

# GLOBAL HEU PHASEOUT

## NPPP POLICY RESEARCH PROJECT



## OUR RESEARCH

### Past Successes

- Medical Isotope Production in Argentina
- Reactor Fuel and Isotope Production in South Africa

### Continued Progress

- Civilian HEU Use in China
- FRM-II in Germany
- High-powered Research Reactors in the United States and Europe
- Icebreakers and Floating Reactors in Russia

### Ongoing Civilian HEU Use

- Critical Assemblies in Russia
- Medical Isotope Production in Canada/Russia
- Medical Isotope Production in Belgium and Netherlands
- Research Reactors in Russia

### Ongoing Military HEU Use (non-weapons)

- Naval Propulsion in the United States
- Naval Propulsion in Russia

### Future Applications

- Space Reactors

This year-long Nuclear Proliferation Prevention Project (NPPP) initiative – led by Prof. Alan J. Kuperman and involving 14 University of Texas at Austin graduate students in nuclear engineering and global policy studies – explores the technical and political prospects and challenges of reducing worldwide non-weapons usage of highly enriched uranium (HEU). Most previous research and policy initiatives in this area have focused on the use of HEU as fuel for nuclear research reactors and as targets for production of medical isotopes. Our project updates and broadens the scope of past research to cover all remaining non-weapons usage of HEU, including the following: naval propulsion, ice-breaking ship reactors, floating reactors, critical assemblies, pulsed reactors, research reactors, and isotope production.

The 14 graduate students who participated in the project are: Noboru Akimoto, Jared Berenter, Braden Civins, Chloe Colby, Kenny Dayman, Christine Egnatuk, Alex Fay, Sandra Feng, Margarita Jiminez, Blake Messer, Paul Osborne, Yaroslav Primachenko, Kendra Vessels and Rebecca Ward.

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**The Nuclear Threat Initiative and The University of Texas at Austin**

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## Today's Presentations

We are grateful to AAAS for hosting this event

### Icebreakers and Floating Reactors in Russia

This paper assesses the technical and political feasibility of converting the propulsion reactors of the Russian nuclear icebreaker fleet from HEU to LEU fuel.

**Christine Egnatuk** is a Ph.D. candidate in the Nuclear and Radiation Engineering program at The University of Texas at Austin. She is a DoE/NNSA Nuclear Nonproliferation and International Safeguards Fellow.



### Medical Isotope Production in Belgium and Netherlands

Medical isotope production in Belgium and the Netherlands currently relies on the irradiation of HEU targets, however substantial pressure has been applied to the two producers in these countries to convert operations to utilize LEU targets.

**Alex Fay** is a Ph.D. student in the Nuclear and Radiation Engineering program at the University of Texas at Austin. His current research focuses on the improvement of radioxenon monitoring stations used for verification of the Comprehensive Test-Ban-Treaty.



### Naval Propulsion in the United States

Prospects for the conversion of the United States Navy's nuclear-powered fleet were evaluated in light of the French Navy's conversion to LEU-fueled vessels. The United States Navy opposes such a conversion.

**Rebecca Ward** is a Ph.D. student in the Nuclear and Radiation Engineering Program at The University of Texas at Austin and is supported by the DHS/DoD Nuclear Forensics Graduate Fellowship.



## NPPP

### The Nuclear Proliferation Prevention Project

The NPPP engages in research, debate, and public education to ensure that civilian applications of nuclear technology do not foster the spread of nuclear weapons to states or terrorist groups.



Founding NPPP  
Coordinator  
Alan J. Kuperman

The Nuclear Proliferation Prevention Endowment (NPPE) was created by a gift from the Nuclear Control Institute (NCI) to the University of Texas at Austin and supports the NPPP.

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