

SRS: COLD WAR PRESERVATION PROGRAM



Source: <http://nielsbrockprogram.swsi.wikispaces.net>

Mary Beth Reed, Historian, New South

Parodio Maith, DOE

Andrew Albenesius, Manager, SRNS, Cold War Preservation Program

Melissa Jolley, Cold War Collection Curator, New South

June 11, 2013



Purpose

- To provide an update on the SRS Cold War Preservation Program and to fulfill a Strategic & Legacy Management (S&LM) 2013 Work Plan topic.



Driven by the National Historic Preservation Act



President Lyndon B. Johnson signs NHPA, 1966

Fostered the system by which federal agencies...

survey and identify

districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture, and

use this information to plan projects so that, where possible, historic places are preserved.



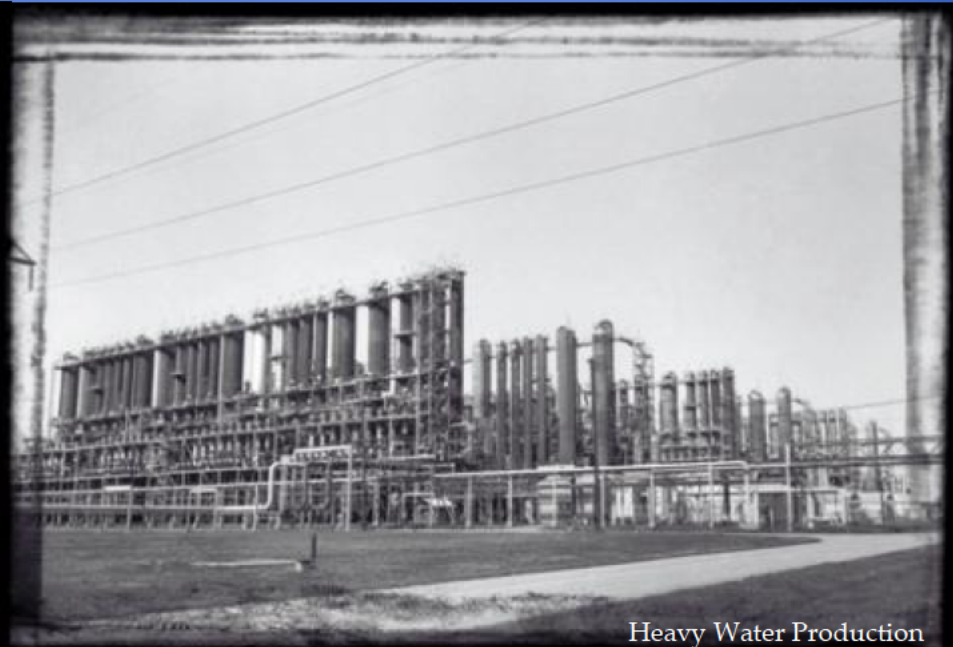
Preservation of Modern History 1950 to 1989



Program developed as part of the Site's Fiftieth Anniversary



Interior view of Fuel and Target Facility



Heavy Water Production

SRS recognized the Site's Cold War facilities and equipment as potentially significant and began its Cold War inventory as

- required under the NHPA.

Programmatic Agreement

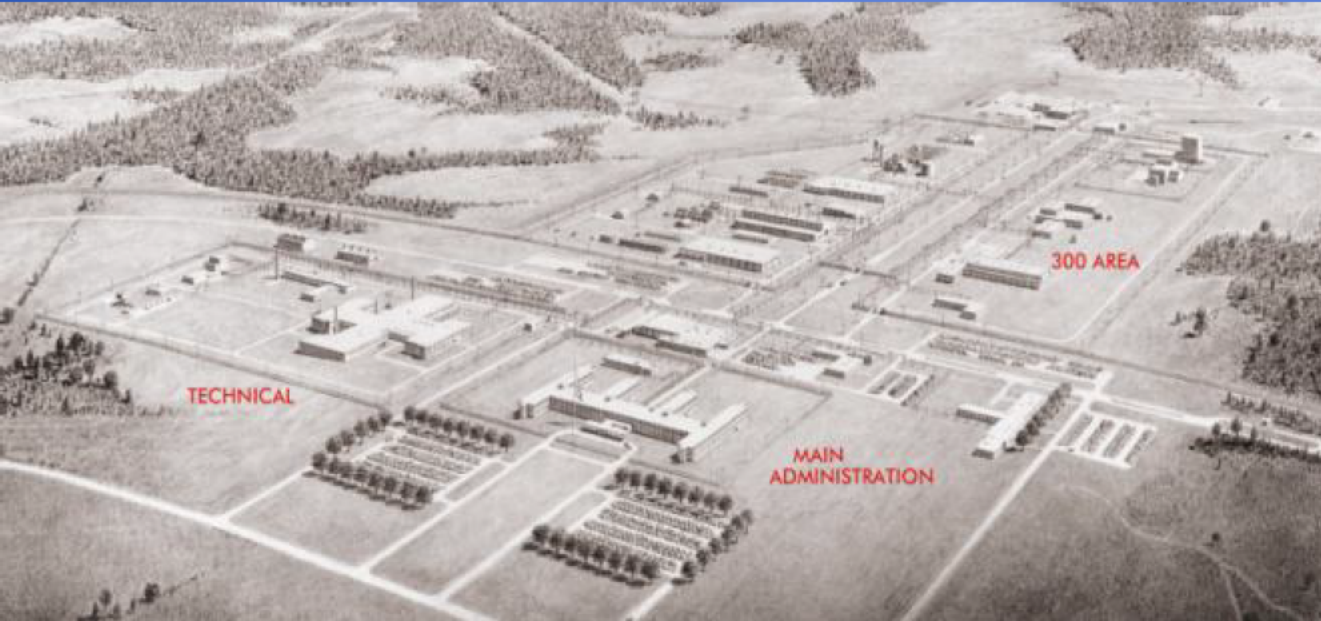


Developed with State Historic Preservation Office, Advisory Council, and local stakeholders

For the identification and treatment of resources and artifacts that date from the Site's selection to the end of the Cold War.

- We identify facilities for preservation
- We write histories
- We collect and manage artifacts
- We provide public outreach

Program Objectives – Resource Identification



A Area Conceptual Plan Created by
Voorhees, Walker, Foley & Smith, 1952

220 Cold War resources
identified as significant

Site Layout

Considered a National
Register-eligible Cold
War historic district



Administration Building after
Completion

Under DOE's Section
110 responsibilities
others will be surveyed
as facilities reach 50
years of age or meet
Criterion Consideration
G

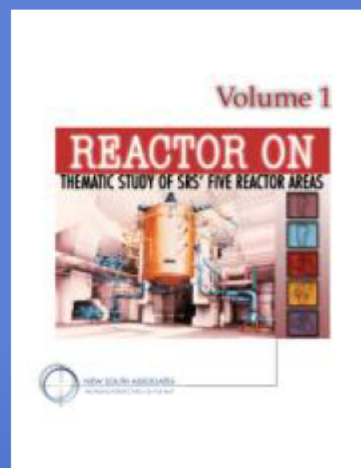
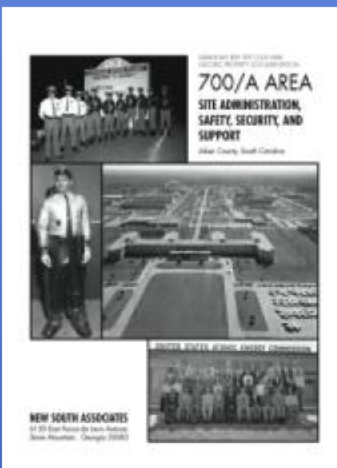
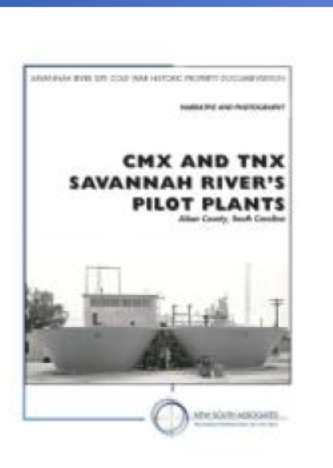
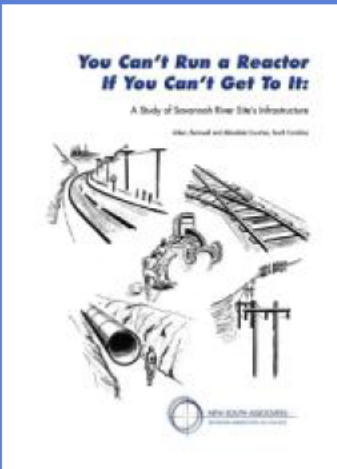
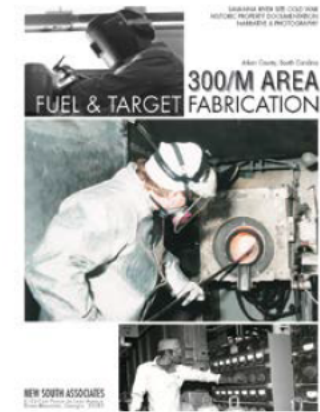
Program Objectives - Documentation

Historic American Engineering Record Documentation of 777-10A, archived at Library of Congress, available online

6 completed thematic studies are available for download from SHPO website or can be used at library

Separations study in draft

Research and development study to be initiated this year



Thematic Studies are linked to Plant Processes

Excerpted From



WE DON'T DIG URANIUM OUT OF THE GROUND, AND WE DON'T MAKE BOMBS

BUT WE DO NEARLY EVERYTHING IN BETWEEN.

PLANT PROCESSES

Circa 1962

Before being charged to the reactor, fuel and target materials are formed into aluminum-clad cylindrical "elements." The aluminum cladding minimizes corrosion and seals radioactive products within the elements.

FUEL AND TARGET FABRICATION



"First forge the fuel..."

Savannah River's large production reactors are moderated and cooled by circulating heavy water. In the stainless steel reactor tank, long cylindrical assemblies of fuel and target elements are positioned in a precise geometrical pattern to form the reactor lattice. Remotely-controlled machines for charging and discharging reactor elements are shown above the reactor top.

REACTOR IRRADIATION



...put the heat where it's needed...

Chemical processing of irradiated materials produces radioactive liquid waste. This material is concentrated and stored in large underground tanks to prevent contamination of the plant environs. Safe management of wastes requires continuous surveillance.

WASTE MANAGEMENT

LABORATORY GOALS

Today, we direct the Laboratory's resources increasingly toward peaceful aims - electric power from heavy water reactors, the chemical processing of spent power fuels, the recovery of specific fission products, and the manufacture of special radioisotopes.



...then mix judiciously with D₂O...



"We make practically all of the free world's supply of heavy water."



HEAVY WATER EXTRACTION

Heavy water (D₂O) used to moderate the reactors is extracted from natural water in a gas-liquid exchange process, which concentrates the trace amounts (0.015%) of heavy water in the Savannah River to about 15% D₂O. A final distillation stage yields extremely pure D₂O at a concentration greater than 99%.

SEPARATIONS

After irradiation, fuel and target materials are chemically processed in remotely-controlled shielded facilities to remove radioactive byproducts, to purify the desired product, and to recover the valuable unburned nuclear fuel. A mockup is shown of the process vessels designed for remote operation and maintenance.

PRODUCTS

PLUTONIUM-238

Produced by neutron irradiation of neptunium-237, a byproduct of uranium irradiation. Valuable for its heat generating capacity.

CURIUM-244

Properties and applications similar to plutonium-238.

PLUTONIUM-239

Used as a nuclear explosive, a breeder reactor fuel, or as the starting target material for production of heavier radioisotopes.

TRITIUM (3-HYDROGEN-3)

A radioactive isotope of hydrogen, component of thermonuclear explosives, and a potential fuel for thermonuclear fusion power generation.

COBALT-60

Known radiation source and has long been used for radiotherapy.

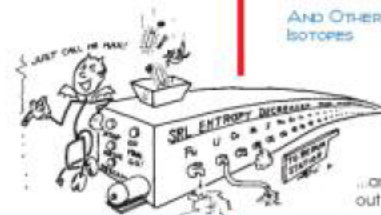
CALIFORNIUM-252

One of the rarest man-made isotopes, has great potential value in medicine, industry, research, and education.

HEAVY WATER (D₂O)

Important nonradioactive product of the Savannah River Plant. It occurs at a concentration of 0.015% in natural water and must be concentrated to 99+% to be useful in reactors as a neutron moderator.

AND OTHER RADIOACTIVE ISOTOPES

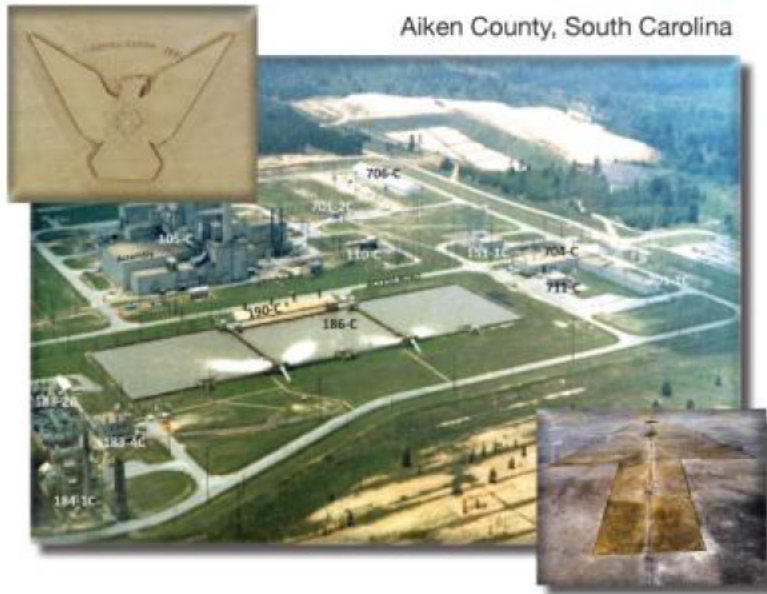


...and lastly, squeeze out the goodies!"

Program Objectives: **Preservation**

Savannah River Site's Cold War Built Environment Cultural Resources Management Plan, 2011-2016

Aiken County, South Carolina



Preservation planning for Site

Working with Site Archives

Partnering with Savannah
River National Laboratory

Most importantly, educating
the work force

Program Objectives: **Curation**



315-M = Curation!

Facility where artifacts are collected, stored, catalogued, and studied

Provides climate controlled environment

Provides work space for curator and researchers

Houses both Cold War and SRS archaeological collections

Program Objectives: Public Outreach



MIGHTY FORCE

Between January 1951 and 1955, the Atomic Energy Commission constructed a self-sufficient industrial plant that was considered the largest single construction job it had ever undertaken. Its magnitude and scope were unequalled, in a half century punctuated by immense engineering and construction projects such as the Panama Canal, Tennessee Valley Authority, and the AEC's own Manhattan Project-era plants at Oak Ridge, Tennessee, and Hanford, Washington. At peak construction in September 1952, 38,582 workers labored 54 hours a week under the direction of Du Pont engineers. South Carolina (25,019) and Georgia (13,776) contributed the majority of the project's construction force; however, forty-nine states and the Panama Canal Zone were also represented in the ranks.

Design flowed from Du Pont and its subcontractors drawing tables through the national laboratories and the Atomic Energy Commission. Five reactors, two chemical separations plants, a heavy water plant, a fuel and target manufacturing area, and laboratories were joined by over sixty miles of railroad, 250 miles of new roads, the state's first cloverleaf intersection, power plants, and other infrastructure. Three safety awards were earned by the project, a coup for Du Pont's Construction Field Manager Bob Mason. And an esprit de corps, shown in the project newspaper "SRP News and Views" and in athletics and other recreational events, was fostered by the schedule, secrecy, purpose, and magnitude of the project.

(Above Left) Safety meeting at heavy water production area. Courtesy of the SRP Archives. Hegaline No. 576-2. (Left) Caricature of Bob Mason, Field Project Manager holding plot buildings in his hands, honoring his role in the project. Courtesy, The Mason Family. (Below) Billboard signage at plant oblonging safety record, 1952. Courtesy, SRP History Project (Right) Excavator for reactor. Courtesy of the SRP Archives. Hegaline No. 144-1.



This is the **Safest**
CONSTRUCTION JOB
IN THE WORLD
Employees HAVE SET 3 WORLD'S RECORDS

4,882,783	SAFE HOURS	JAN. 30, 52
6,228,072		APR. 25, 52
10,048,180		JULY 3, 52

MEMORANDUM 1952-10-11

Organize Heritage Tourism meetings for preservation community within the CSRA

Help to update Site exhibits/websites

Develop traveling exhibits

Encourage all personnel to learn about the Site's past

Program Objective: **Compliance**



- Ensure DOE is in compliance with NHPA
- Maintain up to date training in safety and security
- Maintain Historic Preservation Advisory Team Meetings
- Quality Assurance Plan



Feature –

How buildings,
photographs, and
artifacts tell a story...

The Medical Building's
Decon Suite

Special Emergency Room/Isolation Area

- Suite of seven rooms created to treat critically irradiated personnel in case of an incident
- Accessed by a Special Ambulance Entrance



Lead Bath

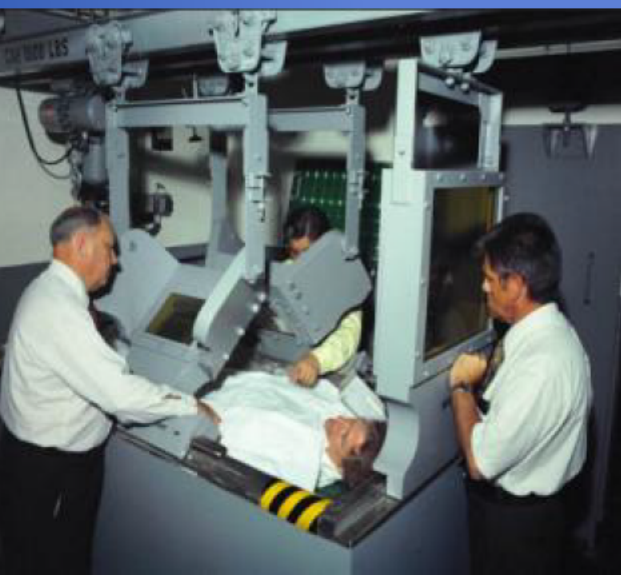


Preparedness

- Lead bath installed in response to an incident at Idaho in 1961 at SL-1
- Equipped with lead shields with viewing windows to protect medical personnel
- Ability to seal off room with sliding shield doors

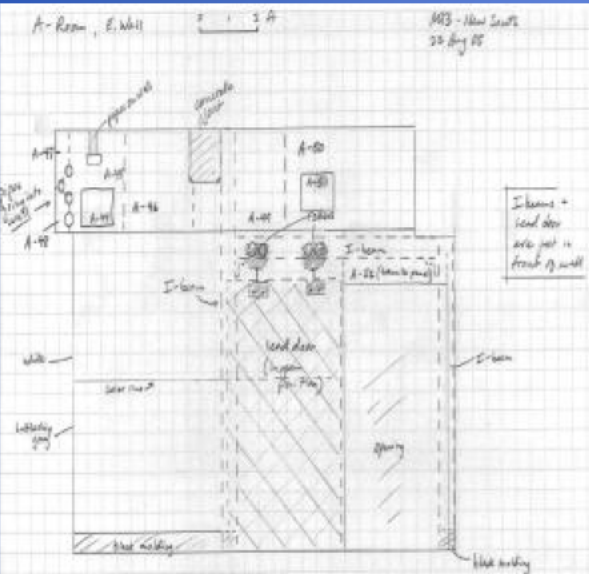


Photographic Sequence Showing Decontamination Bath Procedure, ca. 1965



Source: SRS Photo Services

Identification and Evaluation Leads to ... Preservation Success Story



- The Decon Suite at SRS was fortunately never needed
- It was a well preserved Cold War artifact that spoke volumes about Site Safety a major theme for the Cold War
- Suite and its contents drawn to scale and photographed, building plans preserved
- Historic photography was used to better understand what we were seeing
- Contents including the lead bath were saved and are stored in 315-M for future interpretation