



The Secretary of Energy
Washington, DC 20585

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February 3, 2003

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The Honorable J. Dennis Hastert
Speaker of the House of Representatives
Washington, DC 20515

Dear Mr. Speaker:

Section 3182 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003 requires that the Department of Energy submit to Congress a plan for the construction and operation of the mixed oxide (MOX) facility at the Savannah River Site in Aiken, South Carolina.

Enclosed you will find the Department's response to this request. We appreciate your continuing interest in this important nonproliferation program. If you have any questions, please feel free to contact me.

Sincerely,

Spencer Abraham

Enclosure



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A handwritten signature in black ink that reads "Spencer Abraham".

Spencer Abraham

Enclosure



**REPORT TO CONGRESS:
IMPLEMENTING U.S. PLUTONIUM DISPOSITION
AT THE SAVANNAH RIVER SITE**

Introduction:

In the Bob Stump National Defense Authorization Act of FY 2003, Congress directed the U.S. Department of Energy (DOE) to provide, not later than February 1, 2003, a plan for the construction and operation of the mixed oxide (MOX) facility at the Savannah River Site (SRS) in Aiken, South Carolina. Congress directed that the plan include:

- 1) A schedule for construction and operations so as to achieve, as of January 1, 2009, and thereafter, the MOX production objective¹, and to produce one metric ton of mixed oxide fuel by December 31, 2009; and
- 2) A schedule of operations of the MOX facility designed so that 34 metric tons of defense plutonium and defense plutonium materials will be processed into MOX fuel at SRS by January 1, 2019.

This report is the Department of Energy's response to the Congressional requirement.

Background:

Following a detailed review of nonproliferation programs with Russia, the Administration revised the U.S. strategy for disposing of surplus plutonium in January 2002. The new strategy eliminated immobilization as a disposition technology and focused exclusively on the irradiation of MOX fuel in domestic commercial reactors. As part of the revised strategy, impure non-pit plutonium that was originally intended for immobilization will now be purified in a new enhanced aqueous polishing capability designed into the front-end of the MOX Fuel Fabrication Facility.

Under the revised strategy, the Department will construct and operate two facilities at the SRS in South Carolina:

- Pit Disassembly and Conversion Facility: 1) disassemble plutonium weapons components; 2) separate the plutonium metal from other weapon parts; 3) convert the plutonium metal to an unclassified plutonium oxide form, suitable for

¹ The National Defense Authorization Act for FY 2003 defines the MOX production objective as production at the MOX facility of mixed-oxide fuel from defense plutonium and defense plutonium materials at an average rate equivalent to not less than one metric ton of mixed-oxide fuel per year. The average rate shall be determined by measuring production at the MOX facility from the date the facility is declared operational to the Nuclear Regulatory Commission through the date of assessment.

disposition; and, 4) package the resulting plutonium oxide for temporary storage, pending disposition in a MOX Fuel Fabrication Facility; and

- Mixed Oxide Fuel Fabrication Facility: 1) mix plutonium oxide from the pit disassembly and conversion process with uranium oxide; 2) form mixed oxide fuel pellets; 3) fabricate the pellets into mixed oxide fuel assemblies; and, 4) ship the completed fuel assemblies to domestic commercial reactors for irradiation.

Construction and operation of the MOX Fuel Fabrication Facility will be licensed by the U.S. Nuclear Regulatory Commission. Duke Power Company, under contract to the Department of Energy, will irradiate the MOX fuel in commercial reactor facilities in North Carolina and South Carolina. Duke Power Company is in the process of applying for revised operating licenses from the Nuclear Regulatory Commission, which will allow the reactors to irradiate mixed oxide fuel.

Schedule:

Initial fabrication of plutonium into MOX fuel and shipment to Duke Power reactors is scheduled to begin in FY 2008 and be completed in FY 2019. These and other key steps for implementing the U.S. plutonium disposition strategy are listed in Table 1.

Table 1. Schedule for Construction and Operations

	<u>Mixed Oxide Fuel Fabrication Facility</u>	<u>Pit Disassembly and Conversion Facility</u>
Conceptual Design/NEPA	n/a	n/a
Design	FY 1999 – 2003	FY1999 – 2004
NRC Licensing	FY 2000 – 2005	n/a
Long-lead equipment procurement & site preparation	FY 2000 – 2004	FY 2003 – 2004
Construction	FY 2004 – 2007	FY 2006 – 2009
Start-up	FY 2007	FY 2009
First MOX fuel fabricated and delivered to reactors	FY 2008	n/a
Full-scale operations	FY 2007 – 2019	FY 2010 – 2017
Facility deactivation	FY 2020	FY 2018

The MOX facility will come on-line before the Pit Disassembly and Conversion Facility in order to reduce the annual funding requirements associated with construction of both facilities simultaneously and because sufficient quantities of plutonium oxide will be available in the early years of the effort for the facility to begin operations. The Pit

Disassembly and Conversion Facility will commence start-up operations in 2009 and will be used for the bulk of the 34 MT of surplus plutonium remains in nuclear weapons component (pit) form.

Mixed oxide fuel will be fabricated at a rate of approximately 2 metric tons per year for the first three years, beginning in 2008, and 3.5 metric tons per year thereafter. See Table 2.

Table 2. Production Schedule for MOX

<u>Year</u>	<u>MOX Production (MT/year)</u>
2008	2
2009	2
2010	2
2011	3.5
2012	3.5
2013	3.5
2014	3.5
2015	3.5
2016	3.5
2017	3.5
2018	<u>3.5</u>

34 metric tons

Under the September 2000 U.S.-Russia Plutonium Management and Disposition Agreement, the two sides have committed to dispose of their surplus plutonium in parallel. While the U.S. program has progressed according to schedule, the Russian program has slipped.

To accelerate the Russian program and bring the two programs back on a parallel track, the Russian Federation has accepted the U.S. offer to use the U.S. design for the aqueous polishing capability and MOX Fuel Fabrication Facility being developed by Duke, Cogema, Stone & Webster. This will greatly accelerate the Russian disposition effort, help to ensure parallelism between the two programs, save money and time by avoiding the need to design Russian facilities for conversion and MOX fuel fabrication, and provide for greater material security.

Concerted efforts are presently underway to "Russianize" the detailed design of the U.S. facility, reach agreement on licensing arrangements to permit Russia to use Cogema MOX technology for plutonium disposition, and establish a viable management structure

to implement plutonium disposition in Russia. Due to the mandate that the U.S. and Russian programs must proceed in parallel, the U.S. program may have to be delayed slightly in order to allow the Russian program to catch up to the U.S. program schedule. The exact timing cannot be determined until detailed technical discussions take place with the Russians. As soon as changes to the U.S. schedule for plutonium disposition are identified, the Department will notify Congress, as appropriate.