



September 2, 2005  
AET 05-0069

Mr. Jack R. Strosnider  
Director, Office of Nuclear Material Safety and Safeguards  
Attention: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

**American Centrifuge Plant  
Docket Number 70-7004  
Submittal of Additional Information Related to Request for Additional Information**

Dear Mr. Strosnider:

USEC Inc. (USEC) hereby submits to the U.S. Nuclear Regulatory Commission (NRC) additional information related to the Request for Additional Information regarding tails disposal costs for the American Centrifuge Plant. The additional information is provided in Enclosure 1. Changed pages of the Decommissioning Funding Plan and Chapter 10.0 of the License Application are provided in Enclosure 2.

If you have any questions regarding this matter, please contact Peter J. Miner at (301) 564-3470.

Sincerely,

Steven A. Toelle  
Director, Nuclear Regulatory Affairs

cc: Y. Faraz, NRC HQ  
B. Smith, NRC HQ

Enclosures: As Stated

*NMSS01*

**Enclosure 1 to AET 05-0069**

**Submittal of Additional Information Related to Request for Additional Information**

## Enclosure 1 to AET 05-0069

In a letter dated May 23, 2005, in response to the U.S. Nuclear Regulatory Commission's (NRC) Request for Additional Information, we stated that USEC had received a copy of a letter from the U.S. Department of Energy (DOE) to Louisiana Energy Services (LES) containing an estimate of costs to dispose of LES's tails and that USEC had contacted DOE concerning the LES estimate. Based upon the very limited information received, USEC continued examination of this estimate and its underlying assumptions to determine if any adjustment to USEC's unit cost for tails disposal was necessary.

Accordingly, since that time several subsequent discussions with DOE and their consultant have taken place. Unfortunately, we have gained only minor insights into the details of the cost estimate. We had requested and were denied access to a copy of the consultant's detailed cost estimate report for tails disposal from both DOE and the NRC. Therefore, we were unable to confirm whether the assumptions and the related costs utilized by DOE's consultant are appropriate for the American Centrifuge Plant tails disposal cost estimate.

Our examination of the available information has identified that the unit cost to dispose of tails for the American Centrifuge Plant could range between \$3.00/kilogram (kg) uranium (U) to \$4.83/kg U, depending on a number of factors and assumptions. The unknown factors include: location(s) for processing USEC depleted uranium, transportation costs, escalation rate(s) of various construction cost components; de-escalation rate(s) of future operating costs (to present day dollars); volume of tails disposed; revenue/avoided disposal cost from sale of conversion products (e.g., hydrogen fluoride) or higher assay tails (tail stripping); construction and operations budget contingencies; allocation of decontamination and decommissioning costs (between USEC and DOE); and DOE oversight costs.

In order to ensure the American Centrifuge Plant licensing schedule is not impacted by this issue, USEC has determined that the most expedient resolution of the NRC's Request for Additional Information is to develop the tails disposal cost estimate for the American Centrifuge Plant based on the estimated cost of disposal provided in the DOE's March 1, 2005 letter to LES. Based on this letter, we have calculated the estimated tails disposal cost for the American Centrifuge Plant to be \$4.83/kg U subject to the review requirements specified in the license application. We believe that the \$4.83/kg U should be viewed as the conservative upper bound of the range mentioned above and is based on the DOE estimate of \$3.34/kg depleted UF<sub>6</sub> (\$4.91/kg U) less \$0.08 (the estimated cost avoidance of transportation of USEC tails to the DOE conversion facility). We have revised the Decommissioning Funding Plan and Chapter 10 of the License Application to reflect tails disposal liability at \$4.83/kg U. We will update this cost estimate as additional information becomes available.

**Enclosure 2 to AET 05-0069**

**Submittal of Changed Pages Related to Request for Additional Information**

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# License Application

## for the American Centrifuge Plant

in Piketon, Ohio



Revision 7

Docket No. 70-7004

September 2005

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Reviewer: R. Coriell  
Date: 09/02/05

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LA-3605-0001

**LICENSE APPLICATION**  
**for the American Centrifuge Plant**  
**in Piketon, Ohio**

**Docket No. 70-7004**

**Revision 7**

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Revision 0 – 10 CFR 1045 review completed by L. Sparks on 07/29/04 and the Export Controlled Information review completed by R. Coriell on 07/30/04.

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Revision 4 – 10 CFR 1045 review completed by R. Coriell on 06/16/05 and the Export Controlled Information review completed by D. Hupp on 06/16/05.

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- Dismantling area
- Cutting machines
- Dismantling boxes and tanks (e.g., B-25 boxes)
- Degreasers
- Citric acid and demineralized water baths
- Contamination monitors
- Wet blast cabinets
- Crushers or size reduction equipment
- Shredding equipment
- Scrubbing facility

There is no normal operational need for the ACP to have a decontamination facility readily available.

### 10.8.2 Procedures

Procedures for decontamination will be developed and approved by plant management to minimize worker exposure and waste volumes, and to assure work is carried out in a safe manner. At the end of useful plant life, some of the equipment, most of the buildings, and the outdoor areas should already be acceptable for release for unrestricted use in accordance with 10 CFR 20.1402. If these areas were inadvertently contaminated during ACP operation, they would likely be cleaned up when the contamination is discovered. This limits the scope of necessary decontamination at the time of decommissioning.

The centrifuges will be processed and the following operations will be performed:

- Removal of external fittings;
- Removal of bottom flange, motor and bearings, and collection of contaminated oil;
- Removal of top flange, and withdrawal and disassembly of internals;
- Degreasing of items, as required; and

- Destruction of classified parts by shredding, crushing, burial, etc.

### 10.8.3 Results

Recoverable items will be externally decontaminated and suitable for reuse except for a very small amount of internally contaminated items where recovery and reuse is not feasible. There is potentially a small amount of salvageable scrap material. Material requiring disposal will be process piping, trash, and residue from the effluent treatment systems. No problems are anticipated which will prevent the facilities from being released for unrestricted use.

### 10.9 Agreements with Outside Organizations

The decommissioning activities described herein and in the DFP provide for decontamination of the ACP for unrestricted use. As such, no agreements with outside organizations are required for control of access to the plant following shutdown and decommissioning.

### 10.10 Arrangements for Funding

This section provides a general estimate of plant decommissioning costs and UF<sub>6</sub> tails disposition costs, as well as explains the arrangements made to assure funding is available to cover these costs. A more detailed description of these costs and the financial assurance mechanism is provided in the DFP.

#### 10.10.1 Plant Decommissioning Costs

Table 10.10-1, provides a summary of the cost estimates of the major decommissioning activities described in Section 10.2. Costs are provided in 2004 dollars with a 25 percent contingency factor added based on the NRC guidance (Reference 4). As noted below, the total estimated cost to decommission the 3.5 million SWU ACP, excluding UF<sub>6</sub> tails disposition, is \$261.3 million. Since costs will likely change between the time of license issuance and actual decommissioning, USEC will adjust the cost estimate prior to operation of each additional increment of capacity on process gas, and after full capacity is reached, no less frequently than every three years consistent with the requirements of 10 CFR 70.25(e) and recent NRC changes to financial assurance requirements for materials licensees (Reference 8). The method for adjusting the cost estimate will consider the following:

- Changes in general inflation (e.g., labor rates, consumer price index);
- Changes in price of goods (e.g., packing materials);
- Changes in price of services (e.g., shipping and disposal costs);

liquid waste from the centrifuge internals and 1,730,000 cubic feet of classified waste in non-reusable packaging.

**Equipment and Supply: \$15 million**

This includes the purchase or lease of dismantling, cutting, degreasing, and crushing equipment; decontamination tanks, wet blast cabinets, and over 20,000 containers (B-25 boxes and 55 gallon drums).

**Laboratory: \$1.3 million**

This includes labor costs for sampling, transport, testing, and analysis of samples.

**Indirect Services: \$33.6 million**

This includes support services (such as laundry, janitorial, etc) and infrastructure costs (such as water, power, etc) not included in other tasks.

**Miscellaneous: \$27.6 million**

This includes direct costs of \$2.5 million for miscellaneous material for decommissioning and \$25.1 million for indirect costs, such as NRC review fees for the submitted DP, license fees, DOE lease fees, business insurance, and taxes.

<b>Subtotal</b>	<b>\$174.5 million</b>
<b>General and Administrative (6 percent)</b>	<b>\$10.4 million</b>
<b>Contractor Profit (15 percent)<sup>4</sup></b>	<b>\$24.0 million</b>
<b>Contingency (25 percent)</b>	<b>\$52.2 million</b>
<b>Total Plant Decommissioning Cost Estimate</b>	<b>\$261.3 million</b>

<sup>4</sup> Contractor Profit = 0.15[(Subtotal + General and Administrative) - (NRC Review Fees + License Fees + DOE Lease Fees)]

### 10.10.2 UF<sub>6</sub> Tails Disposition Costs

Cost estimates to dispose of UF<sub>6</sub> tails generated during ACP operation are separate from the cost estimates to decommission the plant. As noted previously, the ultimate disposal of UF<sub>6</sub> tails remains to be determined. USEC intends to evaluate possible commercial uses of UF<sub>6</sub> tails before having the tails processed by the DOE UF<sub>6</sub> conversion facility in Piketon, Ohio. UF<sub>6</sub> tails are stored in steel cylinders until they can be processed in accordance with the disposal strategy established by USEC. Depending on technological developments and the existence of facilities available prior to ACP shutdown, the tails may have commercial value and may be marketable for further enrichment or other processes. However, for the purposes of calculating the UF<sub>6</sub> tails disposition cost, USEC assumes that the total quantity of tails generated during ACP operation are processed by the DOE UF<sub>6</sub> conversion facility in Piketon, Ohio.

For conservatism, USEC provides financial assurance to fund the estimated cost of conversion and disposal of the depleted uranium inventory as it is generated during ACP operation. This funding is described in the DFP and is in addition to the funding requirements for decommissioning the ACP. As with plant decommissioning, the cost estimate will likely change between the time of license issuance and actual decommissioning. USEC commits to adjust the cost estimate for tails disposal prior to operation of each additional increment of capacity on process gas and no less frequent than annually, once full capacity is achieved. The method for adjusting the cost estimate will consider the same factors as previously described in Section 10.10.1 of this chapter.

At full capacity, the ACP will generate approximately 9,520 MT of UF<sub>6</sub> tails annually. As with other decommissioning costs, the disposal cost estimate for UF<sub>6</sub> tails disposal is provided in 2004 dollars. In view of the commitment to annually adjust tails disposal cost estimates, the ability to know with certainty the tails inventory from prior years of ACP operation, and USEC's demonstrated ability to accurately and conservatively predict anticipated tails generation one year ahead of time, a 10 percent contingency factor is applied to the tails disposal cost estimate. This contingency factor is consistent with that used for tails generated from the United States Enrichment Corporation's GDP operations. The total estimated cost to dispose of UF<sub>6</sub> tails over the 30-year license, including a four-year ramp up to full capacity and the 10 percent contingency factor, is \$953.0 million. The basis for this estimate is provided in the DFP.

### 10.10.3 Total Decommissioning Liability

USEC's total decommissioning liability is the sum of the total plant decommissioning costs and the tails disposition costs. USEC's total liability for decommissioning the ACP, including applicable contingencies, is:

Plant Decommissioning Cost	\$ 261.3 million
<u>UF<sub>6</sub> Tails Disposition Cost</u>	<u>\$ 953.0 million</u>
Total Decommissioning Liability	\$1,214.4 million

Table 10.10-1 Plant Decommissioning Cost Estimates and Expected Duration

<u>Task/Item</u>	<u>Cost Estimate</u> (Millions, 2004 dollars)	<u>Approx</u> <u>Percentage</u>
Planning and Preparation	\$2.6	2%
Decontamination and/or Dismantling of Radioactive Facilities	\$42.5	24%
Restoration of Contaminated Areas On Plant Grounds	\$0.8	1%
Final Status Survey	\$1.1	1%
Site Stabilization and Long-Term Surveillance	\$2.5	1%
Packing Materials, Shipping, and Waste Disposal	\$47.5	27%
Equipment and Supply	\$15.0	9%
Laboratory	\$1.3	1%
Indirect Services	\$33.6	19%
Miscellaneous	\$27.6	17%
Subtotal	\$174.5	100%
General and Administrative (6%)	10.5	
Contractor Profit (15%)	24.0	
Contingency (25%)	\$52.3	
<b>Total Plant Decommissioning Cost</b>	<b>\$261.3</b>	
UF <sub>6</sub> Tails Disposal Costs	\$866.4	
UF <sub>6</sub> Tails Contingency (10%)	86.4	
<b>Total UF<sub>6</sub> Tails Disposition Cost</b>	<b>\$953.0</b>	
<b>Total Decommissioning Liability</b>	<b>\$1,214.4</b>	

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# Decommissioning Funding Plan

## for the American Centrifuge Plant

in Piketon, Ohio



Revision 5

Docket No. 70-7004

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Reviewer: R. Coriell  
Date: 09/02/05

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NR-3605-0006

**DECOMMISSIONING FUNDING PLAN  
for the American Centrifuge Plant  
in Piketon, Ohio**

**Docket No. 70-7004**

**Revision 5**

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## 1.0 INTRODUCTION

USEC Inc. (USEC) hereby submits, pursuant to the provisions of the *Atomic Energy Act* of 1954, as amended, and the rules and regulations of the U.S. Nuclear Regulatory Commission (NRC), its Decommissioning Funding Plan (DFP) for the American Centrifuge Plant (ACP) in Piketon, Ohio. This DFP sets forth the information required by 10 *Code of Federal Regulations* (CFR) Part 70 regarding USEC's plans for funding the decommissioning of the ACP and disposal of depleted uranium generated as a result of ACP operations.

As indicated below, USEC presently intends to provide for decommissioning funding through a surety bond in accordance with applicable requirements of 10 CFR Part 70. However, USEC may choose to utilize alternate financial assurance funding methods. Alternate funding methods, if chosen, will be prepared using the guidance provided in NUREG 1757, Volume 3, Appendix A and will satisfy the requirements of 10 CFR Part 70. The actual funding method to be used will be executed prior to the commencement of enrichment operations. In the interim, appropriate model documentation for this funding method is provided in Appendix A and B of this plan. Upon execution of the funding instruments, USEC will supplement this portion of its application.

## 2.0 GENERAL INFORMATION

**Plant Description:** The ACP is located in the U.S. Department of Energy (DOE) reservation in Piketon, Ohio, in areas and facilities leased by USEC from the DOE.<sup>1</sup> The ACP encompasses the construction, start-up, operation, and maintenance of a uranium enrichment process using American Centrifuge technology that will produce 3.5 million separative work units (SWU) annually at full capacity. Chapter 1.0 of the License Application for the American Centrifuge Plant provides a description of the various facilities associated with the ACP.

**Licensed Material:** The License Application for the ACP seeks authorization to operate a uranium enrichment plant to enrich uranium hexafluoride (UF<sub>6</sub>) using centrifuge technology. Uranium enriched in the <sup>235</sup>U isotope up to the licensed limit of 10 weight percent <sup>235</sup>U will be withdrawn and shipped from the plant. Material depleted in the <sup>235</sup>U isotope (UF<sub>6</sub> tails) will also be withdrawn and stored on site. At full capacity, the ACP generates approximately 9,520 Metric Tons (MT) of UF<sub>6</sub> tails annually. Therefore, pursuant to 10 CFR 70.25(a), a DFP is required.

**Schedule:** Construction of the ACP will commence following issuance of a license by the NRC. Based on the unique modular aspects of the centrifuge technology, capacity is brought on line in phases.

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<sup>1</sup> Details regarding the planned operations of the ACP may be found in the License Application and the accompanying Environmental Report.

**Period of Operation:** The License Application seeks authorization to operate for a period of 30 years.

**Decommissioning Costs:** USEC has prepared a site-specific decommissioning cost estimate for the decommissioning of the ACP and disposal of the UF<sub>6</sub> tails. This cost estimate utilizes current information regarding the activities and associated costs of decommissioning the 3.5 million SWU plant.

The estimate and associated funding mechanisms will be adjusted over time, in accordance with the applicable provisions of 10 CFR Part 70 as described in Section 5.0 of this plan.

**Decommissioning Funding:** As set forth in this DFP, USEC presently intends to utilize a surety bond to provide reasonable assurance of the availability of decommissioning funds when needed. This funding mechanism is intended to satisfy the provisions of 10 CFR Part 70 with respect to decommissioning financial assurance for license applicants. However, as described in Section 1.0 of this plan, USEC may choose to utilize alternate financial assurance funding methods. As described in Section 10.10.4 of the License Application for the American Centrifuge Plant, the financial assurance for decommissioning the plant and disposal of UF<sub>6</sub> tails will be provided incrementally as centrifuges are installed, operated on process gas, and UF<sub>6</sub> tails generated. In this way, financial assurance will be made available as the decommissioning liability is incurred.

### 3.0 DECOMMISSIONING COST ESTIMATE

Pursuant to 10 CFR 70.25(e) and the guidance provided by the NRC in NUREG-1757, *Consolidated NMSS Decommissioning Guidance*, USEC has evaluated the estimated costs of decommissioning the ACP. These estimated costs involve plant decommissioning costs and tails disposal costs. The plant will be decommissioned such that the facilities may be released for unrestricted use. The estimated costs for decommissioning are patterned after NRC guidance in Appendix A of NUREG-1757 Volume 3, as set forth in the tables contained in Appendix C and D of this DFP and noted below (Note: To maintain consistent table sequence numbers with those presented in NUREG-1757, Appendix A, Tables 3.1 through 3.3 are not used):

- Facility Description Summary (Table C3.4 and Table C3.4A)
- Number and Dimensions of Facility Components (Table C3.5 and Table C3.5A)
- Planning and Preparation (Table C3.6)
- Decontamination or Dismantling of Radioactive Facility Components (Table C3.7)
- Restoration of Contaminated Areas on Facility Grounds (Table C3.8)
- Final Radiation Survey (Table C3.9)

- Site Stabilization and Long-Term Surveillance (Table C3.10)
- Total Work Days by Labor Category (Table C3.11)
- Worker Unit Cost Schedule (Table D3.12)
- Total Labor Costs by Major Decommissioning Task (Table D3.13)
- Packaging, Shipping, and Disposal of Radioactive Wastes (Table C3.14)
- Equipment/Supply Costs (Table C3.15)
- Laboratory Costs (Table C3.16)
- Miscellaneous Costs (Table C3.17)
- Total Decommissioning Costs (Table C3.18)
- Estimated Volume of Annual Depleted Uranium Generated (Table C3.19)
- Total Labor Distribution (Table C3.20)

Chapter 10.0 of the License Application for the American Centrifuge Plant describes specific features that serve to minimize the level and spread of radioactive contamination during operation that simplify the eventual plant decommissioning and minimize worker exposure. The decommissioning estimated costs are based on decontaminating the plant to the radiological criteria for unrestricted use in 10 CFR 20.1402. The total estimated cost of plant decommissioning in 2004 dollars, excluding tails disposition costs, is \$261.3 million (Table C3.18).

The following assumptions are utilized in the decommissioning cost estimate:

- No credit is taken for salvage value of equipment or materials;
- Inventories of materials and wastes at the time of decommissioning will be in amounts that are consistent with routine plant conditions and operations over the 30-year license;
- Decommissioning activities take place immediately on cessation of operations without multiyear storage-for-decay periods; and

Cost estimates to dispose of  $UF_6$  tails generated during ACP operation are presented in Table C3.19. The ultimate disposal of  $UF_6$  tails is to be determined. USEC intends to evaluate possible commercial uses of  $UF_6$  tails.  $UF_6$  tails, which are not commercially reused, will be converted to a stable form and disposed of in accordance with the USEC Privatization Act and other applicable statutory authorizations and requirements at DOE's  $DUF_6$  conversion facilities and/or other licensed facilities.  $UF_6$  tails are stored in steel cylinders until they can be processed

in accordance with the disposal strategy established and selected by USEC. Depending on technological developments and the existence of facilities available prior to ACP shutdown, the tails may have commercial value and may be marketable for further enrichment or other processes. However, for the purposes of calculating the UF<sub>6</sub> tails disposition costs, USEC assumes that the total quantity of tails generated during ACP operation are processed by the DOE DUF<sub>6</sub> conversion facility in Piketon, Ohio.

USEC provides financial assurance to incrementally fund the estimated cost of conversion and disposal of the UF<sub>6</sub> tails inventory as it is generated during ACP operation. The estimated cost of conversion and disposal is based on the actual accumulated depleted uranium inventory and a conservative forecast of the amount of depleted uranium to be generated for the upcoming period of operation. This funding is in addition to the funding requirements for decommissioning the ACP as described above.

At full capacity, the ACP will generate approximately 9,520 MT of UF<sub>6</sub> tails annually. USEC estimates that it will take approximately four years for the ACP to ramp up to the full capacity of 3.5 million SWU per year.

Our examination of the available information has identified that the unit cost to dispose of tails for the ACP could range between \$3.00/kilogram (kg) uranium (U) to \$4.83/kg U, depending on a number of factors and assumptions. The unknown factors include: location(s) for processing USEC depleted uranium, transportation costs, escalation rate(s) of various construction cost components; de-escalation rate(s) of future operating costs (to present day dollars); volume of tails disposed; revenue/avoided disposal cost from sale of conversion products (e.g., hydrogen fluoride) or higher assay tails (tail stripping); construction and operations budget contingencies; allocation of decontamination and decommissioning costs (between USEC and DOE); and DOE oversight costs.

USEC has developed the tails disposal cost estimate for the ACP based on the estimated cost of disposal provided in the DOE's March 1, 2005 letter to LES. Based on this letter, we have calculated the estimated tails disposal cost for the ACP to be \$4.83/kg U subject to the review requirements specified in the license application. We believe that the \$4.83/kg U should be viewed as the conservative upper bound of the range mentioned above and is based on the DOE estimate of \$3.34/kg depleted UF<sub>6</sub> (\$4.91/kg U) less \$0.08 (the estimated cost avoidance of transportation of USEC tails to the DOE conversion facility). Based on the total estimated volume of depleted uranium generated over the 30-years of operation and the estimated cost for disposal, USEC's liability for disposal of depleted uranium is \$866.4 million in 2004 dollars. With a 10 percent contingency, this represents a total liability of \$953.0 million in 2004 dollars for 30-years of operation. Although a total liability is provided, USEC will incrementally fund the estimated costs associated with disposal of the depleted uranium inventory as the depleted uranium is generated during ACP operation.

USEC's total decommissioning liability is the sum of the total plant decommissioning costs and the tails disposition costs. USEC's total liability for decommissioning the ACP, including applicable contingencies, is \$1,214.4 million.

#### 4.0 DECOMMISSIONING FUNDING MECHANISM

USEC presently intends to utilize a surety bond to provide reasonable assurance of decommissioning funding, pursuant to 10 CFR 70.25(f). Accordingly, USEC provides with this application model documentation related to the use of the surety method of providing decommissioning financial assurance.<sup>2</sup> However, as described in Section 1.0 of this plan, USEC may choose to utilize alternate financial assurance funding methods. Upon finalization of the specific funding instruments to be utilized and at least 90 days prior to the commencement of enrichment operations, USEC will supplement its application to include the signed, executed documentation.

As noted above, USEC presently intends to utilize a surety bond to provide financial assurance for decommissioning. The surety bond will provide an ultimate guarantee that decommissioning costs will be paid in the event USEC is unable to meet its decommissioning obligations at the time of decommissioning. A copy of a model surety bond is provided in Appendix A to this plan. USEC describes below the particular attributes it presently anticipates including in the surety bond.

With respect to the surety bond, USEC presently anticipates providing for the following attributes: First, a company that is listed as a qualified surety in the Department of Treasury's most recent edition of Circular 570 for the State where the surety was signed with an underwriting limitation greater than or equal to the level of coverage specified in the bond will issue the bond. Second, the bond will be written for a specified term and will be renewable automatically unless the issuer serves notice at least 90 days prior to expiration of intent not to renew. Such notice must be served upon the NRC, the trustee of the external or standby trust, and USEC. Further, in the event USEC is unable to provide an acceptable replacement within 30 days of such notice, the full amount of the bond will be payable automatically, prior to expiration, without proof of forfeiture.

The surety bond will require that the surety company will deposit any funds paid under its terms directly into either an external trust or a standby trust. A copy of a model standby trust is provided as Appendix B to this plan.

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<sup>2</sup> The model documentation is derived from Appendix A.9 in NUREG-1757 Volume 3, Consolidated NMSS Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness, September 2003. USEC will consider this model documentation as guidance in preparing and executing funding instruments for the ACP. In the event USEC ultimately selects another form of decommissioning funding, model documentation from this volume of NUREG-1757 will also be used as guidance in the preparation of funding instruments.

## 5.0 ADJUSTING DECOMMISSIONING COSTS AND FUNDING

Pursuant to 10 CFR 70.25(e), USEC will update the decommissioning cost estimate for the ACP and the financial assurance over the life of the plant. The modular aspect of the American Centrifuge technology allows enrichment operations to begin well before the full capacity of the plant is reached. Thus, the decommissioning liability is incurred incrementally as more centrifuge machines, and associated equipment, are added to the process, until such time as full capacity of the facility (i.e., 3.5 million SWU) is achieved. Once full capacity of the facility is achieved, the UF<sub>6</sub> tails are generated at a relatively constant rate throughout the life of the plant.

To ensure adequate financial assurance is in place as centrifuge machines, and associated equipment, are added to the process and placed into operation, USEC will update the cost estimates for decommissioning and UF<sub>6</sub> tails disposal and provide a revised funding instrument to NRC prior to operation of additional incremental capacity on process gas. Once full capacity of the facility is achieved, USEC will annually adjust the cost estimate for UF<sub>6</sub> tails disposal and all other decommissioning costs will be adjusted periodically, and no less frequently than every three years, consistent with the requirements of 10 CFR 70.25(e) and the recent NRC final rule regarding financial assurance for materials licensees (68 FR 57327, October 3, 2003). The method for adjusting the cost estimate will consider the following:

- Changes in general inflation (e.g., labor rates, consumer price index)
- Changes in price of goods (e.g., packing materials)
- Changes in price of services (e.g., shipping and disposal costs)
- Changes in plant condition or operations
- Changes in decommissioning procedures or regulations

A record of the updating effort and results will be retained for review (see further discussion regarding record keeping below). The NRC will be notified of any material changes to the decommissioning cost estimate and associated funding levels (e.g., significant increases in costs beyond anticipated inflation or the price of goods and services). To the extent the underlying instruments are revised to reflect changes in funding levels, the NRC will be notified as appropriate.

## 6.0 RECORD KEEPING PLANS RELATED TO DECOMMISSIONING FUNDING

Pursuant to 10 CFR 70.25(g), USEC will keep records of information that could have a material effect on the ultimate costs of decommissioning until termination of the license. Information maintained in these records includes:

- Records of spills or other unusual occurrences involving the spread of contamination in and around the plant, equipment, or site. Records of spills or other unusual

occurrences may be limited only to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records will include any known information on identification of involved radionuclides, quantities, forms, and concentrations;

- As-built drawings and modifications of structures and equipment in areas where radioactive materials are used and/or stored, including locations that possibly could be inaccessible (e.g., buried pipes which may be subject to contamination); and

A list contained in a single document that is updated every two years of the following:

- Areas designated and formerly designated as restricted areas as defined under 10 CFR 20.1003.
  - Areas outside of restricted areas that require documentation under 10 CFR 70.25(g)(1).
  - Areas outside of restricted areas where current and previous wastes have been buried as documented under 10 CFR 20.2108.
  - Areas outside of restricted areas that contain material such that, if the license expired, USEC would be required to either decontaminate the area to meet the criteria for decommissioning in 10 CFR Part 20, Subpart E or would apply for NRC approval for disposal under 10 CFR 20.2002.
- Records of the cost estimate performed for the DFP, and records of the funding method used for assuring funds, including a copy of the financial assurance mechanism and any supporting documentation.

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Table C3.17 Miscellaneous Costs

Other Direct Costs

Cost Item	Total Cost
Miscellaneous Material for DeCon <sup>1</sup>	\$2,500,000
<b>Total</b>	<b>\$2,500,000</b>

Note 1: Estimate based upon percentage of Decommissioning Cost subtotal (1.5% Direct Labor and Equipment) (C3.18).

Other Indirect Costs

Cost Item	Total Cost
NRC Staff Review and Approval DP <sup>2</sup>	\$80,000
License Fees <sup>3</sup>	\$18,600,000
DOE Lease	\$6,000,000
Business Ins	\$ 300,000
Taxes	\$ 180,455
<b>Total</b>	<b>\$25,160,455</b>

Note 2: Estimate based upon review and approval for Decommissioning Plan (DP).

Note 3: Estimate based upon NRC Annual Operational Fees for plant.

Table C3.18 Total Decommissioning Costs

Task	Calculated Costs	Percentage
Planning and Preparation	\$ 2,581,596	2%
Decontamination and/or Dismantling of Radioactive Facility Components	\$ 42,494,150	24%
Restoration of Contaminated Areas on Facility Grounds	\$ 755,126	1%
Final Radiation Survey	\$ 1,077,169	1%
Site Stabilization and Long-Term Surveillance	\$ 2,522,050	1%
Indirect Services	\$ 33,642,196	19%
Packaging, Shipping, and Waste Disposal Costs	\$ 47,511,280	27%
Equipment/Supply Costs	\$ 14,973,409	9%
Laboratory Costs	\$ 1,353,198	1%
Other Direct Costs	\$ 2,500,000	1%
Other Indirect Costs	\$ 25,160,455	14%
<b>Subtotal</b>	<b>\$174,570,628</b>	<b>100%</b>
G&A (6%)	\$ 10,474,238	
Contractor Profit (15%)	\$ 24,054,730	
Contingency (25%)	\$ 52,274,899	
<b>Total Labor &amp; Materials Cost</b>	<b>\$261,374,495</b>	
Tails Disposal Cost	\$866,389,098	
Tails Contingency (10%)	\$ 86,638,910	
<b>Total Tails Disposal Cost</b>	<b>\$953,028,008</b>	
<b>Total Decommissioning Cost Estimate (Including Tails Disposal)</b>	<b>\$1,214,402,503</b>	

Table C3.19 Estimated Volume of Annual Depleted Uranium Generated

Calendar Year	[Q] # Machines	[R] DUF <sub>6</sub> Generated [1,000 MT]	[S] DUF <sub>6</sub> Accumulated [1,000 MT]	[T] DU Accumulated [1,000 MT]	[U] Tails Disposal Cost [\$M, 2004]	[V] # Tails Cylinders
2006	200	0	0	0	\$0	0
2007	120	0.099	0.099	0.067	\$323,722	8
2008	2,700	2.23	2.33	1.51	\$7,283,754	179
2009	7,300	6.03	8.36	4.08	\$19,693,114	483
2010	11,520	9.52	17.88	6.43	\$31,077,352	763
2011-2036	11,520	247.43	265.30	167.29	\$808,011,156	19,836
Total		265.30	265.30	179.38	\$866,389,098	21,269

Assumptions: Operational (license) life = 30 years (from 2006 - 2036); 365 days/yr; 24 hr/day  
 Tails Output during Operation (@ 3,500 MTSWU/yr) = 2,395 lbs. UF<sub>6</sub>/hr  
 Weight Conversion Factor = 0.45359 kg/lb; Tails Material Conversion Factor = 0.30668 kg/lb UF<sub>6</sub>; Tails Purity = 0.67612 gU/g; based upon 0.35% Average Tails  
 U disposal cost = \$4.83/kg U  
 $R = Q/11,520 * \text{number of years} * 2,395 * 24 * 365$ ;  $T = R * 0.67612$ ;  $U = T * 4.83$   
 $V = R * 1,000,000 / 0.45359 / 27,500$   
 ~21,269 Tails cylinders generated; 27,500 # UF<sub>6</sub> fill weight = 1,000 generated parent cylinders (@ EOL)

Table C3.20 Total Labor Distribution

Group		Type	Job/Personnel Descriptions
Supervision		Salary	Program Manager, Project Manager, Office Manager, QA/Reg Manager, Rad-Environmental-Safety and Health Manager, FNMCA Manager
Engineering		Salary	Design Engineer, Field Support, NCS Engineer, Nuclear Safety, Regulatory
Operations		Salary	Operations FLM
		Hourly	Chemical Operations, UMH
Maintenance		Salary	Maintenance FLM, Scheduler-Planner
		Hourly	Mechanic, Laborer, Field Service Technician
Support	Plant Support	Salary	HP Support
		Hourly	Protection Forces
	Production Support	Salary	Waste Engineer
		Hourly	Waste Handler

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Reviewer: R. Coriell

Date: 09/02/05