SRS Heritage Foundation
NEWSLETTER

February, 2012

SRNS Continues as Corporate Sponsor

Savannah River Nuclear Solutions Executive Vice President Fred Dohse presented a check for $10,000 to the SRS Heritage Foundation at the annual SRNS Holiday Drop-in. Walt Joseph, Executive Director of the Foundation, described the contribution as "an early Christmas present" and expressed sincere gratitude that SRNS continues to be a Corporate Sponsor of the Foundation.

SRS Tours Scheduled

SRNS will once again offer free public tours of the Savannah River Site. Approximately 1500 visitors will have the opportunity to tour the Site in 2012. The 30 tours are scheduled for the following dates:

January 10, 18, 26	February 15, 23	March 13, 21, 29
April 17, 26	May 8, 16, 24	June 12, 20, 28
July 10. 18, 26	August 14, 22, 30	September 11, 19, 27
October 9, 17, 25	November 7	December 5

Anyone interested in attending one of these tours can register at http://www.srs.gov/genneral/tour/public.htm

Individuals without internet access may call 803-952-8467 or 803-952-8994.

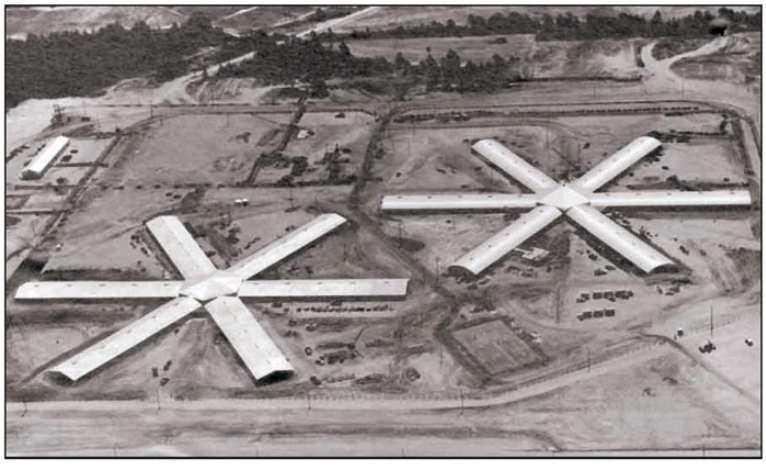
SRS at Sixty

By Art Osborne

By the summer of 1951 the necessary evacuations from the site were complete and construction was shifting into high gear. DuPont's invading army of scientists, engineers and construction personnel numbered into the thousands. DuPont formed a new Atomic Energy Division for the design, construction and future support of SRP. In the CSRA every habitable housing nook and cranny was filled and more were being constructed as rapidly as possible. The sunlight was reflecting from the roofs of hundreds and later thousands of portable trailers set up to house the construction force. The construction force peaked in the early fifties at about 39,000.

The Atomic Energy Commission (AEC) assigned Curtis Nelson as the first Savannah River Operations Office manager. DuPont assigned Bob Mason as the Project manager and named Granville Read Chief Engineer. The DuPont company project number for the job was 8980**.** Initial office space was located and rented throughout the CSRA. Great care was taken to ensure and protect the secrecy that enveloped the project and all associated work. In May, 1951 the first DuPont personnel were able to move onto the site to the newly constructed TC-1 and TC-2 building. These "temporary construction" buildings were quickly erected and served the site well for many years. They were built using a central Hub and six evenly located spokes radiating out from the hub. Rumors quickly starting flying that the spokes were the production areas and the "BOMB" came together in the hub. This has ensured that for many years, and in some quarters even today, the SRS would be known as "The BOMB Plant".

The scope and tasks for the new site were incredible and on a scale never before seen. The technology and needs were constantly changing as scientists and engineers learned more about the needs and best processes for the new thermonuclear defense strategy necessary to defend the country and keep pace with the USSR. The Korean War and developments behind the Iron Curtain lent an air of urgency to the entire undertaking.



Some 300 square miles of South Carolina countryside were being converted into a mammoth industrial complex for five nuclear reactors, two giant chemical separations canyons, and all the necessary supporting production, maintenance and administrative areas. The need for a major research and technical support laboratory was seen and plans were made for the Savannah River Laboratory. This lab is known today as the Savannah River National Laboratory and not only supports SRS but also addresses national issues including energy independence, national security, and environmental cleanup. Major security and medical requirements were needed to support the site's work and ensure the safety and health of employees and the general public. The access and vehicle requirements included many miles of roads, 4 lane highways, railroads and South Carolina's first highway cloverleaf. Highways from North Augusta and Aiken to the site were among the first major jobs completed.

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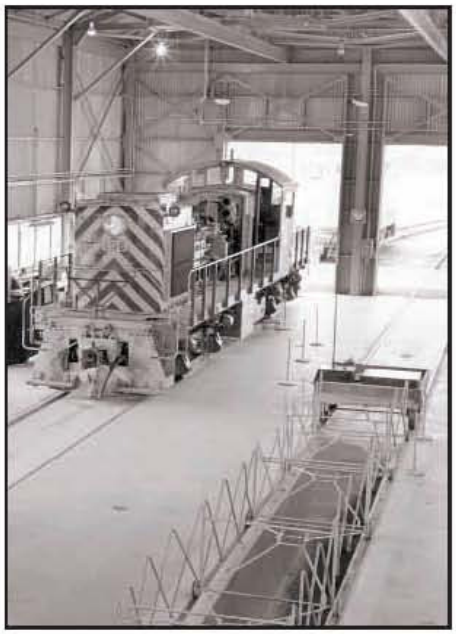
Design of the plant required a flexible approach. A two pronged approach was used. The first approach called for design to move ahead based on past experience and known technical specifications. It could be delayed as required by changing specifications. The second design approach was to specify designs that allowed for future changes. It was recognized that AEC directives on what products and product mixes were needed by the developing DOD weapons program would be evolving and changing for some time to come…

DuPont enlisted the support of other US companies through a series of subcontracts for design and construction of various facilities. For example, the William A Smith company designed and built sixty miles of railroad track and the necessary yard and engine house for the SRP railroad. The railroad was needed to connect the reactor areas to the separation areas and allow for fuel assembly movement in heavily shielded railroad cask cars. The railroad also provided for the delivery of large specialty items and coal to the electrical powerhouses located throughout the site.

Among the first things completed was the development of the sites identification and nomenclature, This was an absolute must to gain control of the equipment and materials arriving daily. Each production area and building classes were given unique number and letter designations. This made communication and identification a relatively easy and sure thing. Today when you meet a SRS employee and ask were they work or used to work they will likely respond with a number in the hundreds or a letter.

100 - Reactor	100-R,P,L,K, and C
200 - Separations	200-F and H
300 - Fuel and target fabrication	300-M
400 - Heavy Water production Area	400 M
500 - General (lighting, power transmission, substations, etc.)	500-G
600 - General	600-G
700 - Administrative	700-A
900 – General	

Personnel for the site were being hired, trained and moved into the CSRA at a record pace. Training for operations personnel was underway at several sites across the country. Reactor training was done at Argonne near Chicago. As many as 317 people were assigned there for SRP training in 1952. Training of personnel was also done at Hanford by coordinating with GE the Hanford contractor at that time. Training for the Heavy Water production area was provided by the Girdler Corporation at its DANA works in Indiana. Training for the separations work took place at Oak Ridge and Knolls Atomic Power Laboratory. In 1951, ‘52 and into ‘53 hundreds of personnel received training for the operation of the new facilities being constructed in South Carolina.



(Above) The Locomotive Shop was equipped to accommodate four engines, and all maintenance work. Courtesy of SRS Archives, negative 1785-3.

H Area 1978. Courtesy of SRS Archives, negative 28320-1

Preserving & Interpreting Savannah

Neutrino Bites the Dust

An errant automobile toppled the historical marker celebrating the neutrino January 17th. The car went out of control as it was traveling east on Richland Avenue, jumped the curb, flattened the marker, crossed the sidewalk and damaged the hedge in front of the Aiken Chamber of Commerce before coming to a halt. Fortunately, no one was injured and the driver's insurance will cover the cost of replacing the historical marker.

The scope and duration of the effort to replace the neutrino marker had not been determined at press time.

L to R: Ronnie Young, Walt Joseph, Lester Welch, Fred Cavanaugh, and David Jameson at the unveiling of historic marker at the Neutrino Celebration on August 27, 2010.

Preserving & Interpreting Savannah River

SRS Pu-238 Plutonium in Space Exploration

By Ron Gregory

For almost three decades SRS reactors and canyon facilities produced all of the Pu-238 for long-term NASA space missions that have explored the far reaches of the solar system. Pu-238 was used to create reliable electrical power and heat for missions that lasted from a few years up to several decades. The Pu-238 produced by SRS played a vital role in the success of these missions and contributed to a wealth of new discoveries.

Pu-238 is the ideal isotope to use as an energy source for long space missions because it has a high power density (0.5 thermal watts per gram) and a long half-life (87.4 years) The alpha radiation produced from Pu-238 decay can easily be shielded from spacecraft electronics without adding significant weight.

Np-237 was created in SRS reactors as a byproduct of Pu-239 production. Starting in the late 1950's, it was recovered in canyon facilities and used to create target elements. These targets were then irradiated in SRS reactors to produce Pu-238.

After separation in canyon facilities, the Pu-238 was processed to plutonium oxide and shipped to other DOE facilities where it was used to construct Radioisotope Thermo-electric Generators (RTGs) and Radioisotope Heater Units (RHUs) for NASA space programs. *Continued on page 5*

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RTGs supplied all the electrical power for these missions. They converted heat directly to electrical power using a matrix of thermocouple elements. While this method of electrical generation is only 10% efficient, it is extremely reliable since it requires no moving parts. DOE supplied a total of 44 RTGs that were used for 22 successful NASA missions launched from 1961 through 2006. These included:

- Seven satellites, four navigational, one meteorological and two communications. Launched from 1961 to 1976
- Five Apollo moon-landing missions where the RTGs were left to power scientific packages. Launched from 1969—1972
- Viking 1 & 2 Mars landing missions.
- Pioneer 10 & 11 launched in 1972 and 1973 that flew by Jupiter and Saturn. RTG's are still operating
- Voyager 1 & 2 that were launched in 1977. They flew by Jupiter, Saturn, Uranus and Neptune and are still transmitting data from the edge of the solar system.
- Galileo mission was launched in 1989 and surveyed Jupiter and its moons for eight years.
- Ulysses mission launched in 1990 is still surveying the sun and its poles.
- Cassini mission launched in 1997 has been surveying Saturn and its moons since 2004.
- New Horizon mission that was launched in 2006 and is expected to arrive at Pluto in 2015.

RTGs were also aboard three missions that failed for reasons unrelated to them:

- One navigational satellite failed to reach orbit and burned up on reentry.
- One meteorological satellite was aborted during launch. The RTG was recovered and recycled.
- The Apollo 13 mission was aborted on the way to the moon and the RTG reentered the earth's atmosphere aboard the Lunar Excursion Module that sank in the South Pacific Ocean.

No radiation releases were detected from any of these failed missions.

SRS also produced 216 Pu-238 fuel pellets needed for the two Galileo RTGs and the Ulysses RTG. To contain the fuel during any potential accident, the Pu-238 was converted into a ceramic form and encapsulated in iridium using the F-Area Plutonium Fuel Form Facility (PuFF). This ceramic form is insoluble in water, fractures in largely non-inhalable chunks, and is not easily vaporized. Iridium is a rare metal that was used because it is extremely strong and has a very high melting point.

Ceramic Pu-238 pellet glowing from its own heat

Originally, the RTG for the New Horizons mission was to be fueled with 10.9 kg of newly-processed PU-238 from Russia, but because of delays and a shutdown of the Los Alamos processing facility in 2004, only a small amount of that fuel was available. As a result, the RTG was fueled with only 9.75 kg of total plutonium that was a mixture of the newly-processed Russian fuel and fuel that had been produced by SRS in the 1980's. When launched, this RTG produced 15% less power than originally planned, but it was still considered adequate to complete the mission to Pluto.

DOE has supplied more than 240 RHUs for NASA missions. These are small packages each producing about one watt of thermal energy. They were used to keep sensitive equipment warm and operable in near absolute zero temperatures experienced by these spacecraft. RHUs were used in a seismic package left on the moon during Apollo 11, in several Mars rovers and in the Galileo and Cassini spacecraft.

The future of US deep space exploration is uncertain now that SRS is no longer producing Pu-238 for these missions.

THANKS TO OUR SRS HERITAGE FOUNDATION SPONSORS 2011

We are particularly pleased that several organizations have such faith in our future that they have made substantial financial contributions to our programs.

Among these supporters are:

Corporate Sponsor
Savannah River Nuclear Solutions

Corporate Member
Savannah River Remediation, LLC

Business Member
Security Federal Bank

A special thank you to the individual members for their continued support of the Foundation

JOIN THE SRS HERITAGE FOUNDATION TODAY!! WE NEED YOUR SUPPORT!

HEY EVERYBODY IT'S TIME TO RENEW!

The New Year has arrived and it's time to show your continuing support of the SRS Heritage Foundation by renewing your membership. You are an important part of our base of supporters of the SRS Heritage Foundation. We **need** you and **want** you in order to continue to preserving the history of the Savannah River Site and making it available to all.

Good progress continued in 2011. A major program celebrating the 60th anniversary of environmental science at SRS was held in August. A grant to conduct interviews for a new video on the Cold War was obtained and the interviews have begun.
The Foundation will also continue with talks to various groups and exhibits around the area.

Your continuing membership is **very** important to the Foundation. Financial support helps us with projects to preserve Site history. But, **numbers** of members are also important to establish a broad base of support and to show to government entities and other sponsors that the Foundation represents a strong segment of the population.

The SRS Heritage Foundation is a 501(C) 3 non-profit organization open to all individuals, businesses and corporations. Membership dues are tax deductible for federal income tax purposes.

The membership term is on an annual basis running from January through December of each calendar year. Dues collected from CONTINUING members in December shall be applied to the following membership year. Dues from NEW members who join as late as October shall be applied to the following membership year.

Please renew your membership and continue your support of the SRS Heritage Foundation. You may complete the membership form and mail it to:

SRS Heritage Foundation
P. O. Box 2226
Aiken, SC 29802

The membership list is confidential and is not released or sold.

If you prefer the convenience of renewing electronically, you may do so by going to tixonline.com. A small charge will be added for this service. Thank you. ***Merrilee Anderson, Membership Chair***

Check out our website for an application or see Page 7.

Thank you for your continued support!!

Preserving Savannah River Site History and Heri-

If your information hasn't changed,
you can just put your check in the mail!!!

SRS HERITAGE FOUNDATION MEMBERSHIP APPLICATION

I would like to become a member of the SRS Heritage Foundation in the following level. (Please Check One)

Benefactor	*$120.00*	☐
Patron	*$ 60.00*	☐
Sustaining	*$ 35.00*	☐
Student	*$ 15.00*	☐
Small Business	*$ 250.00*	☐
Corporate Member	*$1,000.00*	☐
Corporate Sponsor	*$5,000.00*	☐

I would be willing to help with Publications___, Membership____, Fundraising___, Publicity____, other____

This membership is valid through December 2012

Name:
Address:
City, Zip Code:
Phone:
Email (s):
Fax #:

My check, made out to the SRS Heritage Foundation, Inc. is enclosed. Contributions to the Foundation are tax exempt. Federal ID#20-1629370

Please mail to:
SRS Heritage Foundation, Inc.
P.O. Box 2226
Aiken, SC 29802
Phone: (803) 226-0116 or 648-5634
Email: SRSHeritageFoundation@gmail.com or qualityprt@aol.com

Preserving & Interpreting Savannah River Site History

We need your support,

join today and your membership

will be in good until

December 31, 2012