

Facts



● H Canyon

Located at the U.S. Department of Energy's (DOE) Savannah River Site (SRS), H Canyon is the only hardened nuclear chemical separations plant still in operation in the U.S. The facility's operations historically recovered uranium-235 (U-235) and neptunium-237 (Np-237) from aluminum-clad, enriched-uranium fuel tubes from Site nuclear reactors and other domestic and foreign research reactors using a chemical separations process.

In addition, H Canyon was equipped with capabilities to recover Np-237 and plutonium-238 (Pu-238) from special irradiated targets. Pu-238 was produced by irradiating recovered Np-237 in SRS nuclear reactors. Pu-238 was then recovered and used in 30 of the National Aeronautics and Space Administration's deep space exploration programs, such as the Cassini spacecraft.

In 1992, DOE concluded that recovery of enriched uranium for reuse in weapons programs was no longer necessary because of the reduction in the nation's nuclear weapons stockpile. However, there was an inventory of highly enriched uranium fuels (HEU) and solutions in various stages of the SRS process. Through the remainder of the 1990s, DOE issued a series of decisions to resume chemical separation operations to stabilize and manage most of the remaining inventory of HEU materials at SRS, including the Np-237 stored in H Canyon and a number of plutonium solids that were stored in F Area vaults. The resulting HEU and Np solutions were stored until a disposition path could be determined.

In March 2003, the HEU Blend Down campaign began, which provided the capability to blend down the HEU solution that was being stored with natural uranium (NU) to form 4.95 percent U-235 low enriched uranium (LEU). In July 2003, the first LEU shipment was sent offsite to convert the LEU to fuel for use in Tennessee Valley Authority (TVA) power reactors to generate electricity. To date, approximately 22.7 metric tons of HEU has produced approximately 301 metric tons of LEU. This equates to fulfilling the electrical needs for every home in the United States for more than 52 days.



H Canyon was constructed in the early 1950s and began operations in 1955. The interior of the building resembles a canyon because the processing areas resemble a gorge in a deep valley between steeply vertical cliffs. It is 1,028 feet long, 122 feet wide and 71 feet tall, with several levels to accommodate the various stages of material stabilization, including control rooms to monitor overall equipment and operating processes, equipment and piping gallery for solution transport, storage, disposition and unique overhead bridge cranes to support overall process operations.

To minimize worker radiation exposure, work in the canyon, including maintenance, is remotely performed by overhead bridge cranes. The six-foot thick, dense concrete walls that separate workers from the actual processing areas provide added protection.

From 2006 to 2008, H Canyon completed processing of the neptunium solutions to make them ready for oxidation in the HB Line. This is the last neptunium inventory in the United States, a critical asset for future production of Pu-238 and space exploration. The last of the neptunium inventory was converted to an oxide and shipped to Idaho National Laboratory (INL) in November 2008.

In May 2006, DOE approved the Enriched Uranium Disposition Program, which uses the H Canyon facilities for disposition of the large inventory of used nuclear fuel (UNF) from foreign and domestic research reactors and excess enriched uranium and plutonium bearing materials across the DOE complex. This supports both the DOE environmental cleanup and nuclear nonproliferation goals, reduces the footprint and costs associated with maintaining the various DOE sites, and allows for the recovery of enriched uranium for blend down into LEU fuel. Since this mission was approved, H Canyon has successfully dispositioned non-UNF materials from Y-12, Los Alamos National Laboratory and Lawrence Livermore National Laboratory.

In 2011 the Secretary of Energy determined that no processing of aluminum-based UNF would occur in H Canyon until the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future were issued and evaluated by DOE. While awaiting future decisions, H Canyon completed the current TVA Agreement and transferred the remaining LEU solutions offsite in 2011.

H Canyon continues to receive sample returns from the Savannah River National Laboratory and the F Area Analytical Laboratories and disposition the samples to the liquid waste system; and continues to remediate large boxes of transuranic waste such that it can be safely shipped to the Waste Isolation Pilot Plant for final disposition. TRU waste consists of solid materials, such as clothing, tools, rags, residues, debris and other items contaminated with trace amounts of plutonium.

With the implementation of Enterprise•SRS in late 2011, H Canyon was selected to support several potential mission initiatives. While many of the new campaigns are in the planning phase, H Canyon, in conjunction with HB Line, has been selected to begin dissolving and purifying a quantity of SRS excess plutonium to provide the initial feed material to the Mixed Oxide Facility. H Canyon will also dissolve and dispose of vulnerable sodium experimental reactor fuel, while also testing to support NNSA's Next Generation Safeguards Initiative. Investment in H Canyon staffing and infrastructure will support new missions through at least 2020.



Blended uranium solution leaves H Area, bound for Tennessee, where it is converted into fuel for TVA power reactors.