



# HEU to LEU Conversion At NRC Licensed Research and Test Reactors

Xiaosong Yin

Project Manager, Division of Policy and Rulemaking  
U.S. Nuclear Regulatory Commission  
301-415-1404, [xiaosong.yin@nrc.gov](mailto:xiaosong.yin@nrc.gov)

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# HEU/LEU Conversion History

- 1984 University of Michigan
- 1986 10 CFR 50.64
- 1986 – 1988: three NUREGs
- A total of 16 research reactor conversions complete

# Pre-conditions Must Be Met

- Available federal funding
- Suitable reactor fuels
- Fuels acceptable to NRC
- Licensee submits conversion proposal



# Upcoming HPRRs Conversions

- MURR
- MIT
- NIST

# High Performance Reactor

- MURR
  - 10 MW research reactor
  - HEU UAlx-Al Plates
  - Thermal Neutron Flux:  
~E+14 n/cm<sup>2</sup>-sec

# High Performance Reactor

- MURR (anticipated after conversion)
  - 12 MW test reactor
  - LEU U-10Mo Plates
  - Maximum Neutron Flux:  
??

# High Performance Reactor

- MIT
  - 6 MW research reactor
  - HEU UAlx-Al Plates
  - Max Thermal Neutron Flux:  
~E+13 n/cm<sup>2</sup>-sec

# High Performance Reactor

- MIT (anticipated after conversion)
  - 7 MW research reactor
  - LEU U-10Mo Plates
  - Transition core
  - Maximum Thermal Neutron Flux: ??



## High Performance Reactor

- NIST (anticipated after conversion)
  - 20 MW research reactor
  - **LEU U-10Mo Plates**
  - **Transition core**
  - Maximum Thermal Neutron Flux:  
from  $\sim E+14$  n/cm<sup>2</sup>-sec to ??

# Challenges

- New fuel design
- Un-precedent process
- Power up-rate
- Transition core
- Environmental review
- Contingency plans if LEU fuel performance failure
- Schedule



# Keys to Success

- Acceptable fuels
- Timely submission of high quality conversion amendment request
- Policy, Regulations, Licensing Guidance

