Conversion of at least 34 metric tons of weapons grade plutonium into mixed oxide fuel for use in commercial nuclear power plants

- **Mixed Oxide Fuel Fabrication Facility (MFFF)**
  - Produce mixed oxide fuel elements for irradiation in commercial nuclear power plants
- **Pit Disassembly and Conversion (PDC)**
  - Disassemble nuclear weapon pits, remove impurities, and convert the metal into oxide for MFFF
- **Waste Solidification Building (WSB)**
  - Receive high activity and low activity liquid waste streams from MFFF and PDC
Plutonium Disposition Path

- Weapons Disarmament
- Surplus Plutonium
- Interim Storage at Pantex
- Metal
- Pu Oxide Feed
- Pu Oxide Purification Capability
- MOX Fuel Fabrication at SRS
- Commercial Nuclear Reactors
- Spent fuel is unsuitable and unattractive for use in nuclear weapons

Mixed Oxide Fuel Fabrication Facility

- Began Construction: August 2007
- Total project complete: 49%
- Construction Complete: 32%
- Current employment: 2000
- Start Operations: October 2016
MFFF Process Building is a 500,000 ft highly secure, seismically-resistant steel reinforced concrete structure
- Aqueous Polishing Area will convert surplus plutonium to purified plutonium oxide powder
- Fuel Manufacturing Area will blend the plutonium oxide with depleted uranium oxide powder and produce mixed oxide fuel assemblies
- Shipping and Receiving Area is where plutonium shipments will be received and MOX fuel assemblies will be shipped to commercial nuclear reactors

16 Support Facilities complete the MFFF scope

MFFF Accomplishments
- Process Building concrete structure is 62% complete
- Installation of process gloveboxes/equipment, nuclear tanks, piping, HVAC and coatings ongoing in the Process Building
- 225 out of 274 glovebox mechanical process systems/shells have been purchased and are in various stages of fabrication and delivery
- 11 out of 16 support facilities constructed and in service
- Administration Building awarded LEED Gold Certification for energy/environmental friendly design
- Annual NRC review of MFFF construction did not identify any areas requiring improvement
Mixed Oxide Fuel Fabrication Facility

- MFFF Accomplishments
  - Construction achieved 4.7 million safe man-hours in 2010
  - Significant awards made to small businesses
    - Over 4,600 small business subcontracts awarded to date
    - Over $500M of subcontracts to small businesses
  - Two utilities are formally evaluating the potential use of MOX fuel in their reactors
    - Tennessee Valley Authority (3 BWRs, 2 PWRs)
    - Energy Northwest (1 BWR)
  - In December 2010, NRC approved the Safety Evaluation Report of the MFFF License Application
The WSB will receive liquid waste streams from MFFF and PDC
- Separate waste via evaporation
- Low level liquid waste is transferred to the Effluent Treatment Facility (ETF) at SRS
  - ETF conducts a final treatment process and clean water is then released to streams on site
- Higher activity waste is stabilized
  - Waste is combined with a cementitious mixture and put into 55 gallon drums
  - Stabilized waste will be disposed at an approved onsite or offsite location
• The PDC facility will convert surplus weapons grade plutonium into plutonium oxide suitable for use in the fabrication of mixed oxide fuel
  - Plutonium is converted to plutonium oxide
    • Residual classified attributes are removed
    • Then plutonium oxide is made available for conversion to MOX fuel
  - The facility will also process non-plutonium components
    • Decontaminate, convert and package uranium materials
    • Use declassification processes to disposition certain other materials as waste

• In 2009, DOE initiated an evaluation of locating PDC into the existing SRS K-Area facility in lieu of a stand-alone facility

• DOE is expected to make project management decisions and a NEPA determination regarding PDC in 2011