

U.S. Policy Objectives for HEU Minimization

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Outline

- President Obama's 2009 Prague Speech
- Nuclear Security Summit Objectives
- HEU Removals & Downblending
- Research Reactor Conversion
- Non-HEU-Based Molybdenum-99 Production

President Obama in Prague



“So today I am announcing a new international effort to secure all vulnerable nuclear material around the world within four years.”

- *President Obama, Prague, April 2009*

The President and his Administration are highly focused on nuclear security and preventing nuclear terrorism

Nuclear Security Summit

April 2010



- President Obama hosted 46 other countries and 3 international organizations
 - Discussion on important steps that the world can take to increase nuclear security and reduce the chances that terrorists would steal nuclear material
- A Communiqué was issued and all countries signed up to a Work Plan, which included commitments to minimize the use of HEU in civilian applications

Minimizing HEU Use is a Key Nuclear Security Summit Commitment

Minimizing the use of HEU in civilian applications:

- Participating States, where appropriate, will consider on a national basis the safe, secure and timely removal and disposition of nuclear materials from facilities no longer using them;
- Participating States will consider, where appropriate, converting highly-enriched-uranium fueled research reactors, and other nuclear facilities using highly enriched uranium, to use low enriched uranium, where it is technically and economically feasible;
- Participating States, as appropriate, will collaborate to research and develop new technologies that require neither highly enriched uranium fuels for reactor operation nor highly enriched uranium targets for producing medical or other isotopes, and will encourage the use of low enriched uranium and other proliferation-resistant technologies and fuels in various commercial applications such as isotope production



HEU Fuel Removals & Downblending

- **HEU Removals**

- All HEU material has been removed from 19 countries.
- Since the Nuclear Security Summit in April 2010, GTRI has worked with international partners to remove over 400 kilograms of highly enriched uranium (HEU) from civilian sites in 10 countries. This is enough HEU to make more than 16 nuclear weapons.

- **Downblending Programs**

- The United States has committed to downblend 182 tons of excess HEU and have already completed the downblending of 137 tons.
- The United States has also helped Russia to eliminate 500 tons of its excess HEU by agreeing to purchase LEU that resulted from its blend down.
- These steps support the ultimate goal of irreversibility in the process of nuclear disarmament, a principle agreed at the 2000 and 2010 NPT Review Conferences.

Research Reactor Conversions

- 77 out of approximately 200 HEU-fueled facilities worldwide have been converted or verified as shutdown.
- **Domestic:**
 - NRC 10 CFR 50.64 “Limitations on the use of highly enriched uranium (HEU) in domestic non-power reactors” issued Feb. 25, 1986.
 - All U.S. HEU research reactors that can convert with existing LEU fuels have now been successfully converted to the use of LEU fuel.
 - Efforts to develop a new LEU fuel for the remaining HEU-fueled facilities in the United States is ongoing.
- **International:**
 - The United States is continuing to work with international partners to convert HEU-fueled research reactors worldwide to existing LEU fuel.
 - The United States is also working closely with international partners to develop a new LEU fuel for the remaining HEU-fueled research reactors that cannot convert using existing LEU fuel.
 - Technical and economic feasibility studies for the first six Russian research reactor conversions are underway.

Non-HEU-Based Mo-99 Production

- Senate Bill 99 (S.99), which passed the Senate November 17, 2011, strongly supports the Administration's policy objectives and codifies much of the legal path forward.
- The letter to President Obama from Representatives Markey and Fortenberry sent May 2011 expressed concern about HEU use in Mo-99 production and the potential cost differential of LEU-based versus HEU-based Mo-99. A response from NNSA Administrator D'Agostino emphasized:
 - Minimizing the use of HEU in Mo-99 production;
 - Developing non-HEU-based production in the United States;
 - Transitioning the Mo-99 market to full cost recovery; and
 - Establishing U.S. supplies of Mo-99 without HEU within five years.

Conclusions

- The United States appreciates and has been executing the recommendations from the 2006 Oslo meeting, both domestically and internationally, such as:
 - “need for more rapid repatriation, based on contractual agreement, of used and unused HEU fuel to the countries of origin for down blending and reuse”;
 - “technological developments for facilitating HEU minimisation” with an emphasis on international collaboration, both for high density fuel development and qualification efforts; and
 - “production of medical and other isotopes using LEU targets...taking into account technical and economic considerations”
- The United States has been working to identify and implement HEU minimization policies consistent with our commitments that support the development of a favorable environment for the implementation and success of these policies.
- Commitment and action from all our international partners, proportionate with inventory, is needed so to achieve this shared objective.
- HEU minimization, and elimination when possible, remains a key priority of the United States.