U.S. Highly Enriched Uranium (HEU) Disposition—Overview

Office of Fissile Materials Disposition

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U.S. Surplus HEU Disposition Paths

Down Blending Agent: USEC

U.S. Surplus Highly Enriched Uranium (HEU)

- Disposition Completed
- Disposition In Progress
- Disposition Proposed to Begin 2006
- Disposition Not Yet Determined
- Disposition as Waste (not commercially usable)

**Total = 174 MT**

**UF₆**
- **14 MT**
- **1994**

**U.SEC/BWXT**
- **U.SEC Transfer Material**
  - **50 MT**
  - **1998 - 2006**

**TVA Off-Spec Material**
- **39 MT**
- **2002 - 2016**

**SRS/NFS**
- Research Reactor Fuel Feed
- **10 MT**
- **2002 - 2016**

**Y-12**
- **Unallocated Off-Spec Material**
  - **14 MT**
  - **2010 - 2016**
- **Y-12 IAEA Replacement Material**
  - **15 MT**
  - **2006 - 2010**
- **Unallocated On-Spec Material**
  - **9 MT**
  - **2010 - 2016**

**Spent Fuel & Waste**
- **23 MT**
- **TBD**

**Dispose as waste at high-level geologic waste repository or low-level waste facility**

**Future Declarations**

Sales subject to Secretarial determination of “no adverse material impact” on domestic uranium industries

**TBD**
USEC HEU Transfer Project

- 50 MT of surplus U.S. HEU is being transferred to USEC for downblending (mandated by USEC Privatization Act).

- Approximately 40 MT of HEU have been delivered to USEC’s downblending contractor, BWXT-NPD, thus far, and ~34 MT have been downblended and delivered to fuel fabricators.

- The final shipments of material to BWXT are scheduled for early 2006.
Off-Spec (“BLEU”) Fuel Program

• DOE-TVA Interagency Agreement covers 39 MT of “off-spec” HEU.
  – 6 MT added in 2004
  – To be used in Browns Ferry 2 & 3
• Downblending at SRS and NFS
• New facilities built by AREVA and NFS
  – Uranyl Nitrate Building (AREVA, Erwin)
  – Oxide Conversion Facility (AREVA, Erwin)
  – Pelletizing Facility (AREVA, Richland)
  – BLEU Prep Facility (HEU recovery and downblending) (NFS, Erwin)
  – All are operational
Off-Spec HEU Project Status

• 7.1 MT of HEU (avg. 64% enrichment) have been downblended to 105 MT of 4.95% LEU (~216,000 gallons of solution) at SRS.

• Down blending of HEU at the BLEU facility in Erwin, TN began in December 2004.

• ~46 MT of LEU oxide have been produced at AREVA Erwin and shipped to AREVA Richland.

• ~46 MT of fuel pellets, 21,560 fuel rods, and 280 fuel assemblies have been produced at Richland.

• Shipments of completed BLEU assemblies to Browns Ferry began December 2, 2004 and were completed January 23, 2005.

• All assemblies for the Spring reload at Browns Ferry Unit 2 have been delivered to the plant, and receipt inspections are near completion.
Foreign Research Reactor
Low-Enriched Uranium (LEU) Fuel

DOE/NNSA and Russia are the only two suppliers of enriched uranium for use in research reactors

- U.S. surplus HEU (10 MT) is source material to make LEU fuel (mostly 19.75% enrichment).

- Material provided in support of the Reduced Enrichment for Research and Test Reactor (RERTR) program

- Customers in Europe, Canada, Asia, South America, Australia
New Project: IAEA Replacement HEU

• ~10 MT of high assay surplus HEU has been under International Atomic Energy Agency (IAEA) safeguards at Y-12 National Security Complex since 1994.

• The facility where it is stored is to be decommissioned about 2010 to enhance security and reduce costs at Y-12. The IAEA-safeguarded HEU must be removed by that time.

• The Office of Fissile Materials Disposition and Y-12 Site Office in early October issued a Request for Expressions of Interest (EOI) in the sale and downblending of 15-17 MT of surplus HEU.
IAEA Replacement HEU (cont.)

• The material is not the IAEA-safeguarded material, but rather other surplus (formerly “unallocated on-spec”) HEU, to be delivered for downblending over 2006-09.

• Material must be downblended subject to an IAEA safeguards regime on the downblending process.

• The IAEA-safeguarded downblending will substitute for the IAEA safeguards on HEU in storage at Y-12.
IAEA Replacement HEU (cont.)

- As material is downblended, equivalent quantities of the safeguarded HEU at Y-12 will be withdrawn from safeguards and transferred back into the national security inventory for use as naval reactor fuel feedstock.

- Replacement material is somewhat lower assay, but significantly higher quantity.

- IAEA has been briefed on and accepts this plan.

- Many positive responses to the EOI have been received.

- DOE must complete a Secretarial determination of impacts on the uranium industry.

How Are We Doing Overall?

The HEU Disposition Program will forever remove the HEU equivalent of nearly 4,300 weapons from the U.S. nuclear stockpile. The HEU equivalent to about 1200 weapons has been eliminated to date.