISTORIC PARTNERSHIP FORMED

The U.S. Department of Energy (DOE) and Savannah River Remediation (SRR) entered into a partnering agreement on February 3, 2011, becoming the first such partnership under the DOE’s initiative to execute partnering agreements with major contractors.

As partners, DOE and SRR will ensure the success of Savannah River Site liquid waste operations by working together on communications, issue resolutions and coordination.

Partnering Goals are:

- Safety of our workers and the environment will always be our core value, and we will aspire to a safety and quality performance goal of zero accidents, incidents, releases and defects.
- We will use the best Innovative and transformational technologies and engineering processes and work practices to deliver the technical objectives of the contract in an optimal way.
- We will reduce cycle time in all that we do so as to accelerate performance, significantly reduce cost, and thereby exceed expectations.
- We will take the time necessary as a team to plan and perform our work in a manner that assures success the first time and minimizes potential rework.

We will execute the contract at the highest level of management efficiency by eliminating non-value activity, avoiding delays, and fully aligning and integrating business and project systems.

We will communicate among ourselves and with our stakeholders with alignment and transparency.

We will act with trust and mitigate conflicts expeditiously, and with the utmost respect.

Our leadership team will work together seamlessly to ensure the well-being of the work force and ensure a culture of excellence is evident throughout the organization.

SRR Center of Excellence at Work:

- Developed and implemented a Configuration Management program at the Integrated Waste Treatment Plant (IWTU) in Idaho
- Provided Human Resource support for IWTU
- Provided Documented Safety Analysis support for Sellafield and Hanford
- Provided Operational Readiness Review assessment support at IWTU and Los Alamos National Laboratory
- Provided Engineering and Radiological Control support for Separations Process Research Unit (SPRU) in New York
- Provided contract transition support at Paducah, KY, and Oak Ridge, TN
- Developed and implemented a Systems Engineering Process at Sellafield
- Provided design review support for Sellafield and the Salt Waste Processing Facility at SRS
- Provided Conduct of Operations support for the Low Level Waste Repository in Drigg, Cumbria UK
- Assisted with contracting support for Sellafield

TAKING NUCLEAR CLEANUP EXPERTISE TO THE WORLD

Savannah River Remediation (SRR) has grown into a Center of Excellence in nuclear cleanup.

Encouraged and sponsored by the U.S. Department of Energy (DOE), SRR developed the Center of Excellence in 2011. The SRR Center of Excellence has been actively sharing high-level nuclear waste policies, procedures, programs, people, equipment, technology and safety to nuclear cleanup sites all over the world, which have proven beneficial to DOE and the Savannah River Site (SRS).

“Because of our experience and expertise, we have become known as the solution center for nuclear cleanup, providing services, information, equipment and people to sites worldwide,” SRR President and Project Manager Dave Olson said. “We have become a vital source of answers for industry and government.”

SRR has provided safety analysis comparison reviews to the Hanford tank farm project to assist in strengthening its safety program, and have shared people to solve technical issues that will assist in cost and schedule savings.

Providing benefits to the DOE and the liquid waste program at SRS, SRR has participated in benchmarking visits and other exchanges of information with projects in the United States and abroad.

At the United Kingdom’s Sellafield site, SRR has provided policy, procedures, programs and people to upgrade the conduct of operations and maintenance, quality assurance and procurement at the Sellafield site. SRR also has hosted benchmarking visits for teams from Sellafield and Hanford that focused on operations and lessons learned.

Both Hanford and Sellafield have nuclear cleanup issues that SRR expertise is working to help resolve.

SRR has been recognized for its creativity in developing technologies that accelerate the mission of closing waste tanks. As part of the Center of Excellence, these technological advancements also are being shared to projects worldwide in an effort to rid the environment of legacy nuclear waste.
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I am proud of our employees’ safety and operational achievements, from taking highly radioactive constituents from the waste tanks and binding them in glass, to taking slightly contaminated salt waste and solidifying it in concrete. Both methods turn a liquid waste into a solid form, keeping it from contaminating the environment.

...Dave Olson, SRR President and Project Manager

- Tank Farm employees transferred over 28 million gallons of liquid waste by successfully executing over 1,500 separate waste transfers.
- Over 3.2 gallons of space in waste tanks was not used thanks to the Site’s three evaporators operations as part of SRR’s waste tank space management.
- SRR has received no Notice of Violation from any State or Federal Regulatory Agency since SRR began operations on July 1, 2009.
- SRR implemented new DWPF sludge processing and waste receipt sampling strategies that have significantly improved throughput capacity.
- SRR’s Cost Savings Initiative should allow DOE to continue to meet Federal Facilities Agreement and Site Treatment Plan regulatory commitments under future funding limitations.
- SRR continued testing an Enhanced Chemical Cleaning technology that will assist in future accelerated tank cleaning and closure activities.
- SRR continued the SRS tradition of posting another exemplary environmental compliance record in 2011, as liquid waste operations continued to result in minimal impact to the off-site public and the surrounding environment.

DEFENSE WASTE PROCESSING FACILITY SCORES RECORD YEAR

Immobilizing some of the most hazardous waste in South Carolina into a solid glass form suitable for safe, long-term storage is a focal point of liquid waste operations at the Savannah River Site (SRS). The Site’s Defense Waste Processing Facility (DWPF) has performed this work safely and in record fashion.

As the largest radioactive waste glassification plant in the nation, DWPF converts liquid nuclear waste stored in SRS waste tanks into glassified waste. By immobilizing the radioactivity in glass, DWPF reduces the risks associated with liquid waste at SRS and is essential in Savannah River Remediation’s (SRR) mission to clean and operationally close the Site’s waste tanks.

At the heart of DWPF operations is the melter, a 65-ton vessel that receives a chemically balanced feed consisting of treated high-level waste mixed with a borosilicate frit and, when heated, forms a molten glass. New “bubbler” technology facilitates the melting process by injecting argon gas bubbles into the melt pool and keeps the molten glass at a more uniform temperature. This process increases the melt rate and allows for higher production of waste-filled canisters.

In 2011, a record 267 canisters were poured during the fiscal year, a 39 percent increase in production over the previous two years. The facility processed an average of 175 pounds of glass per hour during the year compared to an average of 125 pounds per hour the previous two years.

In December 2011, DWPF poured 37 canisters of glassified sludge waste, the most canisters poured in one month in the facility’s 15-year history.

Since DWPF began operations in March 1996, it has poured over 12.6 million pounds of glass and has immobilized 40 million curies of radioactivity.
We do the right thing

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We do the right thing.

Removing salt waste from the Savannah River Site’s gigantic underground waste tanks is a critical component in the U.S. Department of Energy’s (DOE) mission to operationally close its tank farm system and reduce risk. The successful operations of the Site’s Saltstone facilities play an important role in that mission and are vital to Savannah River Remediation (SRR) liquid waste operations.

On October 14, 2011, the Saltstone facilities achieved an impressive achievement toward accomplishing that mission by surpassing 10 million gallons of low level radioactive waste being processed since initiating operations on June 12, 1990.

During 2011, Saltstone marked other historic records in the processing of low level waste. In June, Saltstone processed a record 519,821 gallons during the month, exceeding the previous monthly high that was established in December 2009. During June, a weekly record of processing was achieved when Saltstone processed over 235,000 gallons. In 2011, Saltstone processed nearly 1.5 million gallons.

The inclusion of additional enhancements to the facilities began in December 2011. These enhancements, called Enhanced Low Activity Waste Disposal (ELAWD), are designed to further improve Saltstone’s operational reliability and increase production rates. Once the ELAWD improvements are made, Saltstone will be able to process at the rates required once the Salt Waste Processing Facility becomes operational.

Saltstone is the only facility in the DOE complex that processes low level waste generated from the treatment of the salt waste from waste tanks. It has proven its effectiveness in safely stabilizing and disposing of the Site’s waste, not only in 2011, but for decades. This excellence in performance will continue until all the Site’s waste tanks are cleaned and operationally closed and the risk to human health and the environment is, like the legacy waste itself, a thing of the past.

Approximately 2.5 million gallons of salt waste have been processed through the ISDP.

The ISDP is a waste disposition system designed to remove nearly all radioactivity from salt waste solutions stored in the Site’s tank farms. It is referred to as “interim” because it was created to operate while the Site’s Salt Waste Processing Facility (SWPF) is being constructed. The ISDP processes one million gallons of waste annually, while the SWPF is designed to process six million gallons a year, which will result in the accelerated cleaning and operational closure of the Site’s waste tanks.

The success of the ISDP continues to demonstrate the viability and robustness of this “first-of-a-kind” process technology and will continue to validate its processes and making improvements to extend operations until the SWPF becomes operational, which is scheduled for October 2014.

Significant enhancements and improvements were made to Saltstone in 2011 that resulted in the record performances and allowed the facility to run more efficiently. These improvements included enhanced process monitoring and refinement to the facilities’ operating procedures.
We do the right thing

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TANK CLEANING, CLOSURE PROCESS MAKES SIGNIFICANT GAINS

The mission is clear. Savannah River Remediation (SRR) will operationally close Savannah River Site’s (SRS) underground waste tanks. The process to complete the mission is complex, but significant progress is being made in tank cleaning and preparing for closure.

In 2011, 15 of the Site’s 22 remaining old-style tanks were in various stages of a seven-step process to prepare them for cleaning and eventual closure. The effort places more waste tanks in the closure process than at any time in the history of SRS. Also during the year, the bulk waste removal effort was completed on three tanks, a record for annual bulk waste removal effort.

Besides the removal of bulk waste, the seven-step cleaning process includes mechanical heel removal, chemical cleaning, cooling coil flushing, annulus cleaning, final sampling and isolation. Operational closure ends with the tank being filled with grout.

Tanks 18 and 19 are scheduled to be grouted and closed in late 2012, followed by Tanks 5 and 6 in the coming years.

Robots Go Where No Human Can Go

Remote-controlled robots, such as the version nicknamed “G.I. Joe,” play an instrumental role in SRR’s waste tank cleaning and sampling.

Introduced to tank cleaning operations in 2009, the robots traverse the bottom of the Site’s waste tanks inspecting and collecting samples. G.I. Joe uses a small sample vial that is scrapped along the tank’s bottom to collect samples. G.I. Joe then places the vial in a basket, which is removed, packaged and shipped to the Savannah River National Laboratory for analysis.

The robots, which run on small bulldozer-like tracks, are designed and constructed to maneuver through a maze of cooling coils in the bottom of tanks and other obstructions to get to otherwise inaccessible locations where small deposits of residual waste may remain.

By applying recent advancements in robotic technology, coupled with the creativity of SRR employees, SRR has significantly accelerated its ability to cost effectively close waste tanks while enhancing the safety for workers.

SALT PROCESSING TECHNOLOGY TO SAVE DOLLARS, YEARS

Savannah River Remediation (SRR) employees continued a major effort in 2011 to improve and deploy a technology called the Supplemental Salt Initiative (SSI) to accelerate salt waste processing and tank closure at the Savannah River Site.

The major SSI focus during 2011 was development of the Small Column Ion Exchange (SCIX) technology and the advancement of an organic liquid called the Next Generation Solvent (NGS), both essential components of SRR’s accelerated nuclear waste cleanup efforts.

SCIX is a chemical process that removes radioactive constituents, such as cesium and other insoluble solids from salt waste contained in the radioactive liquid waste tanks. Removing these constituents allows for the remaining salt waste to be processed more quickly.

The NGS was designed to be similar to the solvent currently used to extract radionuclides from radioactive salt waste, but is more effective in extracting cesium from the waste, which is necessary before the waste can be dispositioned.

The NGS has a higher solubility that allows the solvent to remove more cesium. The cesium is high-level waste, which is transferred to the Defense Waste Processing Facility for disposition. The remaining waste is low-level waste. It is transferred to the Saltstone Facilities for disposition.

The improved performance characteristics of NGS are anticipated to increase the rate at which the waste can be decontaminated through the Salt Waste Processing Facility (SWPF). If the solvent proves its effectiveness, it is scheduled to be placed into service in the second year of operation of the SWPF, which is currently under construction.

Together the SCIX and NGS will accelerate SRR’s mission to operationally close hazardous waste tanks at a tremendous cost savings.
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SRR ARRA was "shovel ready" in September 2009 when authorized $200 million through the American Recovery and Reinvestment Act (ARRA).

The mission was simple. Put people to work who could safely accelerate SRR’s mission to close hazardous waste tanks at Savannah River Site (SRS).

The SRR ARRA program completed in December 2011 with SRR completing the 41 identified projects on schedule and on budget. During the program, SRR Recovery Act employees worked safely and, when finished, had advanced more SRS waste tanks further in the closure process than at any time in the history of SRS.

The activities involved work in four major areas:

- **Waste Treatment** – Design and install components to enhance Defense Waste Processing Facility (DWPF) and Saltstone operations. (11 activities)
- **Salt Disposition Integration** – Install salt processing infrastructure to support Salt Waste Processing Facility (SWPF). (12 activities)
- **Tank Closure Infrastructure** – Equipment installation and infrastructure modifications to support tank closure activities. (14 activities)
- **Facility Operations** – Design and install modifications to support enhanced salt and sludge waste removal. (4 activities)

**ARRA - 2011 Annual Review**

**SRS WASTE TANKS CLOSER TO CLOSURE THANKS TO ARRA**

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**RECOVERY ACT HIGHLIGHTS:**

- Designed, built and installed argon bubblers in DWPF melter, resulting in 39 percent increase in canister production.
- Designed, fabricated and placed into operation a new argon tank to support the increase in DWPF canister production.
- Designed and built a shielded cell and waste concentrate hold tank for the Effluent Treatment Project to enable batch transfers of low-level waste directly to Saltstone.
- Designed and constructed two salt solution receipt tanks at Saltstone in support of startup and uninterrupted operation of SWPF.
- Fabricated and installed a larger capacity nitrogen tank at DWPF to support preparation of DWPF to receive SWPF feed.
- Installed infrastructure and equipment to prepare Tank 13 for bulk waste removal.
- Completed mechanical and electrical systems isolation of Tanks 18 and 19 as the next step toward operational closure of the tanks.
- Designed and fabricated Enhanced Chemical Cleaning testing equipment and initiated designs for Chemical Cleaning Infrastructure to reduce the impact on tank space and accelerated tank closure.
- Fabricated and installed a chemical truck unloading station and 10,000-gallon storage tank for SWPF blend and feed tanks, which will reduce worker exposure and decrease the potential for hazardous spills.

**ARRA BY THE NUMBERS:**

- Over 1,500,000 safe hours through December 2011, without any lost workday injuries
- $83.6 million in total procurements
- $45.5 million in procurements from small business
- $31.9 million in procurements from local area
- SRR ARRA workforces peaked at over 600 full-time equivalents

More than 2,100 lives were touched.
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Building bridges through supporting the community continues to be at the heart of Savannah River Remediation (SRR) and its employees.

SRR has given hundreds of thousands of dollars to areas that include education, health and welfare, civic and social work, and cultural performances and programs. We believe that supporting these areas raises everyone’s quality of life.

In addition, our employees continue to demonstrate compassion to charitable causes, realizing that it is better to give than receive. From donating food for the annual Golden Harvest Food Bank Drive to ringing Red Kettle bells for the Salvation Army, SRR employees have shown a dedication to help those less fortunate. SRR employees have given from their pocketbooks and from their time, volunteering as mentors, performing home repairs and serving on committees, all with a commitment to help others.

Under an employee-based safety program, SRR continues to donate $500 a month to local charities, selected by employees, when employees work the month without a days-away injury. Since inception in 2009, SRR has donated $12,000 to local charities through this program.

In education, SRR believes in preparing today’s young people for a brighter future. For example, we employed more summer college interns last year than ever before. The company also provided over $60,000 in scholarships to students and universities around the state.

On another front, SRR continues its financial support for seasonal flu shots in Barnwell and Allendale counties to assist low income individuals and senior citizens hit hard in today’s economic climate.

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Also, SRR continues providing economic development incentive and seed money to area groups whose mission is to bring more jobs to our area.

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By building these bridges to our communities, SRR and our employees have continued to do the right thing, touching the lives of many people.
The Savannah River Site (SRS) is owned by the U.S. Department of Energy. Savannah River Remediation LLC manages and operates the liquid waste mission at SRS.