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Implementation of the United States-Russian Highly Enriched Uranium Agreement: Current Status and Prospects (slides)

Ed Rutkowski, Guy Armantrout, Edward Mastal, Joseph Glaser, Janie Benton

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Disclaimer

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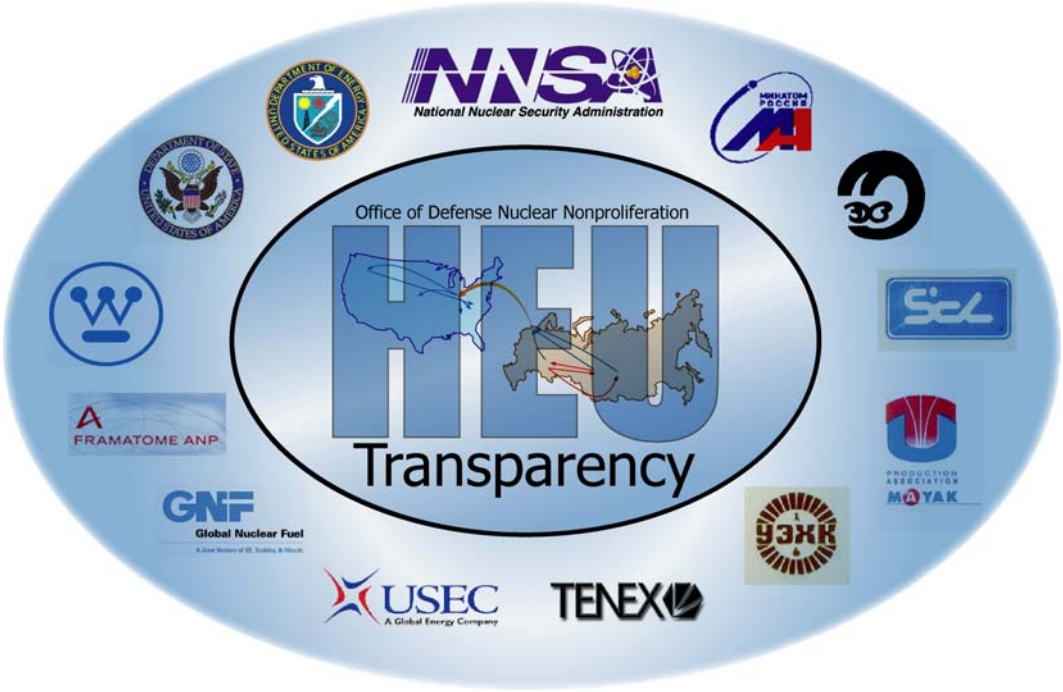
Implementation of the United States/Russian HEU Agreement: Current Status and Prospects



Edward F. Mastal, Joseph Glaser, and Janie Benton
U.S. Department of Energy, National Nuclear Security Administration

Ed Rutkowski
Lawrence Livermore National Laboratory

Institute of Nuclear Materials Management
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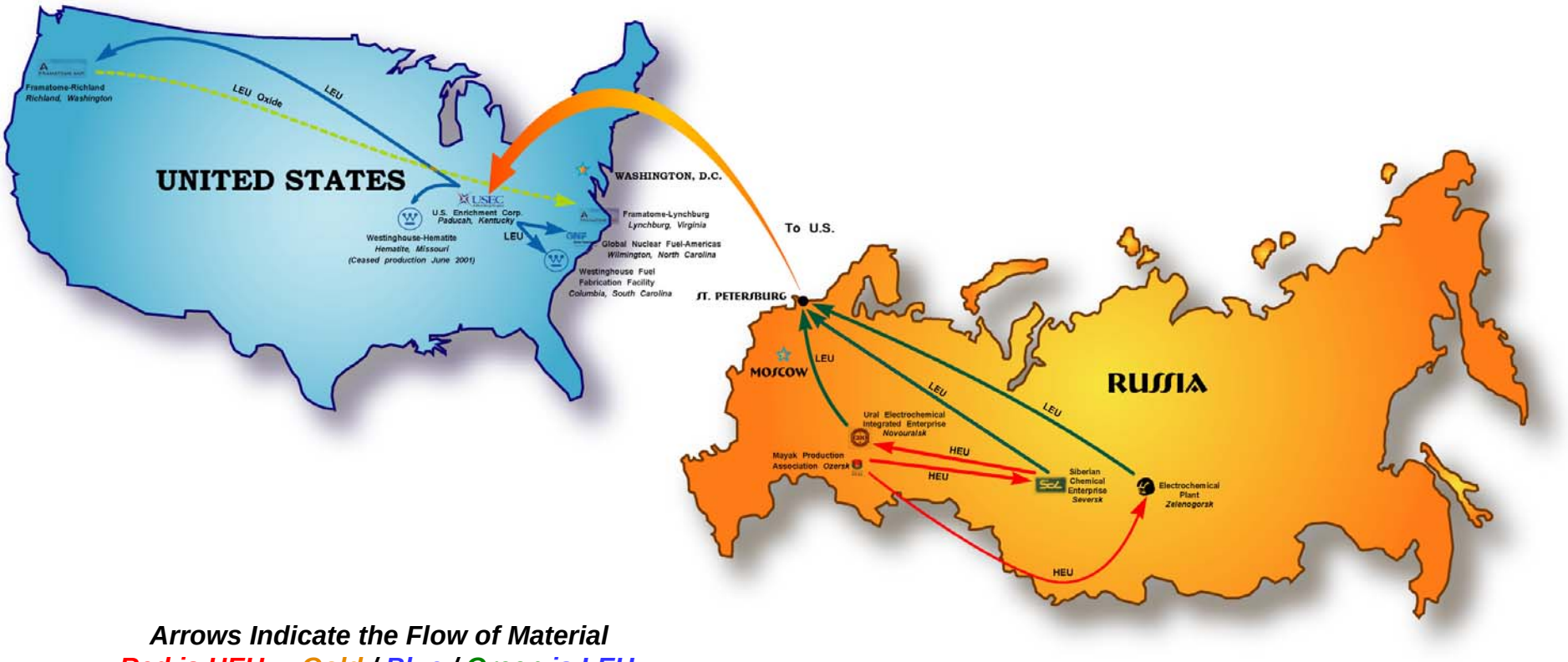
Transparency Objectives

- The 1993 HEU Purchase Agreement requires a Transparency program in order to enable receipt of Russian origin LEU in the U. S.
- Transparency now includes:
  - Declaration of all process operations subject to the agreement
  - Providing material movement and accountability documentation
  - Defining process spot-checking and independent measurement procedures
- We are building trust
  - Recognize mutual interests for non-proliferation
  - Recognize each countries security concerns as an element of Transparency
    - In fact, Trust is a major element in the Transparency Program

Facilities Subject to the Agreement



Arrows Indicate the Flow of Material
Red is HEU Gold / Blue / Green is LEU

HEU Transparency Assures the U. S. that:

Objective One

500 MT is from Russian weapons-usable material.

Tactical nuclear device

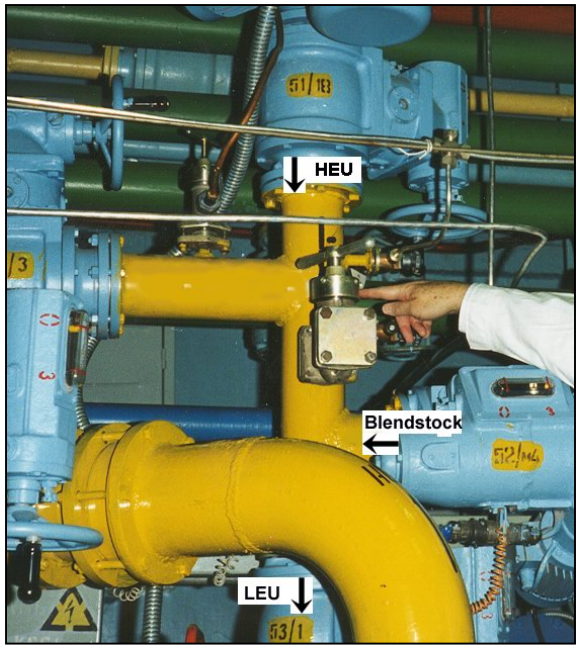
Objective Two

This same HEU is converted to an oxide.

Russian facility glove box where HEU metal is burned and converted into oxide

Objective Three

This same HEU is downblended to LEU.



HEU Blendpoint in Russian Plant

HEU-TIP Monitoring Activities Assure Nonproliferation Objectives are Met

Process Spot Checking MC&A records

Two U.S. monitors staff the Transparency Monitoring Office (TMO) at UEIP.

Independent Measurements

U.S. Blend Down Monitoring System (BDMS) at three Russian plants that blend HEU into LEU:

- UEIP (Installed in January 1999)
- ECP (Installed in March 2003)
- SChE (To be installed in October 2004 and certified in February 2005)

New portable nondestructive assay (NDA) instrumentation is used at the four plants to assure 90% ^{235}U assay of HEU in processing operations.

Process Spot Checking

US monitors annually conduct up to 24 Special Monitoring Visits (SMV) to the four Russian plants.

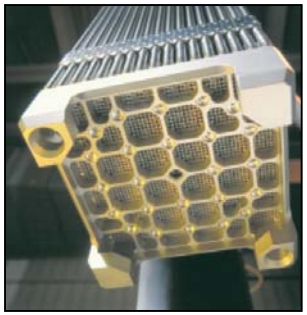
Independent Measurements

Russian Monitoring in the United States Supports Nonproliferation Objective Number Four

Objective Four

The LEU shipped to the United States <u>is</u> <u>fabricated into fuel</u> for commercial nuclear reactors.

Nuclear fuel rod assembly



Russian monitors at the Paducah Gaseous Diffusion Plant observing NDA test on LEU cylinder from Russia

US and Russian monitors at Framatome-Lynchburg

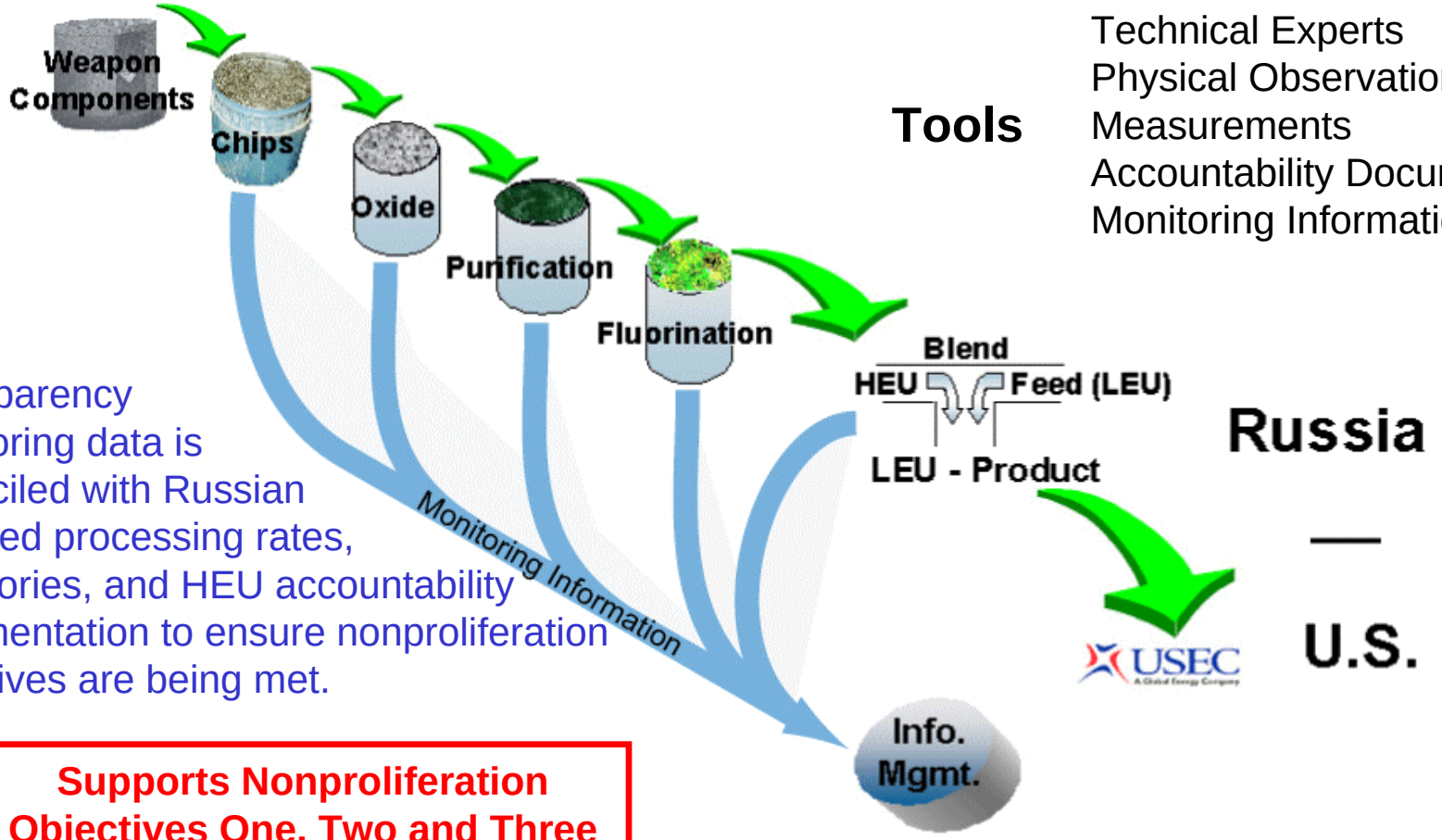
- **HEU-TIP monitors provided coordination and accompanied Russian monitors during their Oct. 2003 transparency monitoring visits to U.S. facilities.**
  - **USEC Gaseous Diffusion Plant, Paducah, KY (Familiarization visit only)**
  - **Framatome-Lynchburg, Lynchburg,VA**
  - **Westinghouse Nuclear Fuel, Columbia, SC**
- **Three additional U.S. fuel fabricators are subject to monitoring by Russian Federation:**
  - **Framatome-Richland, Richland, WA**
  - **Global Nuclear Fuel-Americas, Wilmington, NC**
  - **Westinghouse-Hematite*, Hematite, MO**

US and Russian monitors in the LEU cylinder yard at Westinghouse Nuclear Fuel

*** Ceased fabrication operations in 2001.**

Transparency Process

Monitors gather data on material processing rates and material containers in Russian plant storage and process areas.



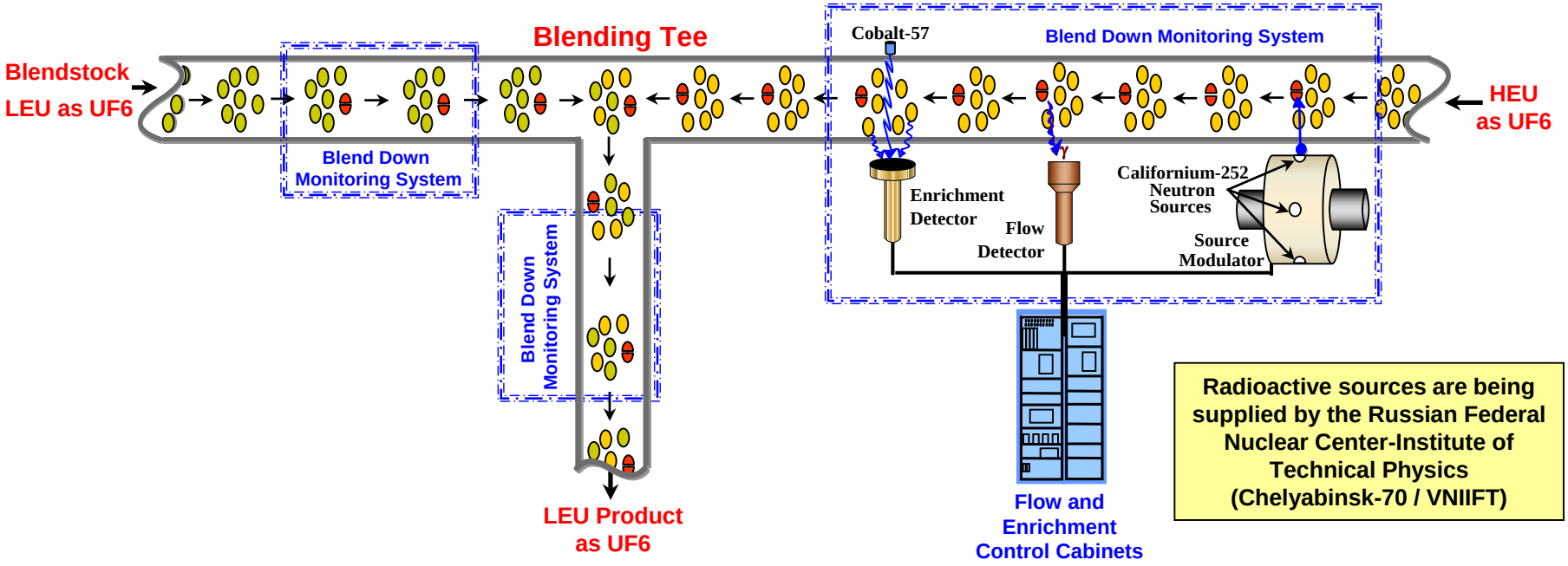
Tools

Technical Experts
Physical Observations
Measurements
Accountability Documents
Monitoring Information

Transparency monitoring data is reconciled with Russian declared processing rates, inventories, and HEU accountability documentation to ensure nonproliferation objectives are being met.

Supports Nonproliferation Objectives One, Two and Three

The Blend Down Monitoring System (BDMS) is an Important U.S. Independent Measurement



BDMS

- Measures HEU and product flows and enrichment with U. S. instrument
- Measurements are then compared with Russian enrichment and MC&A data
- Excellent agreement to date has provided strong assurance to the U. S.

The BDMS is Now Operating at Two Russian Processing Plants

UEIP

ECP

The BDMS confirms the enrichment assay, flow and traceability of the HEU being blended into LEU.

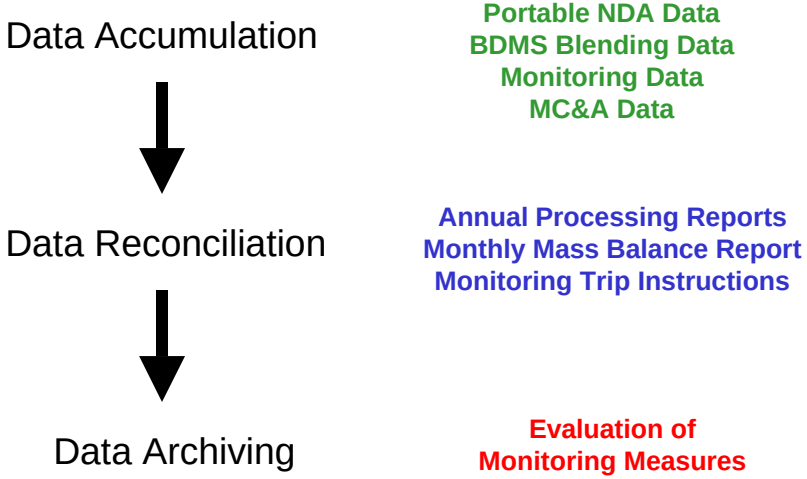
BDMS will be Installed at SChE This Year

Training for SChE plant personnel took place in May 2004 in Oak Ridge, TN

DATA Management and Exchange

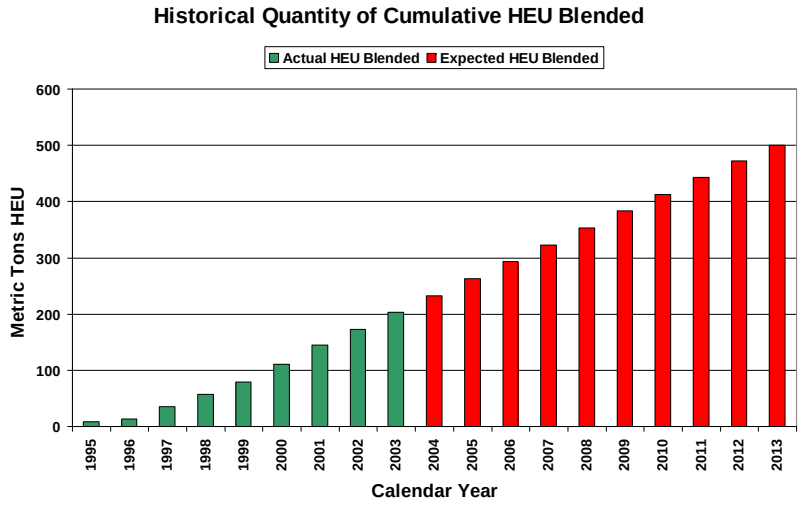
- A secure computer system connects 14 U.S. sites to a centralized data resource and assures secure inter-site communication to protect data obtained from Russian sites.
- Provides version control and security for transparency data that is used for data reconciliation at various sites.

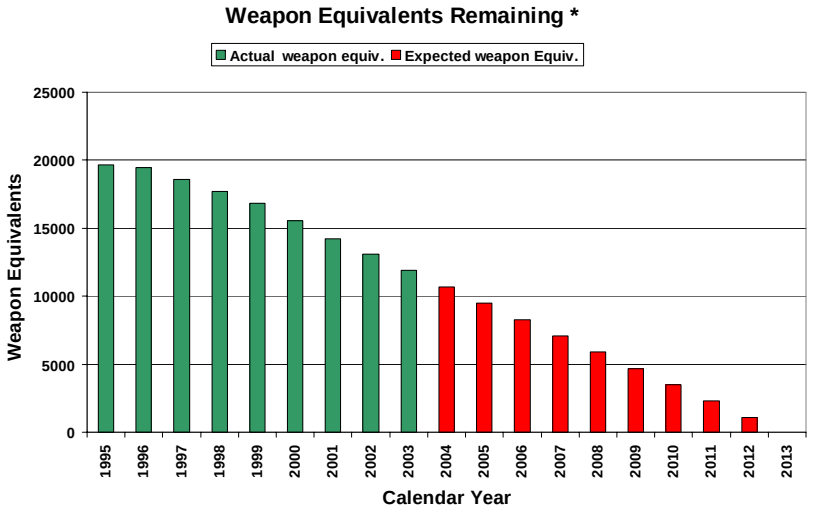
Allows U. S. to reconcile observations and measurements with Russian declarations



Russian HEU Converted

- 43% of the HEU is now LEU -





- **Through June 2004, HEU-TIP will have monitored the conversion and blending of about 217 MT of HEU used to produce the LEU delivered to USEC.**
- **217 MT of HEU is equivalent to 8,670 nuclear devices*.**
- **Russia will have delivered a total of 6,377 MT of LEU containing over 39 million SWU and 65 thousand MT of natural uranium.**
- **By the end of CY 2003, MINATOM received over $4 billion and about 25,000 MT of natural uranium feed.**

30 MT HEU Annual Conversion Rate (2000-2013)

*** Per IAEA standard for significant quantity of nuclear material**

In Closing

- A viable transparency program has been successfully implemented that enables the HEU Purchase Agreement to proceed.
- The HEU-TIP is a robust and mature program supported by five DOE field offices and seven major DOE laboratories.
- Cooperation between the United States and the Russian Federation has resulted in unprecedented success of our joint transparency activities to support the nonproliferation objectives of the HEU Purchase Agreement.
- Continued cooperation and mutual respect enables us to translate innovation and ideas into practical solutions for meeting global nuclear nonproliferation objectives.

Annual deliveries of LEU blended from 30 MT of weapons-grade HEU is equivalent to about one-half of the annual U.S. nuclear fuel requirement, or about ten percent of the total electricity generated in the United States.