Savannah River Site

Citizens Advisory Board

Recommendation 235

Nuclear Materials Stabilization – H-Canyon and HB-Line

Background

H Canyon is the only hardened nuclear chemical separations plant still operational in the United States. The facility's operations historically recovered uranium-235 (U-235) and neptunium-237 (Np-237) from aluminum-based enriched-uranium fuel tubes from site nuclear reactors and other domestic and foreign research reactors using a chemical separations process. In addition, HB Line is located on top of H Canyon and is the only chemical processing facility of its kind in the DOE complex. The HB-Line facility was built in the early 1980s to support the production of plutonium-238 (Pu-238), a power source for the nation's deep space exploration program, and to recover legacy materials stored in H-Canyon.

H Canyon was constructed in the early 1950s and began operations in 1955. The building is called a canyon because of its long and tall rectangular shape. It is 835 feet long 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, and disposition, and unique overhead bridge cranes to support overall process operations. All work is remotely controlled, and employees are further protected from radiation by thick concrete walls (Ref. 1).

Comments

As a 2006 priority item for the Nuclear Materials Committee, the adequate and sustained funding to continue the utilization of H Area's capability for any new missions is a major concern to the Savannah River Site (SRS) Citizens Advisory Board (CAB). The future mission or eventual shutdown of H-Canyon is dependent, in part, on a determination of the need for H-Canyon to stabilize and/or disposition any additional materials from the DOE complex (Ref. 2).

H-Canyon is able to dissolve and process significant quantities of enriched uranium including material that is up to 93% U-235. H Area can also handle plutonium and uranium oxides, metals/pellets, and neptunium targets. The SRS CAB recognized the unique capabilities of H-Canyon back in 1999 and recommended that it be retained in an operational status as a process for future stabilization missions (Ref. 3). The unique capabilities for reprocessing and treatment of spent fuels in H-Canyon was also identified in the 2005 National Research Council report on characterization and treatment of radioactive wastes (Ref. 4). The Defense Nuclear Facilities Safety Board (DNFSB) has also voiced its support of H-Canyon as a national resource (Ref. 5).

The SRS CAB addressed the issue of reprocessing spent fuel in H- Canyon in 2004 and recommended that H-Canyon remain operational until treatment and storage for spent nuclear fuel and plutonium disposition becomes operational (Ref. 6). The SRS CAB understands that this operational state may require funds ranging from $50 million to keep it in a safety

readiness state to potentially $200 million to sustain operations. However, with the current missions ending in 2007, the SRS CAB believes the facilities at H-Canyon and HB-Line need to stay viable and available for future missions across the DOE complex.

Recommendation

The SRS CAB has not changed its stance on the importance and continued operation of H-Canyon and like the DNFSB, considers H Canyon a national resource. The SRS CAB recommends that:

1. DOE aggressively pursue alternatives to keep the H-Area assets (people and equipment) actively conducting risk reduction, such as stabilizing and dispositioning legacy nuclear materials.

2. DOE provide timely updates on potential missions for H-Canyon and HB-Line.

References

1. SRS Nuclear Materials Stabilization – Past, Present, Future, presentation to the Nuclear Materials Committee by Ron Oprea, WSRC, June 20, 2006.

2. Nuclear Materials Committee 2006 Work Plan, April 5, 2006.

3. Citizens Advisory Board Recommendation No. 100 (adopted September 28, 1999), "Canyon Utilization and spent Nuclear Fuel Melt and Dilute Technology."

4. “Improving the Characterization and Treatment of Radioactive Wastes for the Department of Energy's Accelerated Site Cleanup Program”, National Research Council, 2005.

5. Letter from Chairman, DNFSB to Spencer Abraham, Secretary of Energy, March 21, 2002.

6. Citizens Advisory Board Recommendation No. 195 (adopted July 28, 2004), “Receipt of Spent Nuclear Fuel at SRS”.

Agency Responses
Department of Energy-SR