

SRS Facts

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Nuclear Materials Management at SRS

Nuclear materials are materials that contain unstable atoms. In an effort to become stable, these materials release excess energy called radiation. Nuclear materials occur naturally in small quantities and are also manufactured in nuclear reactors. Three primary types of nuclear materials are managed at the Savannah River Site (SRS).

- Special Nuclear Materials (SNM) refer to those materials with the potential to be made into nuclear weapons. SNM includes plutonium-239, uranium-233, and enriched uranium (U-235), as well as others.
- Tritium is a radioactive gas used to enhance nuclear weapons.
- Spent nuclear fuel (SNF) refers to fuel assemblies that have been irradiated in a nuclear reactor and subsequently removed.

SRS Role in Nuclear Materials Management

SNM, tritium and other nuclear materials were produced in nuclear reactors at SRS from 1953–1988. SRS no longer operates nuclear reactors. Today, the Site's nuclear materials management missions include:

- Recycle and extract tritium, which is manufactured in reactors at other locations
- Provide safe and secure interim storage of SNM and SNF
- Secure vulnerable global nuclear materials
- Process SNM and SNF into valuable assets and stable forms

SRS has the nation's only large-scale nuclear facilities capable of tritium recycle and extraction and nuclear materials processing. We are also the premier large-scale site for secure storage of surplus and vulnerable SNM and UNF. These activities are vital to environmental stewardship, the nation's security and the goal of international nonproliferation.

Our Nuclear Materials Missions

Recycle and Extract Tritium SRS operates the nation's only full-scale tritium processing facilities. Tritium is a radioactive isotope of hydrogen and a key component of nuclear weapons, but it decays at the rate of 5.5 percent each year and must be replenished continually. This is accomplished by recycling tritium from existing nuclear warheads,



Effective Nuclear Materials Management for the Nation

Prepare the nation's only tritium supply for our nuclear deterrent

Secure materials to prevent international terrorism and proliferation

Process nuclear materials into valuable assets and stable waste forms

Develop and deploy highly innovative approaches to address nuclear materials challenges



Nuclear Materials Management at SRS *(continued)*

and by extracting tritium from target rods irradiated in nuclear reactors operated by the Tennessee Valley Authority. Recycled and extracted gases are purified to produce tritium that is suitable for use in our national security.

Store Material in a Safe and Secure Manner SRS maintains state-of-the-art storage facilities that are rigorously designed and secured to minimize the probability and consequence of an accident. SNM is stored in the K Area Complex in engineered storage packages. Highly skilled operators and security forces perform continuous monitoring and surveillance. SNF is stored in the L Area Complex in robust underwater storage facilities designed to shield workers and the environment from radiation.

Secure Vulnerable Global Materials Hundreds of tons of proliferant nuclear materials exist worldwide under varying safety and security conditions. SRNL works with nations throughout the world to stabilize, package, and ship vulnerable materials to secure locations around the globe, including SRS. SRNL also works with international agencies to deploy nuclear materials forensics, security, and detection technologies.

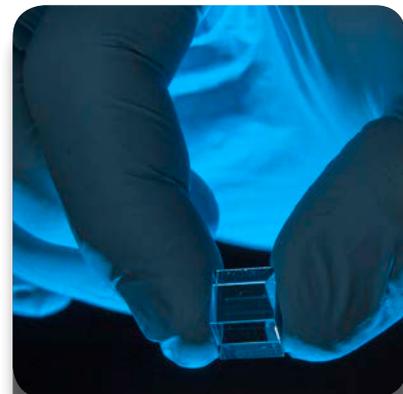
Process Nuclear Materials SRS operates the nation's only full-scale nuclear materials processing and waste immobilization facilities. The H Area Complex uses chemical separations technologies to dissolve materials and separate desired nuclear materials from waste products. Waste products are immobilized in a glass matrix and safely stored pending off-site shipment.

The Savannah River National Laboratory

The Savannah River National Laboratory (SRNL) develops and deploys innovative approaches to address nuclear materials challenges. Highly skilled scientists and researchers provide expertise in tritium supply and stockpile maintenance, nuclear materials packaging, detection, processing and disposition, and environmental remediation and risk reduction. SRNL supports customers at SRS, throughout DOE, at other federal agencies, across the country and around the world.

Safety: The Cornerstone of SRS

At SRS, our number one priority is protection of our workers, the public and the environment. When it comes to management of nuclear materials, SRS employs some of the world's premier nuclear safety analysts. Teams of analysts consider every possible event scenario that could occur when handling or storing nuclear materials and then implement design features to reduce the frequency of those occurrences. In the very unlikely case that an event did occur, the materials would still be protected because of robust engineered and operational controls.



How are Nuclear Materials Used?

Medicine: Diagnosis, treatment and research

Science: New drug testing, biomedical research, criminal investigation

Industry: Radiography, radiotracers, radiation processing, weld examination

Agriculture: Plant breeding, insect control, food preservation

Consumer Products: Smoke detectors, tires, computer disks, nonstick pans

Security: Detection of concealed Special Nuclear Materials, weapons, explosives, narcotics

Archaeology: Measure ages of rocks, minerals and fossils

Space exploration: Energy source for spacecraft

Energy: Twenty percent of nation's electricity

Weapons: Nuclear deterrent

