June 3, 2005
AET 05-0041

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

Dear Mr. Strosnider:

USEC Inc. (USEC) hereby submits to the U.S. Nuclear Regulatory Commission (NRC) additional information related to Attachment 1 of Reference 1.

Enclosure 1 to this letter provides additional information related to USEC's responses concerning the topic of Environmental Protection. Enclosure 2 of this letter provides the standards and guidelines used in response to the topics of Instrumentation and Control and Electrical submitted to the NRC under separate cover (AET 05-0042).

Enclosures 1 and 2 have been determined, in accordance with the guidance provided by the U.S. Department of Energy, to not contain Export Controlled Information. Enclosures 1 and 2 have been reviewed in accordance with the December 21, 2004 NRC Review Criteria to Identify Sensitive Information in Fuel Cycle Documents.

NMSS01

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

Sincerely,

S. A. Toelle

Steven A. Toelle
Director, Nuclear Regulatory Affairs

cc: Y. Faraz, NRC HQ
J. Henson, NRC Region II
B. Smith, NRC HQ

Enclosures: As Stated

Reference:

1. NRC memorandum to James W. Clifford (NRC) from Yawar Faraz (NRC) regarding Telephone Summaries: USEC Inc. Clarification of Responses to Requests for Additional Information on Proposed American Centrifuge Plant," dated May 20, 2005.

Enclosure 1 to AET 05-0041

Additional Responses to Attachment 1 of the Telephone Summaries dated May 20, 2005 (Environmental Protection)

Enclosure 1 of AET 05-0041

Environmental Protection

1. NRC's RAI EP-4 requested USEC to briefly describe and provide a citation for the integrity assurance plan for storage tanks. Section 9.2.1.2.2 of the license application refers to an "integrity assurance plan" that is used to assure that tanks are not leaking. According to USEC's response, this plan has not been developed as yet. The NRC requested USEC in the subject phone call to commit to completing this document and to incorporating it in Chapter 9 as a reference prior to the NRC's preoperational inspections.

   USEC agreed to briefly describing and providing a citation for the integrity assurance plan in Chapter 9 of the license application after the plan is finalized, which would be prior to the NRC's pre-operational inspections.

USEC Response

An integrity assurance plan will be developed by Engineering to assure that the tanks are not leaking as the ACP takes possession of them. This plan will be completed and will be added to the License Application as a reference prior to the NRC's pre-operational inspections. Following completion of this integrity assurance plan, inventory monitoring of the tank contents will be used to detect leaks from the Liquid Effluent Collection System.

Section 9.2.1.2.2 of the License Application will be revised to add the commitment for completing the integrity assurance plan and adding to the License Application as a reference.

Enclosure 2 to AET 05-0041

Standards and Guidelines Used in Response to the Topics of Instrumentation and Control and Electrical - Submitted to the NRC Under Separate Cover (AET 05-0042)

Enclosure 2 of AET 05-0041

Standards and Guidelines

Response Table related to Instrumentation and Control: Request for Additional Information (RAI) Number/Standard Referenced [1]

RAI No.	APPLICABLE STANDARDS
IC-1	Institute of Electrical and Electronics Engineers (IEEE) 7-4.3.2, 308, 323, 338, 379, 384, 446, 603, 1050
IC-2	IEEE 7-4.3.2, 308, 323, 338, 379, 384, 446, 603, 1050
IC-3	ISA 67.04.01
IC-4	IEEE 7-4.3.2
IC-5	IEEE 308, 338
IC-7	IEEE 384, 603
IC-8	IEEE 384, 603
IC-10	IEEE 384, 603
IC-14	IEEE 7-4.3.2
IC-15	IEEE 603

Response Table related to Electrical: RAI Number/Standard Referenced [1]

RAI No.	APPLICABLE STANDARDS
ES-1	IEEE 7-4.3.2, 308, 323, 336, 338, 379, 384, 446, 603, 1050
ES-2	IEEE 7-4.3.2, 308, 446, 603, 1050
ES-3	IEEE 308, 446, 1050
ES-4	IEEE 7-4.3.2, 308, 323, 336, 338, 379, 384, 603, 1050

[1] See Section 1.4 of the License Application for USEC commitments to standards

IEEE 7-4.3.2-1993 *Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations*

IEEE 7-4.3.2 Clauses 1 (Scope), 3 (Definitions), and 7 (Execute Features); and portions of Clauses 5 (Safety System Criteria), 6 (Sense and Command Features), and 8 (Power Source Requirements) have useful content that may be applicable to the ACP. Note that IEEE-7.4.3.2 supplements IEEE 603.

The exceptions that USEC takes to the contents of IEEE 7-4.3.2 Clauses 5, 6, and 8 are:

Sections 5.3 and 5.3.1	USEC commits to ASME NQA-1-1994 Part II, Subpart 2.7, Basic Requirement 11 as defined in License Application Section 1.4.3.
Section 5.3.2	USEC does not intend to qualify existing commercial computers.
Section 5.15	Reliability analysis methods and calculations are as specified in the ACP ISA and ISA Summary.

IEEE 7-4.3.2 Clauses 2 (References) and 4 (Safety System Design Basis) are not considered to be applicable or necessary due to their nuclear reactor content and redundancy with other IEEE standards and USEC's Integrated Safety Analysis (ISA) and ISA Summary.

Note that Annexes A through H provide only "informative" details and references.

IEEE 308-2001 *Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations*

This standard provides criteria and requirements for the Class 1E electrical power systems of nuclear power generating stations that specifically relate to providing protection for the health and safety of the public.

The American Centrifuge Plant (ACP) electrical Items Relied on for Safety (IROFS) systems will be redundant and utilize commercial-grade equipment approved or rated by nationally recognized industry standards and reputable organizations such as IEEE, UL, FM, NFPA, and NEMA. Procurement and installation will be in accordance with NR-3605-0001 Quality Assurance Program Description.

Class 1E equipment will be used only in electrically related IROFS systems that are not "failsafe;" therefore, require electrical power to perform their intended safety functions (e.g., ISA Summary IROFS 7.3.3.4). In other words, it is anticipated that few of the numerous ACP safety systems will be classified as Class 1E. Any Class 1E equipment required for the ACP will be procured either with the Class 1E rating or it will be classified as such in accordance with applicable portions of IEEE 323; required documentation will be maintained throughout the qualified life of the Class 1E equipment.

IEEE 308 Section 3 (Definitions) and portions of Sections 1 (Overview), 4 (Principle Design Criteria), 5 (Supplemental Design Criteria), 6 (Surveillance and Test requirements), and 8 (Documentation) have useful content that may be applicable to the ACP.

Clarifications and exceptions that USEC takes to the contents of IEEE 308 are:

Section 1	Figure 1 is not applicable to the ACP. USEC will provide reliable electrical power from an Electrical Motor Control Center (EMCC) or Uninterruptible Power Supply (UPS) to all IROFS that require electrical power to function during postulated events analyzed in the ISA. Note that IROFS that fail safe on loss of power do not require these types of power systems.
Section 2	The ACP does not commit to all of the standards listed in this section.
Section 4.2	Figure 3 is not applicable to the ACP. USEC will provide reliable electrical power from an EMCC or UPS to all IROFS that require electrical power to function during postulated events analyzed in the Integrated Safety Analysis. Note that IROFS that fail safe on loss of power do not require these types of power systems.
Section 4.7	Documents will be identified and controlled in accordance with Sections 6.0 and 17.0 of NR-3605-0001 Quality Assurance Program Description and plant procedures.
Section 4.10 and 5.2.1	These Sections are not applicable to the ACP as written and are modified as follows: an EMCC with one standby generator or a UPS system may be utilized to provide reliable power to an IROFS that requires electrical power to function during postulated events analyzed in the Integrated Safety Analysis. These units will be located indoors and are very reliable. The power circuits from the EMCC or UPS to the IROFS will be independent and redundant. The control circuits from the control room to the IROFS will also be independent and redundant.
Section 4.11	A non-Class 1E load that needs reliable standby power may be connected to a Class 1E power system in accordance with portions of Figure 3 and IEEE 384.
Section 5.2.4 and 5.3.1	These Sections are not applicable to the ACP. The ACP will follow applicable portions of IEEE 446 for guidance related to standby power supplies and DC power systems.
Section 5.3.3.6	Battery systems for IROFS that are not failsafe will be tested in accordance with approved ACP maintenance procedures.

Section 6.1	The "illustrative" continuous monitoring surveillance methods listed in Table 3 are optional, i.e. surveillance monitoring by a computer is not mandatory.
Section 7	This Section does not apply to a uranium enrichment facility.
Section 8.1	The ACP does not commit to performing and documenting the various studies listed as Items a through g in the second paragraph. The design of Class 1E power systems will be in accordance with applicable portions of the applicable industry standards.

IEEE 323-2003 *Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations*

This standard describes the basic requirements for qualifying Class 1E equipment and interfaces that are used in nuclear power plants.

The ACP electrical IROFS systems will be redundant and utilize commercial-grade equipment approved or rated by nationally recognized industry standards and reputable organizations such as IEEE, UL, FM, NFPA, and NEMA. Procurement and installation will be in accordance with NR-3605-0001 Quality Assurance Program Description.

Class 1E equipment will be used only in electrically related IROFS systems that are not "failsafe" and, therefore, require electrical power to perform their intended safety functions (e.g. ISA Summary IROFS 7.3.3.4). In other words, it is anticipated that few of the numerous ACP safety systems will be classified as Class 1E. Any Class 1E equipment required for the ACP will be procured either with the Class 1E rating or it will be classified as such in accordance with applicable portions of IEEE 323; required documentation will be maintained throughout the qualified life of the Class 1E equipment.

IEEE 323 Clauses 1 (Scope), 3 (Definitions), 4 (Principles), 5 (Methods), 6 (Program), and 7 (Documentation) have useful content that may be applicable to the ACP.

Note that Annex A provides only "informative" references (37) and that only certain portions of the two IEEE standards (7-4.3.2 and 603) listed in Clause 2 (References) may be applicable to the ACP.

IEEE 336-1985 *Standard Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities*

This standard describes the basic requirements for installation, inspection and testing of power, instrumentation and control equipment in nuclear facilities. Additionally, applicable portions of Clauses 7, 8, 9, and 10 may be used in conjunction with Section 11.0 of NR-3605-0001 Quality Assurance Program Description and applicable Maintenance Procedures for post-construction activities to assure that installed systems are functional.

The exception that USEC takes to the contents of IEEE 336 is:

Clause 2	The ACP does not commit to all of the standards listed in this clause.

IEEE 338-1987 *Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems*

This standard supplements IEEE 603 by providing guidance for the development of procedures and documentation for testing safety systems in nuclear power stations.

IEEE 338 Sections 1 (Scope), 2 (Definitions), 4 (Basis), and 5 (Design Requirements); and portions of Sections 3 (References) and 6 (Testing Program Requirements) have useful content that may be applicable to the ACP.

The exceptions that USEC takes to the contents of IEEE 338 Sections 3 and 6 are:

Section 3	The ACP Operations Procedures will govern plant operations in lieu of ANSI/ANS 3.2-1982.
Section 3	In Section 3 (References) USEC commits to only the applicable portions of the IEEE Standards 7-4.3.2 and IEEE 603.
Section 6.1 (11)	The ACP Operations Procedures will govern plant operations in lieu of ANSI/ANS 3.2-1982.

Note that Annex A provides only "informative" references.

IEEE 379-2000 *Standard Application of the Single-Failure Criterion to Nuclear Power Generating Station Safety Systems*

This standard supplements IEEE 603 by providing guidance in the application of the single-failure criterion for safety systems in nuclear power stations. Applicable portions of IEEE 379 will be used as a guideline for the design of IROFS systems.

IEEE 379 Sections 1 (Overview), 3 (Definitions), 5 (Requirements), 6 (Design Analysis), and portions of Section 4 (Single-Failure Criterion) have useful content that may be applicable to the ACP.

The exceptions that USEC takes to the contents of IEEE 379 are:

Section 2	The ACP does not commit to all of the standards listed in this section.
Section 4	An EMCC with one standby generator or a UPS system may be utilized to provide reliable power to an IROFS that requires electrical power to function during postulated events analyzed in the Integrated Safety Analysis. These units will be located indoors and are very reliable. The power circuits from the EMCC or UPS to the IROFS will be independent and redundant. The control circuits from the control room to the IROFS will also be independent and redundant.

Note that Annex A provides only "informative" references.

IEEE 384-1992 *Standard Criteria for Independence of Class 1E Equipment and Circuits*

This standard supplements IEEE 603 by providing criteria for implementation of the independence requirements for Class 1E systems.

The ACP electrical IROFS systems will be redundant and utilize commercial-grade equipment approved or rated by nationally recognized industry standards and reputable organizations such as IEEE, UL, FM, NFPA, and NEMA. Procurement and installation will be in accordance with NR-3605-0001 Quality Assurance Program Description.

Class 1E equipment will be used only in electrically related IROFS systems that are not "failsafe;" therefore, require electrical power to perform their intended safety functions (e.g., ISA Summary IROFS 7.3.3.4). Any Class 1E equipment required for the ACP will be procured either with the Class 1E rating or it will be classified as such in accordance with applicable portions of IEEE 323; required documentation will be maintained throughout the qualified life of the Class 1E equipment.

IEEE 384 Clauses 1 (Scope), 2 (Purpose), 4 (Definitions), 5 (Independence Criteria), 6 (Separation Criteria), and 7 (Specific Isolation Criteria) may be applicable to the ACP.

The exception that USEC takes to the contents of IEEE 384 is:

Clause 3	The ACP does not commit to all of the standards listed in this clause.

Note that Annex A provides only "informative" references.

IEEE 446-1995 *Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications*

IEEE 446 Chapters 1 (Scope) and 2 (Definitions) and portions of Chapters 6 (Protection), 7 (Grounding), 8 (Maintenance), and 10 (Reliability) have useful content that may be applicable to the ACP.

The exceptions that USEC takes to the contents of IEEE 446 Chapters 6, 7, 8, and 10 are:

Section 6.11 The ACP does not commit to all of the standards listed in this section.

Section 7.14 The ACP does not commit to all of the standards listed in this section.

Section 8.1.3 Maintenance personnel will likely receive training onsite, not at the manufacturer's location. It is anticipated that ACP supervisory personnel will receive factory training and then develop an onsite training program to be utilized for onsite training of ACP maintenance personnel; additional onsite training provided by the manufacturer may be an option if deemed appropriate.

Section 8.4.3.a) 1) Battery charging system inspections are anticipated to be monthly in accordance with Table 8-1, not weekly.

Section 8.4.3.a) 2) The diesel-generator (D-G) system testing will not consist of full-load, weekly testing. A plant procedure for periodic testing of the D-G set will be developed in accordance with existing plant D-G testing practices based upon nearly 50 years operating experience and the D-G manufacturer's recommendations.

Section 8.5.2 Daily inspections of UPS systems will not be required; inspections are anticipated to be monthly in accordance with Section 8.5.2.b.

Section 8.5.2.a) The listed UPS "weekly inspection" items are anticipated to be monthly and included in the routine inspections listed in Section 8.5.2.b).

Section 8.6.1 A battery system maintenance procedure will be developed in accordance with existing plant battery system practices based upon nearly 50 years operating experience and the battery system manufacturer's recommendations. It is anticipated that general battery system inspections will be performed monthly in accordance with Table 8-1.

Section 8.9 The ACP does not commit to all of the standards listed in this section.

Section 10.4 a) through c)	The UPS final factory testing steps will be based upon the capacity (size) of the system, the precise type of batteries, the system configuration, and the intended function of the installed system.
Section 10.9	The ACP does not commit to all of the standards listed in this section.

IEEE 446 Chapters 3, 4, 5, and 9 are not considered to be applicable or necessary due to their content and/or redundancy with other IEEE standards and NFPA 70 National Electrical Code.

IEEE 518-1982 *Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources*

Commitment to IEEE 518 is not required because applicable portions of IEEE 1050 and accepted industry design practices will be utilized to minimize electrical noise in the ACP.

IEEE 603-1998 *Standard Criteria for Safety Systems for Nuclear Power Generating Stations*

IEEE 603 Clauses 1 (Scope), 3 (Definitions), and 7 (Execute Features); and portions of Clauses 5 (Safety System Criteria), 6 (Sense and Command Features), and 8 (Power Source Requirements) have useful content that may be applicable to the ACP. Note that for safety systems that utilize digital computers IEEE 603 is supplemented by IEEE 7-4.3.2.

The exceptions that USEC takes to the contents of IEEE 603 Clauses 5, 6, and 8 are:

Sections 5.3 and 5.3.1	USEC commits to ASME NQA-1-1994 Part II, Subpart 2.7, Basic Requirement 11 as defined in License Application Section 1.4.3.
Section 5.4	Qualification - Use and qualification of Class 1E equipment is specified in USEC's IEEE 323 comments.
Sections 5.6.1 and 5.6.2	USEC's goal is to design any safety system that might not survive all design basis events such that it is electrically failsafe (i.e. does not require electrical power to perform its intended safety function).
Section 5.15	Reliability analysis methods and calculations are as specified in the ACP ISA and ISA Summary. The ACP problem reporting system will be monitored and evaluated.
Section 6.2	Manual control requirements may not be applicable to all IROFS; the need will be evaluated during the design phase.
Section 8.1	Safety systems that are failsafe upon loss of electrical power will not require redundant power supplies.

IEEE 603 Clauses 2 (References) and 4 (Safety System Design Basis) are not considered to be applicable or necessary due to their nuclear reactor content and redundancy with other IEEE standards and USEC's ISA and ISA Summary.

Note that Annexes A, B, and C provide only "informative" details and references.

IEEE 1050-1996 *Guide for Instrumentation and Control Equipment Grounding in Generating Stations*

IEEE 1050 Clauses 1 (Overview), 3 (Definitions), 4 (Design), 5 (System Grounding), 6 (Shield Grounding), and 7 (Testing) have useful content that may be applicable to the ACP.

The exception that USEC takes to the contents of IEEE 1050 is:

Clause 2 The ACP does not commit to all of the standards listed in this clause.

Note that Annexes A and B provide only "informative" references.

NRC Regulatory Guide-1.75, *Criteria for Independence of Electrical Safety Systems*

USEC has reviewed this Regulatory Guide and concluded the following standard(s) will be used for the ACP. Applicable portions of IEEE 384 and IEEE 603 will be used as guidance for complying with safety system independence criteria.

NRC Regulatory Guide-1.105, *Setpoints for Safety-Related Instrumentation*

USEC has reviewed this Regulatory Guide and concluded the following standard(s) will be used for the ACP instead. The methodology for establishing IROFS setpoints will be in accordance with ANSI/ISA 67.04.01-2000. Setpoints will be established during the final design process.

NRC Regulatory Guide-1.118, *Periodic Testing of Electric Power and Protection Systems*

USEC has reviewed this Regulatory Guide and concluded the following standard(s) will be used for the ACP instead. Applicable portions of IEEE 336, 338 and 603 in conjunction with ACP Maintenance Procedures will be used as guidance for testing electric power and protection systems.

NRC Regulatory Guide-1.180, *Guidelines for Evaluating Electro-Magnetic and Radio Frequency Interference in Safety-Related Instrumentation and Control Systems*

USEC has reviewed this Regulatory Guide and concluded the following standard(s) will be used for the ACP instead. Regulatory Guide-1.180 provides guidance on additional methods for complying with various NRC regulations on design, installation, and testing practices for addressing the effects of EMI/RFI and power surges on safety-related instrumentation and control systems. It endorses IEEE 1050 (with one exception), C62.41 and C62.45; MIL-STD-461E; and the IEC 61000 Series (17 documents) while referencing IEEE 473, 518, 603, and 665, ten NUREG and three other documents. The IEEE C62.41 standard has been superseded by the "trilogy" ANSI/IEEE C62.41.1, C62.41.2, and C62.45.

The design, application, and environment of the ACP IROFS do not merit these additional, rigorous, complex, intensive, and costly EMI/RFI evaluations.

Applicable design and installation practices described in IEEE 1050 in conjunction with standard industrial engineering practices (such as separation, shielding, grounding, filtering and/or use of fiber optic cables) will be utilized to minimize EMI/RFI in the ACP. Applicable portions of IEEE 338 and IEEE 603 will be utilized for testing safety systems.

This standard supplements IEEE 603 by providing guidance for the development of procedures and documentation for testing safety systems in nuclear power stations.