



**Savannah River
National Laboratory®**

OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS

We put science to work.™

Savannah River National Laboratory:

Future Mission Support at Savannah River Site

Dr. Vahid Majidi

Director, Savannah River National Laboratory

National Cleanup Workshop

September 12, 2018



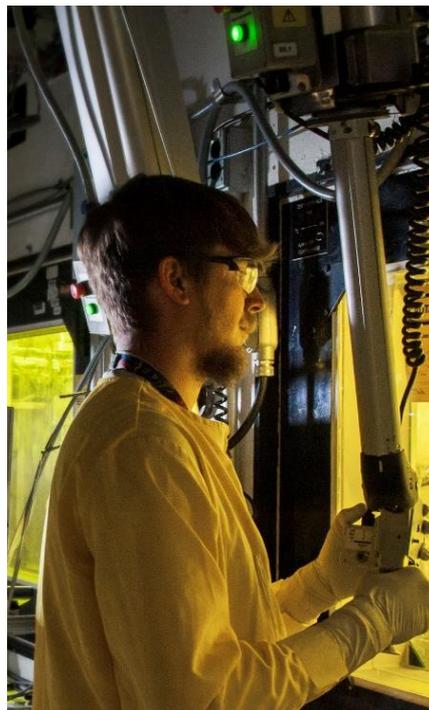
Multi-Program Lab Approach



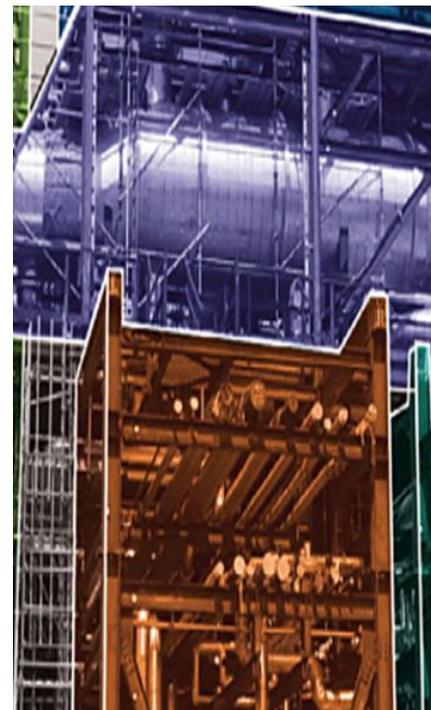
Environmental
Stewardship



National Security



Nuclear Materials
Management



Secure Energy
Manufacturing



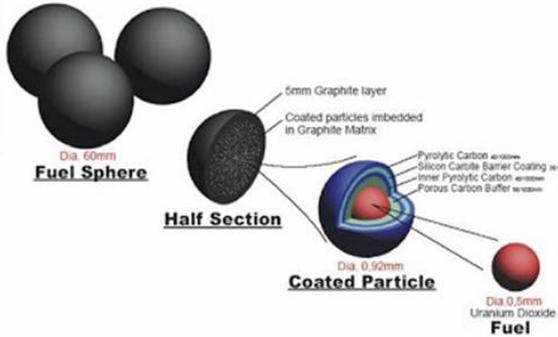
Nuclear Materials Processing for the Nation at H Canyon



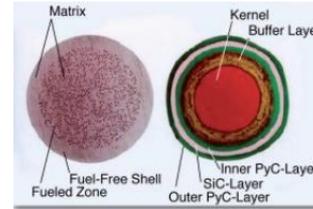
- High assay low enriched uranium initiative to realign H-Canyon mission
- Actinide alloying and electrolytic dissolution processes for Japan's FCA (fast critical assembly facility) plutonium metal disposition
- ORNL reactor fuel assemblies



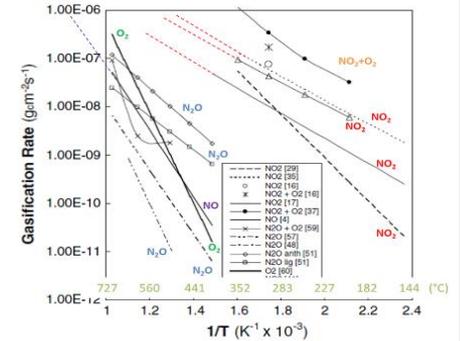
Future Nuclear Materials Processing: German Fuel Spheres



Recovery and/or Disposition of Graphite Based Fuel



Innovation in graphite digestion process (U.S. Patent 9,793,019)



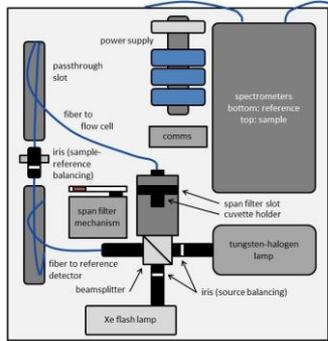
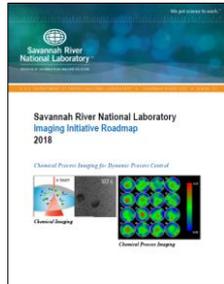
Joint project with Germany – technology maturation program



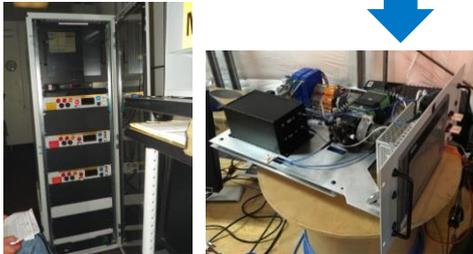
Investment in Emerging Competencies Beginning to Pay Off

High Precision and Accuracy Spectrophotometers for Process Analysis

Process Imaging

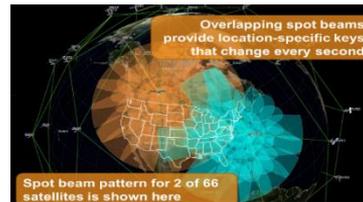
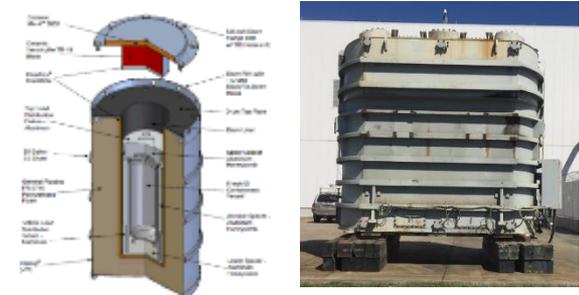
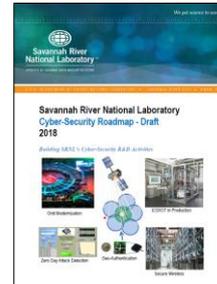


Critical technology for improving production performance and reducing cost/duration of nuclear materials processing campaigns



Cyber-physical threats and attacks: Precise Timing and Grid Resiliency

Cyber

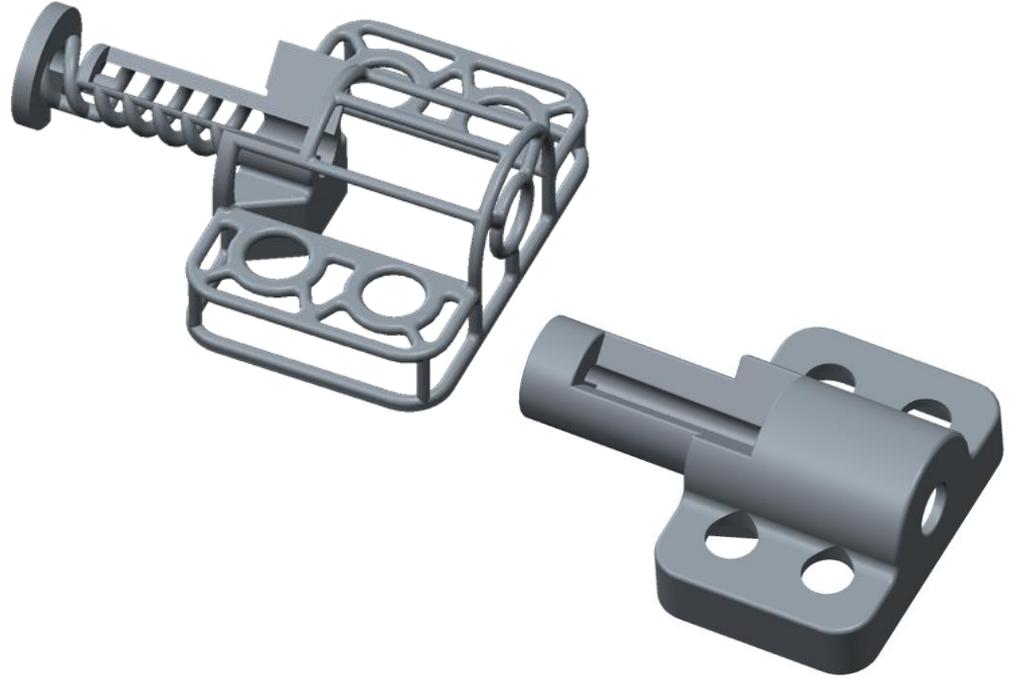


Innovative technology and a one-of-a-kind test-bed facility for securing our national defense and critical infrastructures

Savannah River National Laboratory Delivers Savings With 3D Printing



SRNL replaced a \$4,000 conventionally machined prototype with a \$50 3D printed part for the air flow assembly for its Aerosol Contamination Extractor.



Printing the metal borescope standoff used only the amount of material needed (top) versus “subtractive manufacturing” that creates waste (bottom).



Solving Global Problems

How the wrong cat litter took down a nuclear waste repository

Savannah River National Laboratory chemist David T. Hobbs investigated a radiological accident that closed the Waste Isolation Pilot Plant (WIPP) near Carlsbad, N.M. for three years.

By Jessica Morrison

David T. Hobbs is an expert in the complicated chemistry of nuclear waste management. He's studied nuclear waste materials, radiochemical separations, and complex chemical environments for more than three decades. But three years ago, when an **accident in a New Mexico repository** brought disposal of U.S. defense nuclear wastes to a standstill, he was called to investigate a different kind of material—cat litter.

Hobbs, who doesn't own a cat, is one of the researchers who studied the nuclear waste mixture that in 2014 led to a drum failure and radiological release at the Waste Isolation Pilot Plant (WIPP) near Carlsbad, N.M. The accident shut down the facility for three years. It was ultimately traced to an unorthodox solvent, an organic

What next for Fukushima?

Courtesy: Public Health England/Science Photo Library

09 Jan 2018

Nearly seven years after a powerful tsunami caused catastrophic damage, Japan's Fukushima Daiichi nuclear-power plant, the clean-up and recovery is

Caribbean region becomes free of highly enriched uranium - UN atomic watchdog



IAEA Director General Charles ElBaradei (left) and Mohamed ElBaradei, Deputy Director General, at the IAEA headquarters in Vienna.

DOE lab unveils 'game-changing' storage technology for solar thermal

BY GREGORY ROBERTS

An Energy Department laboratory has developed a "game-changing" heat storage technology that lab researchers say could make solar thermal price-competitive with fossil fuels for round-the-clock power supply and significantly cheaper than existing photovoltaic battery systems.

The Savannah River National Laboratory (SRNL), in Aiken, S.C., also announced January 26 that it has licensed its high-performance metal hydride-based thermal energy storage technology for concentrating solar power (CSP) systems to United Sun Systems (USS), a small Swedish solar thermal technology company.

expenses and long lead times for permitting and construction of their huge mirror arrays, which focus sunlight on central steam generators to drive power-producing turbines.

However, SolarReserve and a few other CSP developers have gotten a competitive advantage over PV plants by outfitting their plants with molten salt storage, which enables them to produce power after the sun goes down—and capitalize on premium electricity prices seen in many regions in the evening when home power use soars.

PV producers are also pursuing storage by co-locating lithium-ion batteries at their plant sites, and utility-scale batteries also are being deployed in the grid by independent storage companies to maximize the value of

this renewable energy source cost-competitive with fossil fuels," SRNL Director Terry Michaelson said in a news release.

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

The Savannah Lab has not described the technology in a peer-reviewed scientific paper, a spokesman said.

A SolarReserve spokesman said in an email that the company welcomes advances in storage technology, and that it too works with DOE on research and development. In 2016, SolarReserve announced plans for a 2,000-MW CSP plant in Nevada that would rank as the

WATCH: 2018 Nuclear Posture Review tailored to 21st century threats

Food News - Friday, February 16, 2018

BROOKINGS NOW

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In early February, the U.S. Department of Defense issued its 2018 Nuclear Posture Review (NPR), the Pentagon's statement of U.S. nuclear policy and capabilities. The NPR, mandated by Congress, was last issued during the Obama administration in 2010.



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