

**STATUS OF THE UNITED STATES DEPARTMENT OF ENERGY'S
NUCLEAR FUEL RETURN PROGRAMMES**

**GTRI ACCOMPLISHMENTS AND PLANS FOR REMOVING
AND DISPOSING OF CIVILIAN HEU**

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ABSTRACT

The Global Threat Reduction Initiative (GTRI), National Nuclear Security Administration's Remove Program supports permanent threat reduction by eliminating stockpiles of excess weapons usable nuclear materials located at civilian sites throughout the world. This material, if stolen or diverted, poses a significant risk to U.S. and international security. In response to this potential threat, GTRI started an initiative in 2004 to accelerate efforts to recover U.S. and Soviet-origin highly enriched uranium (HEU) from around the world. GTRI also is working to remove so called "gap" nuclear materials that are outside of the scope of the existing Russian-origin and U.S.-origin HEU recovery program. This paper summarizes the accomplishments and plans for removing and disposing of this highly dangerous material.

INTRODUCTION

Thank you for this opportunity to update you on our efforts under the National Nuclear Security Administration's (NNSA) Office of Global Threat Reduction. Our work under the Global Threat Reduction Initiative (GTRI) to reduce the potential risk posed by vulnerable nuclear material is part of a larger effort by NNSA to respond to the growing concern of nuclear and radiological terrorism. Through GTRI, NNSA has consolidated existing NNSA nuclear material removal efforts into a single NNSA office to maximize the synergy of the mission and leverage our expertise and resources effectively.

GTRI's Remove Program supports permanent threat reduction by eliminating stockpiles of excess weapons-usable nuclear materials from civilian sites, thereby securing it from possible diversion for malevolent purposes. In this paper, I present an introduction to our existing removal programs and highlight some of our recent accomplishments.

RUSSIAN-ORIGIN HEU FUEL REMOVAL

GTRI is working with the Russian Federation and the International Atomic Energy Agency (IAEA) to repatriate Russian-origin highly enriched uranium (HEU) fresh and spent fuel from over 20 Russian-supplied research reactors in 17 countries. This trilateral initiative works hand-in-hand with GTRI's reactor conversion program to ensure that eligible facilities that make their HEU fuel available for repatriation and agree to convert to low enriched uranium (LEU) fuel may receive the necessary assistance. As an incentive to participate in the program, GTRI provides replacement LEU fuel in exchange for HEU fresh fuel that is returned to Russia. HEU fresh fuel removals are conducted under the auspices of the IAEA, whereas HEU spent fuel removals are conducted under contracts with the research reactor facilities.

Removing HEU spent fuel is more complicated than HEU fresh fuel removal and requires additional steps such as:

- Potential facility modifications to accommodate spent fuel transport casks;
- Implementing agreements to provide nuclear liability protection;
- Ecological and environmental review; and
- Shipment by rail and sea instead of air.

In October 2006 an IAEA workshop was held to provide information to countries to assist in their preparations for shipping HEU spent fuel to Russia, including the sharing of lessons learned from the planning, preparation, and conduct of shipments in early 2006 of spent fuel from the Institute of Nuclear Physics in Tashkent, Uzbekistan.

As a result of the Bratislava Joint Statement on Nuclear Security Cooperation issued by Presidents Bush and Putin in February 2005, GTRI has developed an overall prioritized accelerated schedule of shipments. Over the past year, this program has been very successful and we have already repatriated a cumulative 509 kilograms of Russian-origin HEU fuel in 19 shipments from Serbia, Romania, Bulgaria, Libya, Uzbekistan, the Czech Republic, Poland, Germany and Vietnam.

So far in FY2007, GTRI returned to Russia 268 kilograms of HEU fresh fuel from Germany (the largest Russian-origin HEU shipment ever conducted under GTRI), 8.8 kilograms of HEU fresh fuel from Poland, 4.3 kilograms of HEU fresh fuel from Vietnam, and completed preparations for the HEU spent fuel shipment from the Czech Republic.

In FY2008, GTRI is currently planning 8 shipments totaling 350 kilograms of both fresh and spent HEU. GTRI looks forward to additional successes at all levels of the program to meet the goal of the complete repatriation of eligible Russian-origin HEU spent fuel currently stored outside of research reactors by 2010, three years ahead of schedule.

U.S.-ORIGIN HEU AND LEU FUEL REMOVAL

GTRI is also working with other countries to return to the United States, U.S.-origin HEU and LEU spent nuclear fuel and HEU target material from foreign research reactors that agree to convert to LEU. Approximately 20 metric tons of eligible U.S.-origin research reactor spent fuel resides in more than 40 countries.

To date, GTRI has repatriated over 8,000 nuclear fuel assemblies from 27 countries in 40 shipments. During FY2007, GTRI completed shipments of U.S.-origin spent nuclear fuel from several countries, including Australia, Japan, South Korea and Sweden. To date, 13 countries have returned all of their U.S.-origin HEU fuel.

In 2004, DOE approved a ten-year extension of this program to allow continued acceptance and management of eligible U.S.-origin material to be returned to the United States. Under the extension, the United States will accept eligible spent fuel that is irradiated by May 2016 and returned to the United States by May 2019, allowing more facilities to participate in the effort.

GAP MATERIALS PROGRAM

The Gap Materials Program facilitates the disposition of high risk, vulnerable nuclear material not covered by other removal efforts. The materials could include:

- U.S.-origin nuclear materials not covered by existing U.S.-origin fuel return programs,
- HEU material of non-U.S.-origin and non-Russian-origin,
- Separated plutonium and plutonium-bearing material.

The program identifies excess nuclear material that could pose a potential terrorist concern. The materials recovered by the program may be disposed through commercial means or be disposed in the United States. Since the program began, we have removed approximately 100 kilograms of HEU from Belgium, Canada, and the Netherlands under the Gap Materials Program.

EMERGING THREATS PROGRAM

The Emerging Threats program supports advanced planning preparations for denuclearization efforts of comprehensive nuclear development programs. The program provides for in-country stabilization, packaging and removal of nuclear materials and allows for independent, self-sufficient operation. In addition, the program establishes rapid response teams to ensure that when opportunities present themselves, GTRI is able to respond quickly and efficiently.

Under the Emerging Threats Program, NNSA has developed a Mobile Uranium Facility (MUF) and a Mobile Plutonium Facility (MPF). The primary objective of the MUF is to provide for the rapid deployment of a system for safe stabilization, packaging, and expedited transportation of uranium materials in support of GTRI nuclear recovery missions. The primary objective of the MPF is to provide for the rapid deployment of a system for safe stabilization, packaging, and expedited transportation of plutonium materials or other “at risk” materials worldwide. See Figure 1 for a picture of the glove boxes inside of the MPF.

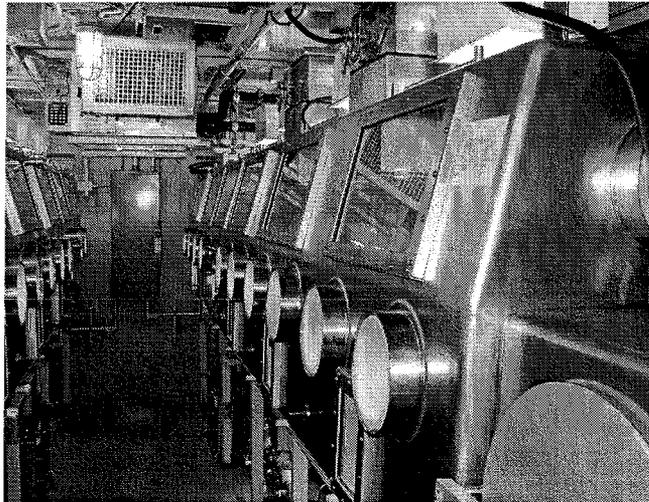


Figure 1 – Glove Boxes Inside the Mobile Plutonium Facility

CONCLUSION

All of GTRI's nuclear removal programs work together to reduce the civil use of HEU and remove high-risk, vulnerable nuclear materials that exist throughout the world. GTRI will continue its efforts to reduce and eliminate the availability of weapons-usable nuclear materials as part of the overall U.S. non-proliferation strategy. Thank you for your time and your continued support.