May 30, 2008

Mr. Stephen A. Toelle
Director, Nuclear Regulatory Affairs
United States Enrichment Corporation
2 Democracy Center
6903 Rockledge Drive
Bethesda, MD 20817

SUBJECT: REVISION TO X-326 CELL TREATMENT MONITORING TECHNICAL SAFETY REQUIREMENT AND HIGHLY ENRICHED URANIUM/MEDIUM-ENRICHED URANIUM DEPOSIT REMOVAL PROJECT FOR PORTSMOUTH GASEOUS DIFFUSION PLANT (TAC NO. L32409)

Dear Mr. Toelle:

By letter dated January 7, 2008, the United States Enrichment Corporation (USEC) submitted a certificate amendment request (CAR) regarding the Certificate of Compliance for the Portsmouth Gaseous Diffusion Plant (PORTS). This CAR proposes to revise X-326 Technical Safety Requirements (TSR) Section 2.7.3.5, Cell Treatment Monitoring, and Safety Analysis Report (SAR) Sections 3.1.1.12, 3.1.2.1, 3.1.2.2.2, 3.2, 3.2.3, and 3.7.

The staff completed the review of your CAR and found the proposed revisions to be acceptable. The staff's Certificate Evaluation Report (CER) is contained in Enclosure 1. Enclosure 2 contains Revision 8 to the PORTS Certificate of Compliance reflecting the revisions proposed under this request.

Neither an environmental assessment nor an environmental impact statement is required for the proposed action because the requested amendment to Certificate of Compliance GDP-2 is subject to the categorical exclusion provided in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 51.22(c)(19) and will not have a significant impact on the human environment.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records, component of NRC's Agency-wide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

If there are any questions regarding this action, please contact Ms. Tilda Liu, NRC Project Manager for PORTS at (301) 492-3217 or via e-mail at tilda.liu@nrc.gov.

Sincerely,

Robert C. Pierson, Director
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No.: 70-7002
Certificate No.: GDP-2

Amendment 8

Enclosures:
1. Compliance Evaluation Report
2. Certificate of Compliance GDP-2

cc:
Randall M. DeVault, DOE-Oak Ridge
Douglas Fogel, USEC-Portsmouth

If there are any questions regarding this action, please contact Ms. Tilda Liu, NRC Project Manager for PORTS at (301) 492-3217 or via e-mail at tilda.liu@nrc.gov.

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/RA/

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CERTIFICATE HOLDER: United States Enrichment Corporation
Portsmouth Gaseous Diffusion Plant
Piketon, Ohio

SUBJECT: REVISION TO X-326 CELL TREATMENT MONITORING TECHNICAL SAFETY REQUIREMENT AND HIGHLY ENRICHED URANIUM/MEDIUM-ENRICHED URANIUM DEPOSIT REMOVAL PROJECT FOR PORTSMOUTH GASEOUS DIFFUSION PLANT (TAC NO. L32409)

PROPOSED CHANGES

In its letter dated January 7, 2008, Portsmouth Gaseous Diffusion Plant (PORTS) submitted a certificate amendment request (CAR) to revise X-326 Technical Safety Requirement (TSR) 2.7.3.5, Cell Treatment Monitoring, and Safety Analysis Report (SAR) Sections 3.1.1.12, 3.1.2.1, 3.1.2.2.2, 3.2, 3.2.3, and 3.7. In its amendment request, the United States Enrichment Corporation (USEC or certificate holder) stated that, as part of the cold shutdown activities, the Department of Energy (DOE) has contracted with USEC to remove residual deposits of Highly Enriched Uranium (HEU) and Medium Enriched Uranium (MEU) from the X-326 Cascade Building that is currently held up in installed, but shutdown, cells and equipment. These deposits were left following DOE's initial removal of legacy HEU and MEU holdup material as part of the DOE HEU suspension project. The proposed changes are revisions to PORTS TSR and SAR which contain descriptions to the HEU/MEU deposit removal requirements, processes and activities.

Specifically, TSR 2.7.3.5 requires that an Infrared Analyzer be connected to the cell undergoing treatment. The proposed TSR revision will involve a change to the monitoring requirement for cell treatment gases [not relied on for nuclear criticality safety]. To support DOE's requested deposit removal schedule, USEC will need to have numerous cells under treatment at the same time. Based on the reduced risk associated with the use of the Long Term Low Temperature static chemical treatment process as described in SAR 3.1.1.12, USEC proposed that an Infrared Analyzer only be connected to the cell for the first 24 hours of treatment. Hence, subsequent treatment monitoring would occur daily utilizing the individual cell samples taken to a centrally located Infrared Analyzer for analysis. USEC stated that its deposit removal effort will utilize equipment and processes that have been previously performed under NRC regulation but not as a concerted effort to remove HEU/MEU material from installed cascade equipment.

REGULATORY REQUIREMENTS

In 10 CFR 76.87(d), in part, it states that the TSRs must include an evaluation of the proposed

changes encompassing, at a minimum, the following categories: (1) Safety limits; (2) Limiting control settings; (3) Limiting conditions for operation; (4) Design features; (5) Surveillance requirement; and (6) Administrative controls. Since the certificate holder is requesting a change to the TSRs, the staff has evaluated the proposed amendment to ensure that these requirements are met. As the changes requested by the certificate holder require modifications to approved TSRs, USEC has requested an amendment to its certificate.

DISCUSSION

The certificate holder intends to use the enriched cascade to blend down the enrichment to commercial grade levels and to withdraw this material as LEU product at the X-326 Product Withdrawal area. The certificate holder has conducted cell treatments for deposit removal, as described in the SAR, for many years. The certificate holder stated in its CAR, that through the use of in situ static chemical treatment of the cells, the deposits will be removed with the resultant UF_6 transferred by direct piping to holding drums. UF_6 and treatment gases will then be bled back to the operating cascade, where there will be near instantaneous enrichment blend down to LEU by the inter-stage flow. After the cascade sufficiently separates the oxidant gases from the LEU UF_6, the UF_6 will be withdrawn into 12-inch cylinders that have been cooled in the refrigeration chambers located in the Product Withdrawal area of X-326.

The staff reviewed the CAR and noted that the X-326 cells containing the HEU/MEU and associated building piping were originally designed to be nuclear criticality safe for the processing of HEU/MEU as UF_6 gas, and the conversion of solid deposits to gaseous UF_6 in a fluorinating environment will still maintain the HEU/MEU within the existing NCS analyses for such material and equipment. The nuclear criticality safety (NCS) margin for the withdrawal of 5% enriched material is large and NCS analyses have determined that the cylinders would be subcritical up to an enrichment of 15%.

Additionally, the process of bleeding high-enriched gaseous UF_6 to the cascade is very slow, and the gas will immediately be mixed with a much larger volume of low-enriched UF_6. The inventory of LEU in the enrichment equipment will be approximately 20 times the amount of HEU being bled to the cascade in any week. The worse-case scenario of a loss of LEU feed that went unnoticed for one week would therefore raise any potential withdrawal up to a maximum of 10%. It is not conceivable that the enrichment cascade would continue to be operated for this length of time with total loss of all inter-stage flow. Therefore, there is a very large margin of safety in the cascade equipment.

The staff further notes that the revisions will not result in new types of accidents and that existing NCS analysis will be used. The NCS program as described in Section 5.2 of the SAR and required by TSR 3.11 will not be affected.

Losses of both mass and moderator control are required before criticality involving a deposit is possible. With regard to mass, none of the deposits in the HEU/MEU cells exceed a minimum critical mass (due to deposit removal efforts undertaken during the original HEU cascade shutdown). Conversion of these deposits back to UF_6 will only increase the margin of safety of

existing deposits by converting the removed material to a less dense form and reducing the mass of the deposits.

With regard to moderation, the certificate holder intends to continue to meet the requirements of TSR 2.7.3.4, “Coolant Removal,” TSR 2.7.3.7, “Oxidant Control,” and TSR 2.7.3.14, “Moderation Control.” These controls ensure that the cell coolant systems are drained and evacuated, the cell lube oil systems are drained and isolated, and dresser seals are installed on the compressors to minimize wet air inleakage. These measures will ensure that there is insufficient moderation in the strongly fluorinating cascade environment to allow criticality to occur.

On the basis of its review, the staff concludes that there is reasonable assurance that the proposed revisions will not decrease public health, and safety, security, or the protection of the environment, and therefore, finds the proposed revisions acceptable.

TSR CHANGES

The staff reviewed the proposed changes contained in TSR 2.7.3.5, Cell Treatment Monitoring, under Section 2.7, Specific TSRs for X-326 Cascade Facility, 2.7.3, Limiting Control Settings, Limiting Conditions for Operation, Surveillances. The proposed changes include specific requirements on Actions and Surveillance that shall be performed during Cascade Operational Mode IV, with Limiting Condition for Operation (LCO) that cell treatments shall be monitored with an Infrared Analyzer, with associated Basis supporting the Action and Surveillance requirements.

FINDINGS

The staff reviewed the proposed revisions to TSR 2.7.3.5 and determined that the criteria contained in 10 CFR 76.87(d) have been met. On the basis of its review, the staff concludes that the proposed revisions to TSR 2.7.3.5 do not increase either the probability or consequences of any accident previously analyzed, and no new or different type of accident has been identified, and that there is reasonable assurance that the proposed revisions will not decrease public health and safety, security, or the protection of the environment.

The approval of this amendment request is documented in the Certificate of Compliance GDP-2 by the addition of a reference to the January 7, 2008 letter from USEC describing the TSR revisions.

ENVIRONMENTAL REVIEW

Issuance of the requested amendment to Certificate of Compliance GDP-2 is subject to the categorical exclusion provided in 10 CFR 51.22(c)(19) and will not have a significant impact on the human environment. Therefore, in accordance with 10 CFR 51.22(b), neither an environmental assessment nor an environmental impact statement is required for the proposed amendment request.

CONCLUSIONS

Based on its review and evaluation of the information provided by USEC, in its CAR dated January 7, 2008, the staff finds that the proposed revisions to TSR 2.7.3.5, Cell Treatment Monitoring, which contains specific requirements during Cascade Operational Mode IV, provide adequate protection of public health, safety, and safeguards, and concludes that they are acceptable, consistent with the requirements of 10 CFR Part 76, and should be approved.

PRINCIPAL CONTRIBUTORS

Tamara Powell
Tilda Liu