

Facts

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● HB Line

The Savannah River Site's (SRS) HB Line is located on top of H Canyon and is the only chemical processing facility of its kind in the Department of Energy (DOE) Complex. The facility was built in the early 1980s to support the production of plutonium-238 (Pu-238), which is a power source for the nation's deep space exploration program, and to recover legacy materials stored in H Canyon.

HB Line has three process lines. Phase I is the Scrap Recovery processing line. Phase II is the production line for plutonium and neptunium oxides. Phase III was originally the Pu-238 Oxide Production Line, but is now used to prepare excess plutonium and uranium materials for disposition. As required by law, disposition paths are identified for all nuclear materials brought to H Canyon.

Phase I, also called the Scrap Recovery Line, became operational in the late 1980s and was used to dissolve and dispose of legacy plutonium materials. It was also used to dissolve legacy uranium for blending into low enriched uranium to be shipped to the Tennessee Valley Authority for fabrication into commercial power reactor fuel. The Phase I process converted solid nuclear materials into nitrate solutions and transfers those solutions to H Canyon for disposition. HB Line has successfully dispositioned materials from SRS, Lawrence Livermore, Hanford, Rocky Flats and Y-12 through Phase I. In 2011, the DOE directed the facility to cease chemical processing in Phase I and utilize the gloveboxes to perform dry blend-down of high impurity plutonium oxide for disposal at the Waste Isolation Pilot Plant in New Mexico. To date, over 170 containers of blended material have been packaged in HB Line for future shipment to WIPP.

Phase II, which is the Neptunium-237 (Np-237)/Plutonium-239 (Pu-239) Oxide Line, can produce oxide (powder) material from Np-237 or Pu-239 nitrate solutions. Phase II started operations for the first time in November 2001. The Pu material was shipped to FB Line for packaging in 3013 containers for long-term storage, and then to K Area for interim storage. The Np material has been shipped to the Idaho National Laboratory for further processing and conversion to reactor targets for future Pu-238 production and space exploration. Since startup, approximately 325 kilograms of neptunium oxide have been shipped. All neptunium materials have now been completed.



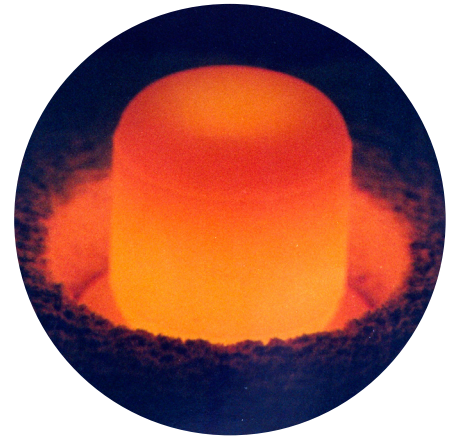
An operator works in the HB Line control room.

Pu-238 has a unique combination of high heat output and long life, allowing designers to keep weight at a minimum and still have a power supply that is effective for many years. Where solar power is not practical, National Aeronautics and Space Administration uses Pu-238 as a heat source in radioisotopic thermoelectric generators. These convert heat to electrical power to operate various deep space vehicles, such as Galileo, Ulysses, Cassini, and more recently, the New Horizons mission to Pluto. Small heat generators have also been used to keep the axle lubricant of the Martian Rovers from freezing.

Currently, Phase II process equipment is being upgraded and tested to support plutonium oxide production, feed material for the Mixed Oxide facility, which is expected to start up in fiscal year 2013.

Other Enterprise•SRS initiatives taking place at HB Line include continuing to process and package plutonium that does not meet MOX feed material specifications. The packaged waste is being safely transported to WIPP. In addition, the Savannah River National Laboratory is providing research and development support using vacuum salt distillation to potentially create additional MOX feed from non-MOX material.

Phase III has been converted into a processing facility to open storage containers when necessary, and oxidize metals to allow for them to be dissolved in the Phase I process area or the H Canyon dissolvers. Phase III is specially equipped to support the preparation and repackaging of excess plutonium and uranium metals and oxides in various forms and packaged in various containers and configurations. Phase III will be used during 2012 to receive, unload and repackage plutonium metal into dissolvable cans for H Canyon in support of MOX.



Pu-238 is a power source for the nation's deep space exploration program.