MOX Fuel Project Status

NRC - Duke Power – Framatome ANP Meeting
One White Flint North

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Russian Plutonium Disposition

- Late 2002 – U.S.-Russian agreement on basis for Russian plutonium disposition program
  - Russian MOX Fuel Fabrication Facility (R-MFFF) based on design of United States facility
  - Primary use of MOX fuel in VVER-1000 pressurized water reactors
- Goal of starting construction on U.S. and Russian fabrication facilities in 2004
- Issue of liability for western contractors is still unresolved

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United States MFFF

- Construction authorization delayed past 2003 due to change in MFFF Controlled Area Boundary
- Atomic Safety and Licensing Board hearings in 2004
- Begin construction in summer 2004, contingent on
  - Regulatory approval
  - Russian progress
- Produce MOX fuel for McGuire and Catawba ~2009

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U.S. Reactor Use of MOX Fuel

- Lead assembly program
  - Feb 27, 2003 – Duke submitted license amendment request (LAR) for approval to use MOX fuel lead assemblies at McGuire or Catawba
  - September 23, 2003 – Duke amended LAR to apply to Catawba only
  - NRC approval requested by August 2004
  - Load lead assemblies in Catawba Unit 1 spring 2005
- Batch use of MOX fuel
  - Submit license amendment request for McGuire and Catawba in 2005
  - Begin batch use of MOX fuel around 2009
  - Dispose of 34,000 kg of surplus plutonium through use as MOX fuel

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Lead Assembly Program – Activities and Schedule

- Spring 2004 – Complete polishing plutonium oxide powder at Los Alamos National Laboratory
- Summer-fall 2004 – Transport plutonium oxide powder to Europe
- Winter 2004-2005 – Fabricate MOX fuel pellets and rods at Cadarache and bundle assemblies at Melox
- Spring 2005 – Transport lead assemblies to Catawba

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MOX Fuel Lead Assembly Irradiation Plan

- Spring 2005 - spring 2008
  - Two eighteen month cycles
  - Irradiate all four MOX fuel assemblies in relatively high power locations
  - Certify MOX fuel for batch use following 2nd cycle, based on poolside post-irradiation examination (PIE) results
- Spring 2008 – fall 2009
  - Conduct hot cell (PIE) of MOX fuel rods removed after two cycles of operation
  - Irradiate one or more MOX fuel assemblies for a third cycle in relatively low power locations

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Required Regulatory Approvals

- Duke topical reports (thermal-hydraulic, nuclear analysis)
- Framatome topical reports (fuel performance, fuel assembly design, MOX fuel design)
- Duke license amendment request and exemption requests
- Duke security plan changes and exemption requests
- DOE export license application
- Packaging Technology transportation package certifications (powder and fuel assemblies)

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Lead Assembly License Amendment Request RAIs

- NRC Request for Additional Information (RAI) - Boraflex
  - Issued July 14, 2003
  - Response October 1, 2003
- NRC RAI – Reactor Systems, Radiological, Env.
  - Issued July 25, 2003
  - Partial response October 3, 2003
  - Complete response November 3, 2003
- NRC RAI - Quality Assurance
  - Issued August 13, 2003
  - Response October 1, 2003

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Lead Assembly LAR RAIs (cont.)

- NRC RAI – Environmental, Radiological
  - Issued November 21, 2003
  - Partial response (radiological) December 10, 2003
  - Environmental response scheduled for end of January 2004
- NRC RAI – Materials, Radiological
  - Issued December 16, 2003
  - Response scheduled for end of January 2004
- NRC RAI – QA
  - Issued December 24, 2003
  - Response scheduled for end of January 2004

Summary

- The United States MOX fuel lead assembly program is a key element of the international initiative to reduce the stockpiles of weapons grade plutonium in the United States and Russia
- NRC review and approval schedule is important
- Duke and Framatome ANP are committed to working with NRC to facilitate regulatory approvals