

U.S. Weapons Plutonium Disposition

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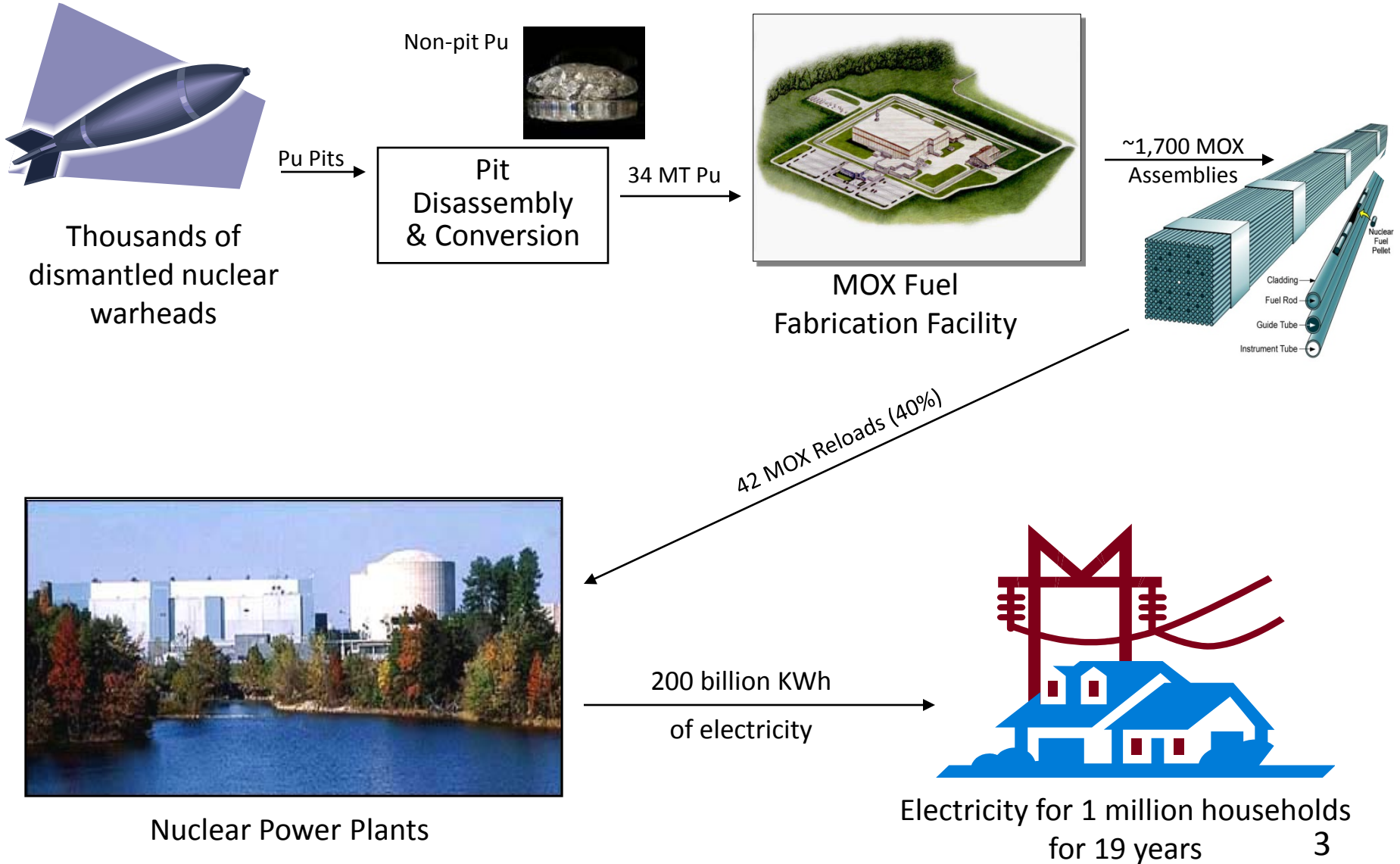
International Program Drivers

- **Amended U.S.-Russia Plutonium Management & Disposition Agreement** — Signed at the 2010 Nuclear Security Summit, commits each side to dispose of at least 34 MT of weapon-grade plutonium by irradiating it in reactors
- **U.S. Nonproliferation Treaty (NPT) Commitments:** Article VI states that “each of the Parties undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a Treaty on general and complete disarmament under strict and effective international control”
 - Disposing of surplus U.S. weapon-grade plutonium and HEU demonstrates that the U.S. is living up to its nonproliferation commitments under the NPT by drawing down its nuclear arsenal in a transparent, irreversible manner
- **IAEA Participation:** Verification Regime is the first time the IAEA has been called upon to verify nonproliferation activities in weapons states, strengthening the IAEA’s efforts to enforce NPT commitments

Selecting a Disposition Pathway

- After the Cold War, the U.S. committed to eliminate surplus fissile materials by declaring nearly 300 metric tons of fissile materials excess to defense needs
- U.S. Department of Energy charged the National Academy of Sciences (NAS) to evaluate the management and disposition options for excess plutonium.
- Alternatives considered included (but not limited to): fabrication into fuel, vitrification and deep bore holes
- NAS recommended fabrication into fuel for irradiation in reactors or vitrification with high level waste.
- Goal is to achieve the spent fuel standard as described by NAS.

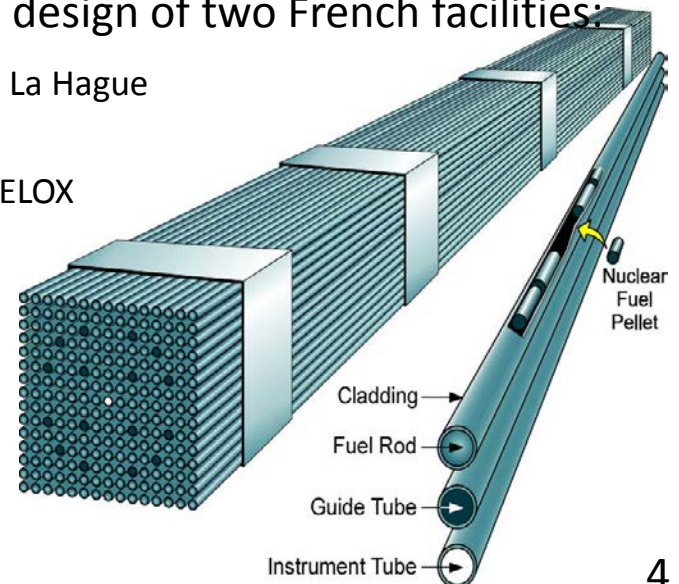
U.S. Plutonium Disposition Process



MOX Fuel Experience



- MOX fuel is currently being used in 31 reactors world wide, and has been used for decades.
- MOX fuel assemblies look identical to uranium fuel assemblies used in commercial nuclear power reactors.
- Once irradiated, spent MOX fuel will be treated the same as conventional spent LEU fuel.
- U.S. MOX facility is based on the design of two French facilities:
 - Aqueous polishing process from the La Hague reprocessing plant and
 - Fuel fabrication process from the MELOX facility



MOX Fuel Fabrication Facility



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MOX Fuel & U.S. Nuclear Industry

- NNSA modified the MFFF last year to manufacture fuel for both Pressurized Water Reactors and Boiling Water Reactors, which will allow the facility to make fuel for the entire U.S. light water reactor fleet.
- NNSA is consulting with various fuel fabricators regarding the option of having them market MOX fuel to their utility customers.
 - Working on a Blanket Commercial Agreement with Areva
 - Global Nuclear Fuels developed a proactive licensing strategy
- NNSA also continues to develop strategies to attract other utility customers
 - MOX Backup LEU Inventory to address supply concerns from utilities

Sharing Best Practices

- Leverage U.S. experience in disposing of weapons plutonium
- Promote technical cooperation on disposition
- Achieve nuclear security and nonproliferation goals