

Status of the U.S. Plutonium Disposition Program

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Concerns of the Bush Administration about the Plutonium Disposition Program in Early 2001

- **Cost of the entire program (both the U.S. and Russian activities)**
- **Prospects for international funding of the Russian program**
- **Sustainability of the programs**
- **Potential to advance commercial U.S. nuclear technology**

Review and Development of Plan for Disposal of Surplus Defense Plutonium

- U.S. DOE directed by Congress in National Defense Authorization Act of FY2002
- Congress directives
 - Review each option considered for such disposal
 - Identify the preferred option
 - State the cost of construction and operation of the facilities required
 - Specify a schedule for construction of such facilities
 - Specify a schedule for funding the cost of such facilities
 - Specify the means by which all such plutonium would be removed from the SRS for storage or disposal elsewhere
 - Such report to be completed by February 2002
- The National Nuclear Security Administration (NNSA, within the U.S. DOE) submitted to Congress on 15 February 2002 the “Report to Congress: Disposition of the Surplus Plutonium at Savannah River”

NNSA Review Purpose

- **Identify and recommend a more cost effective approach to disposition of excess plutonium in U.S. and R.F.**
 - **Engages Russian interest and commitment**
 - **For this reason, advanced reactor concepts (i.e., fast and gas-cooled) were considered**
 - **Avoids undercutting existing commitment (for example, START or the September 2000 U.S.-Russia Plutonium Management and Disposition Agreement)**
 - **Supports broader U.S. nonproliferation and security objectives**

12 Distinct Domestic Options Selected for Detailed Analyses by NNSA

- **6 MOX-based reactor disposition options**
- **2 advanced reactor disposition options**
- **4 non-reactor options**
 - **Immobilization and long-term storage**
- ◆ **Each option judged for consistency with September 2002 agreement and whether Russia agreed the option was reasonable**

Preferred Domestic U.S. Option

- **MOX-based reactor disposition with high quality Pu (some material, formerly slated for immobilization, purified in enhanced MOX Fuel Fabrication Facility)**
 - All 34 MT of U.S. plutonium to be converted to MOX and irradiated
 - **No** immobilization [Plutonium Immobilization Plant (PIP) canceled]
 - Total life cycle cost implemented over 20 years: ~\$3.84 billion
 - Pit Disassembly and conversion Facility (PDCF): ~1.69 billion
 - MOX FFF: ~\$2.15 billion
 - Savings of ~\$2-3 billion from March 2001 cost report
 - Elimination of PIP
 - Optimized PDCF
 - Shortened operating lifetimes
 - Peak yearly funding reduced by sequential construction of MFFF and PDCF
 - Results in removal from SRS of **all** surplus defense plutonium
 - Facilitates closure of Rocky Flats Plant by 2006 and removal of Pu from other DOE sites

Preferred Option: Key Milestones as of February 2002

Milestone	Facilities	
	PDCF	MOX FFF
Conceptual design/NEPA	n/a	n/a
Design	FY 1999-2004	FY 1999-2003
NRC licensing	n/a	FY2002-2005
Long-lead equipment procurement & site preparation	FY 2005-2006	FY 2003-2004
Construction	FY 2006-2009	FY 2004-2007
Startup	FY 2009	FY 2007
First MOX fuel fabricated	n/a	FY 2008
Full-scale operations	FY 2010-2017	FY 2007-2019
Deactivation	FY 2018	FY2020

U.S. Pu Disposition Program

- **Pit Disassembly and Conversion Facility**
 - To be built at the SRS
 - Completion of design: 2004
 - Equipment procurement and site preparation: 2005-2006
 - Start of construction: 2006
 - Startup: 2009
 - Industrial-scale operation: 2010-2017
- **MOX Fuel Fabrication Facility**
 - To be built at the SRS (DOE's January 2000 ROD)
 - A consortium of Duke, COGEMA, Stone & Webster (DCS) will design, construct, and operate the facility
 - Completion of design – 2003
 - Start of construction – 2004
 - Start-up – 2007
 - Industrial-scale operation – 2008
- **MOX fuel qualification**
- **MOX FFF licensing**

U.S. Pu Disposition Program (continued)

- **MOX Fuel Fabrication Facility (MFFF)**
 - **Quality Assurance (QA) plan**
 - Submitted by DCS – June 2000
 - Approved by NRC – October 2001
 - **Environmental Report (ER)**
 - Submitted by DCS – December 2000
 - NRC public scoping meetings – April 2001
(North Augusta, SC; Savannah, GA; Charlotte, NC)
 - NRC EIS scoping document issued – August 2001
 - Updated ER – July 2002
 - Target date for draft EIS for public comment – **February 2003^a**
 - Target date for final EIS – **August 2003**
 - **Construction Authorization Request (CAR)**
 - Application submitted by DCS – February 2001
 - Round 1 RAI issued by NRC – June 2001
 - DCS response – August 2001
 - Draft SER issued – April 2002
 - Updated CAR – October 2002
 - Target date for final SER – **September 2003^a**
 - Target date for licensing decision – **September 2003**

U.S. Pu Disposition Program (continued)

- **MOX fuel qualification**
 - **FANP as subcontractor to DCS**
 - **July 2000, MOX fuel qualification plan (FQP) submitted to NRC**
 - **July 2000, MOX LA project at LANL canceled**
 - **April 2001, revised FQP submitted to NRC**
 - **Lead Assemblies (LA)**
 - **“Eurofab,” fabricate LAs in Europe with U.S. PuO₂**
 - **Wait for MFFF**

NRC Has Established a Website Containing Current Information on Licensing Activities for the MFFF

- August 2000, NUREG-1718 (Standard Review Plan for MFFF) issued by NRC
- November 2000, NRC established web site for MOX licensing activities
<http://www.nrc.gov/NRC/NMSS/MOX/index.html> (site removed after Sept. 11)
- March 2002, NRC MOX website revised
<http://www.nrc.gov/materials/fuel-cycle-fac/mox/licensing.html>
- Links for
 - License applications
 - NRC staff guidance documents
 - MOX fuel newsletter
 - Frequently asked questions
 - Upcoming meetings
 - Mechanism for providing public comment
 - Additional information

U.S. Pu Disposition Program (continued)

- **Estimated life cycle costs for PDCF and MFFF are ~\$3.8 billion (including credits for LEU fuel displaced by MOX fuel)**
- **Revised approach**
 - **Focus on MOX/irradiation – key to bilateral agreement with R.F.**
 - **Sequential design and construction of major U.S. facilities**
 - **Proceed with MFFF design**
 - **Followed by PDCF design**
 - **Completes disposition mission within original timeframe and supports U.S./R.F. agreement**

New Developments

- **“Strategic Offensive Reductions Treaty” signed by Bush and Putin on 24 May 2002**
 - Reduces number of active warheads to 1700-2000 for each country by end of 2012
 - Text at <http://www.whitehouse.gov/news/releases/2002/05/print/20020524-3.html>
- **G8 commitment (June 2002)**
 - \$10B (U.S.) + \$10B (G8) initiative over 10 years to stop the spread of weapons and materials of mass destruction
 - See http://www.g8.gc.ca/kan_docs/globpart-e.asp
- **Impact on plutonium disposition programs in U.S. and Russia are positive**
 - Next step: bilateral meeting in mid-July (Moscow)