



# Nuclear Nonproliferation Programs

William D. Clark, Director

Fissile Materials Disposition Office, NA-266



# Fissile Materials Disposition

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## Background

- End of cold war brings arms reduction
  - Excess fissile materials accumulate in U.S. and Russia
  - Potential for theft by terrorists and rogue nations declared to be a “clear and present danger” by the National Science Foundation
- U.S. commits to eliminate surplus fissile materials
  - Approximately 200 metric tons of fissile materials declared excess to defense needs
  - Material will never again be used to build a nuclear weapon



*Berlin Wall comes down --  
1989  
End of Cold War*



# Nuclear Nonproliferation Program Goals

Objectives are national security and nonproliferation

- Dispose of surplus U.S. highly enriched uranium
- Dispose of 34 MT of surplus weapon-grade U.S. plutonium
- Work with Russia to dispose of 34 MT of surplus weapon-grade Russian plutonium
- Detect, prevent and reverse the proliferation of weapons of mass destruction, worldwide



Surplus U.S. HEU and plutonium will be converted to reactor fuel & irradiated in commercial nuclear power reactors.



Surplus Russian plutonium will be converted to MOX fuel and irradiated in Russian reactors.



# NNSA-NN Programs at SRS

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- Plutonium Disposition Program
  - MOX Fuel Fabrication Facility
  - Pit Disassembly and Conversion Facility
  - Waste Solidification Building
  - Common Technologies
- International Programs
- Foreign Research Reactor Spent Fuel Acceptance Program



# Mixed Oxide Fuel Fabrication Facility (MOX FFF)



Preliminary\* Total Project Cost:  
\$4.7 billion

Preliminary\* Schedule

Design complete	77%
Start of Construction	TBD
Finish Construction	Sept. 2013
Hot Start-up	Jan. 2015

\* - Assumes Congress approves President's full FY 2007 and out year budget requests.

## Project Functions

- Blend weapons grade plutonium with uranium to make mixed oxide (MOX) fuel assemblies
- MOX fuel assemblies will be irradiated in Duke Power commercial reactors
- The plutonium will no longer be useable in nuclear weapons



# Contractor Work Scope - MOX FFF

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Note: The MOX FFF is being designed and constructed by Shaw AREVA MOX Services.

## Contractor Support Activities

Engineering and Technical Support to NNSA

- Technical review of documents and designs
- Technical studies and evaluation of design alternatives
- Environmental and regulatory review

Engineering and Technical Support to MOX contractor

- Technical and regulatory assistance, including SRS site operations interface
- Interpretation and guidance on requirements, Safeguards and Security, Material Control and Accountability, and cyber security

Term – Through end of contract

Value of Work Effort – \$12 to \$22 million per year



# Pit Disassembly and Conversion Facility (PDCF)



## Project Functions

- Disassemble pits and separate components
- Oxidize and package plutonium for MOX FFF
- Declassify and dispose of all other materials

Preliminary\* Total Project Cost:  
\$1.5 billion

### Preliminary\* Schedule

Design	65% complete
Construction Start	October 2010
Finish Construction	Sept. 2015
Hot Start-up	Sept. 2017

\* - Assumes Congress approves President's full FY 2007 and out year budget requests.



# Contractor Work Scope - PDCF

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Note: The PDCF is being designed by WGI.

## Contractor Support Activities

- Program Management Support
  - Studies on value engineering, design alternatives, reviews
  - Cost estimating or review, change control, configuration management, project oversight, operating procedures development
  - Operations oversight
- Engineering Support
  - Safety analyses, authorization basis documents
- Serve as Design Authority
- Construction Management
  - Assist NNSA in or procure, direct, and oversee a construction management firm
- Startup and Testing (outside contract window)
- Operations (outside contract window)

Term – Through end of contract

Value of Work Effort - \$8 to \$10 million per year



# Waste Solidification Building (WSB)



Preliminary\* Total Project Cost:

\$226 million

Preliminary\* Schedule

Design 20% complete

Construction Start April 2008

Finish Construction June 2011

Hot Start-up June 2012

\* - Assumes Congress approves President's full FY 2007 and out year budget requests.

## Project Functions

- Solidify high activity and low activity liquid waste streams from MFFF and PDCF for disposal:
  - Evaporate
  - Neutralize
  - Cement
  - Package for shipment



# Contractor Work Scope - WSB

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## Contractor Support Activities

- Design Engineering
- Design Authority
- Procurement
- Documented Safety Analysis
- Construction Oversight
- Startup and Testing
- Operations

Term – Through end of contract

Value of Work Effort - ~\$225 million



# Common Technologies

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## Program Functions

Nuclear non-proliferation related programmatic activities that support or benefit more than one NN project.

## Contractor Support Activities

- Feed Materials Characterization
- Transportation and Shipping Analyses
- Program Integration Management and Planning
- Interface Management
- Safeguards and Security
- Quality Assurance and Integrated Safety Management
- Environmental and Waste Management Support
- Administrative Support
- Risk Management

Term – Through end of contract

Value of Work Effort ~ \$1million per year



# International Programs

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## Program Functions

Limit or prevent the spread of materials, technology, and expertise related to proliferation of WMD worldwide and eliminate or secure inventories of surplus nuclear materials usable for weapons.

## Contractor Support Activities

- Provide studies, seminars, training
- Develop technologies to detect and monitor nuclear weapons production and proliferation
- Support hosting of international Material Protection, Control, and Accountability Teams
- Provide nuclear monitoring and inspection services
- Evaluate safeguards at overseas nuclear plants
- Support Nuclear Cities Initiatives in Russia

Term – Through end of contract

Value of Work Effort - \$10 to \$17 million per year



# Foreign Research Reactor Spent Fuel Acceptance Program

## Program Functions

Spent nuclear fuel is shipped from foreign reactors to Charleston, inspected, and shipped by land to SRS and Idaho for storage.



## Contractor Support Activities

Support activities for up to four shipments per year from Charleston to SRS and from SRS to Idaho National Lab:

- Receipt and unloading preparations
- Onsite overseas fuel inspection
- Radioactive screening of shipments
- Operations support



Term – Through end of contract

Note: Most of this work is performed under EM funding.  
Some exceptions exceeding the baseline may be funded by the OFMD program, up to \$1 M per year.