



HEU to LEU Conversion At NRC Licensed Research and Test Reactors

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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/cm²-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/cm²-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/cm²-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

