

June 22, 2005 AET 05-0040

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 Changed Pages for the License Application for the American Centrifuge Plant (TAC Nos. L32306, L32307, and L32308)

Dear Mr. Strosnider:

Pursuant to Reference 1, USEC Inc. (USEC) hereby submits to the U.S. Nuclear Regulatory Commission (NRC) changed pages for Chapter 10.0 of the License Application and the Decommissioning Funding Plan to include a wage escalation to the labor estimates.

Enclosure 1 to this letter provides changed pages for the License Application and Decommissioning Funding Plan (Non-Proprietary Information). Changes from the previous revision submitted to the NRC are designated with revision bars in the right hand margin. Proprietary changes to the Decommissioning Funding Plan are being submitted under separate cover (AET 05-0050).

USEC completed the review of Enclosure 1 in relation to the December 21, 2004 NRC Review Criteria to Identify Sensitive Information in Fuel Cycle Documents.

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Mr. Jack R. Strosnider June 22, 2005 AET 05-0040, Page 2

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

Sincerely,

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S. A. 1\_

Steven A. Toelle Director, Nuclear Regulatory Affairs

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

Enclosures: As Stated

Reference:

 USEC Letter AET 05-0038 from S.A. Toelle (USEC) to J.R. Strosnider (NRC) regarding "Submittal of Additional Information to Request for Additional Information – License Application for the American Centrifuge Plant (TAC Nos. L32306, L32307, and L32308)," dated May 23, 2005

# Enclosure 1 to AET 05-0040

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Changed Pages for the License Application and Decommissioning Funding Plan (Non-Proprietary Information)

# Remove and Insert Instructions American Centrifuge Plant June 2005

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Remove and Properly Destroy	Insert	
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LA-3605-0001

# **License Application**

for the American Centrifuge Plant

in Piketon, Ohio



**Revision 5** 

Docket No. 70-7004

**June 2005** 

Information contained within does not contain Export Controlled Information

Reviewer: <u>D. Hupp</u> Date: <u>06/21/05</u> Blank Page

#### LA-3605-0001

# LICENSE APPLICATION

# for the American Centrifuge Plant in Piketon, Ohio

Docket No. 70-7004

**Revision 5** 

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Reviewer: <u>D. Hupp</u> Date: <u>06/21/05</u> Blank Page

#### **Revision 5**

# UPDATED LIST OF EFFECTIVE PAGES

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.

Revision 1 – 10 CFR 1045 review completed by L. Sparks on 03/04/05 and the Export Controlled Information review completed by R. Coriell on 03/10/05.

Revision 2 - 10 CFR 1045 review completed by J. Weidner on 04/29/05 and the Export Controlled Information review completed by R. Coriell on 04/29/05.

Revision 3 - 10 CFR 1045 review completed by J. Weidner on 05/23/05 and the Export Controlled Information review completed by R. Coriell on 05/23/05.

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.

Revision 5 - 10 CFR 1045 review completed by J. Weidner on 06/21/05 and the Export Controlled Information review completed by D. Hupp on 06/21/05.

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- Changes in plant condition or operations; and
- Changes in decommissioning procedures or regulations.

These costs are estimated as explained below:

#### Planning and Preparation: \$2.6 million

Scope to be completed in one year and includes developing and submitting a detailed DP as a license amendment for NRC review and approval. Activities anticipated during this phase include:

- Develop Project Execution Plan and Schedule (including the organization and staffing plan and needed services);
- Develop and submit the Decommissioning Plan;
- Develop/implement Site Characterization Plan;
- Review/approve Site Decommissioning Plan by the NRC;
- Develop Decommissioning Activity Procedures; and
- Design Decommissioning Service Area (DSA).

#### Decontamination and/or Dismantling of Radioactive Facilities: \$42.5 million

This is based upon utilizing salary and hourly workers at their respective average cost over a five-year duration. For conservatism, decommissioning estimated costs are based on decontaminating the plant to the radiological criteria for unrestricted use in 10 CFR 20.1402. Activities anticipated during this phase include:

- Prepare the decontamination Service Area;
- Internal decontamination of facilities;
- Dismantle centrifuge machines to include waste segregation and staging;
- Dismantle facilities and components; and
- Tails cylinder movement/disposition to include material title transfer to DOE.

## Restoration of Contaminated Areas On Plant Grounds: \$0.8 million

This is based upon utilizing salary and hourly workers at their respective current average cost distribution over a two-year duration. This assumes the contamination of the plant grounds from the ACP operations will be minimal. Activities anticipated during this phase include:

- External decontamination of facilities;
- Perform Health Physics surveys;
- Scarify cylinder storage yard surfaces; and
- Collect/dispose of yard debris.

# Final Status Survey: \$1.1 million

This is based upon utilizing salary technicians at their current average cost distribution for a period of 2.5 years. Costs do not include any NRC confirmatory surveys to verify the results of the Final Status Survey. Activities anticipated during this phase include:

- Develop/implement survey plans;
- Collect/analyze data;
- Perform confirmatory surveys;
- Develop final survey report; and
- Prepare License Amendment to terminate the license.

# Site Stabilization and Long-Term Surveillance: \$2.5 million

As previously stated, the intent of decommissioning is to return the plant to the radiological criteria for unrestricted use. To accomplish this activity, stabilization and surveillance is required due to the number of components involved and the duration of the decommissioning effort. This scope of work occurs throughout the six year decommissioning period and involves maintenance and surveillance activities on IROFS, as required, until the license is terminated

# Packing Materials, Shipping, and Waste Disposal: \$47.5 million

This is based upon shipping and disposal of the internals for 12,000 centrifuge machines (which includes operating machines as well as contaminated spares), feed and withdrawal equipment, and other components totaling approximately 60,000 cubic feet of solid waste, 16,000 gallons of

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.

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

#### **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 \$591.9 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
UF <sub>6</sub> Tails Disposition Cost	\$591.9 million
Total Decommissioning Liability	\$853.3 million

<u>Task/Item</u>	Cost Estimate (Millions, 2004 dollars)	Approx Percentage
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%)	10.4	
Contractor Profit (15%)	24.0	
Contingency (25%)	\$52.2	
Total Plant Decommissioning Cost	\$261.3	
UF6 Tails Disposal Costs	\$538.1	
UF6 Tails Contingency (10%)	53.8	
Total UPo Talls Disposition Cost	\$281.8	<u> </u>
Total Decommissioning Liability	\$853.3	

# Table 10.10-1 Plant Decommissioning Cost Estimates and Expected Duration

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# Decommissioning Funding Plan

# for the American Centrifuge Plant

in Piketon, Ohio



#### **Revision 3**

Docket No. 70-7004

Information contained within does not contain Export Controlled Information

June 2005

Reviewer: <u>D. Hupp</u> Date: <u>06/21/05</u> **Blank Page** 

NR-3605-0006

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

Docket No. 70-7004

#### **Revision 3**

Information contained within does not contain Export Controlled Information

Reviewer: <u>D. Hupp</u> Date: <u>06/21/05</u> **Blank Page** 

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#### **UPDATED LIST OF EFFECTIVE PAGES**

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.

Revision 1 - 10 CFR 1045 review completed by L. Sparks on 03/07/05 and the Export Controlled Information review completed by R. Coriell on 03/10/05.

Revision 2 - 10 CFR 1045 review completed by J. Weidner on 05/23/05 and the Export Controlled Information review completed by R. Coriell on 05/23/05.

Revision 3 - 10 CFR 1045 review completed by J. Weidner on 06/21/05 and the Export Controlled Information review completed by D. Hupp on 06/21/05.

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Revision 1

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- 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<sub>6</sub> tails generated during ACP operation are presented in Table C3.19. The ultimate disposal of UF<sub>6</sub> tails is to be determined. USEC intends to evaluate possible commercial uses of UF<sub>6</sub> tails. UF<sub>6</sub> 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<sub>6</sub> conversion facilities and/or other licensed facilities. UF<sub>6</sub> 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  $UF_6$  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  $UF_6$  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.

The current estimated cost for disposal of depleted uranium is estimated to be \$3.00 per kilogram of uranium (kgU). This cost for disposal is based upon the cost in the DOE/USEC Agreement of June 30, 1998<sup>2</sup>. USEC has compared this cost for disposal of depleted uranium against cost information from the DOE contract for the conversion facilities currently being constructed at Piketon, Ohio and Paducah, KY as well as the proposal to build and operate the uranium hexafluoride conversion facilities for DOE, submitted by the American Conversion Services (ACS) partnership, which included USEC. This proprietary ACS proposal was based on comprehensive cost projections developed by the partnership. The ACS proposal and the DOE conversion facilities cost information support the \$3.00 per kgU disposal cost for depleted uranium used in this plan. 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 \$538.1 million in 2004 dollars. With a 10 percent contingency, this represents a total liability of \$591.9 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 \$853.3 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

<sup>&</sup>lt;sup>2</sup> Memorandum of Agreement between the United States Department of Energy and the United States Enrichment Corporation Relating to Depleted Uranium, dated June 30, 1998.

# Table C3.17 Miscellaneous Costs

# **Other Direct Costs**

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

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
Total	\$25,160,455

Note 2: Estimate based upon review and approval for Decommissioning Plan (DP). Note 3: Estimate based upon NRC Annual Operational Fees for plant.

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Task	Calculated Costs	Percentage
Planning and Preparation	\$ 2,581,596	2%
Decontamination and/or Dismantling of Radioactive	\$ 12 191 150	24%
Restoration of	\$ 72,797,130	2470
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%
Subtotal	\$174,570,628	100%
$\frac{G\alpha A (0\%)}{G\alpha A (0\%)}$	\$ 10,474,238	
Contractor Profit (15%)	\$ 24,054,730	
Contingency (25%)	\$ 52,274,899	
Cost	\$261,374,495	
Tails Disposal Cost	\$538,129,875	
Tails Contingency (10%)	\$ 53,812,987	
Total Tails Disposal Cost	\$591,942,862	
Total Decommissioning Cost Estimate (Including Tails Disposal)	\$853,317,357	

# Table C3.18 Total Decommissioning Costs

			I			·
Calendar Year	[Q] # Machines	[R] DUF6 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	\$201,070	8
2008	2,700	2.23	2.33	1.51	\$4,524,071	179
2009	7,300	6.03	8.36	4.08	\$12,231,748	483
2010	11,520	9.52	17.88	6.43	\$19,302,703	763
2011-2036	11,520	247.43	265.30	167.29	\$501,870,283	19,836
Total	· · ·	265.30	265.30	179.38	\$538,129,875	21,269

Table C3.19 Estimated Volume of Annual Depleted Uranium Generated

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 = 3/KgU

R=Q/11,520\*number of years\*2,395\*24\*365; T=R\*0.67612; U=T\*3

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)

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Group		Туре	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	
Operations		Hourly	Chemical Operations, UMH	
		Salary	Maintenance FLM, Scheduler-Planner	
Maintenance		Hourly	Mechanic, Laborer, Field Service Technician	
	Plant Support	Salary	HP Support	
		Hourly	Protection Forces	
Support	Production	Salary	Waste Engineer	
	Support	Hourly	Waste Handler	

# Table C3.20 Total Labor Distribution

Information contained within does not contain Export Controlled Information

Reviewer: <u>D. Hupp</u> Date: <u>06/21/05</u>