

September 7, 2006

Mr. Russell B. Starkey, Jr.  
Vice President, Production  
United States Enrichment Corporation  
Two Democracy Center  
6903 Rockledge Drive  
Bethesda, MD 20817

SUBJECT: INSPECTION REPORT NO. 70-7002/2006-202

Dear Mr. Starkey:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine, scheduled, and announced nuclear criticality safety (NCS) inspection from August 7 through 9, 2006, at the Portsmouth facility in Piketon, Ohio. The purpose of this inspection was to determine whether activities authorized by your certificate involving special nuclear material were conducted safely and in accordance with regulatory requirements. Throughout the inspection, observations were discussed with your staff. An exit meeting was held on August 9, 2006, during which time inspection observations and findings were discussed with your staff.

The inspection, which is described in the enclosure, focused on NCS analysis; risk-significant NCS controls and items relied on for safety; and principal management measures for ensuring that NCS controls are capable, available, and reliable. The inspection consisted of reviews of new, changed, and other risk-significant NCS analyses; selective examinations of relevant procedures and records; examinations of safety-related equipment; interviews with plant personnel; and facility walkdowns and observations of in-plant conditions and activities. Throughout this inspection, observations were discussed with your managers and staff. Based on the inspection, your activities involving nuclear criticality hazards were found to be conducted safely and in accordance with regulatory requirements.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and the enclosure will be available in the public electronic reading room of the NRC's Agency-Wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html>.

R. B. Starkey

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If you have any questions concerning this report, please contact Natreon Jordan, of my staff, at (301) 415-7648.

Sincerely,

***/RA/***

Melanie A. Galloway, Chief  
Technical Support Section  
Special Projects Branch  
Division of Fuel Cycle Safety  
and Safeguards, NMSS

Docket No.: 70-7002

Enclosure: Inspection Report No. 70-7002/2006-202

cc: W. Jordan, Portsmouth General Manager  
R. DeVault, Regulatory Oversight Manager, DOE  
G. Workman, Nuclear Regulatory Affairs Manager, Portsmouth  
S. A. Toelle, Manager, Regulatory Affairs, USEC  
C. O'Claire, State Liaison Officer, Ohio

R. B. Starkey

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**U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS**

Docket No.: 70-7002

Certificate No.: GDP-02

Report No.: 70-7002/2006-202

Certificatee: United States Enrichment Corporation

Location: Piketon, Ohio

Inspection Dates: August 7 - 9, 2006

Inspector: Natreon Jordan, Criticality Safety Inspector

Approved by: Melanie A. Galloway, Chief  
Technical Support Section  
Special Projects Branch  
Division of Fuel Cycle Safety  
and Safeguards, NMSS

**Enclosure**

**United States Enrichment Corporation  
Portsmouth Gaseous Diffusion Plant**

**NRC Inspection Report  
70-7002/2006-202**

**EXECUTIVE SUMMARY**

**Introduction**

Staff of the U. S. Nuclear Regulatory Commission (NRC) performed a routine, scheduled, and announced criticality safety inspection of the Portsmouth Gaseous Diffusion Plant facility in Piketon, Ohio, from August 7 through 9, 2006. The inspection included an on-site review of the certificatee programs dealing with the nuclear criticality safety (NCS) program; NCS-related inspections, audits, and investigations; NCS-related training; and plant operations. The certificatee programs were acceptably directed toward the protection of public health and safety and in compliance with NRC regulatory requirements. The inspection focused on risk-significant fissile material processing activities including Buildings X-330, X-344, X-705, and X-710.

**Results**

- The NCS program as observed was adequate for maintaining acceptable levels of safety.
- The certificatee maintains adequate programs to perform inspections, audits, and investigations to assure criticality safety at the facility.
- No safety concerns were identified regarding the qualifications of certificatee NCS staff.
- Plant operations were conducted safely and in accordance with written procedures.

## REPORT DETAILS

### 1.0 Summary of Plant Status

The United States Enrichment Corporation (USEC) operates the Portsmouth Gaseous Diffusion Plant near Piketon, Ohio, in cold standby to maintain U.S. capacity to enrich uranium through diffusion of gaseous uranium hexafluoride (UF<sub>6</sub>). During the inspection, the certificatee was conducting technetium clean-up, deposit remediation in Building X-330, equipment decontamination in Building X-705, and routine waste handling and processing operations.

### 2.0 NCS Program (88015)

#### a. Scope

The inspector reviewed NCS evaluations to determine that criticality safety of risk-significant operations was assured through engineered and administrative controls with adequate safety margin and including preparation and review by qualified staff. The inspector accompanied NCS, and other technical staff, on walkdowns of NCS controls in selected plant areas. The inspector reviewed selected aspects of the following documents:

- NCSA-0705-076.A05, "Nuclear Criticality Safety Approval For Use of Inadvertent Containers in X-705," dated May 17, 2004
- NCSE-0705-076.E05, "Nuclear Criticality Safety Evaluation for Use of Inadvertent Containers in X-705," dated March 31, 2004
- NCSA-PLANT045.A05, "Nuclear Criticality Safety Approval - Limited Safe Volume Containers," dated May 25, 2006
- NCSE-PLANT045.E05, "Nuclear Criticality Safety Evaluation for Limited Safe Volume Containers," dated May 5, 2006
- NCSA-PLANT062.A06, "Nuclear Criticality Safety Approval - Cascade Maintenance, Equipment Removal and Storage," dated May 1, 2006
- XP2-CU-CH2120, "NCS Requirements for Container Handling and Storage," Revision 18, dated February 7, 2006
- XP2-EW-WM2091, "Separation of Dry Active Waste," Revision 3, dated November 28, 2005

#### b. Observations and Findings

Within the selected aspects reviewed, the inspector determined that the analyses were performed by qualified NCS engineers, that independent reviews of evaluations were completed by other qualified NCS engineers, that subcriticality of the systems and operations was assured through appropriate limits on controlled parameters, and that double contingency was assured for each credible accident sequence leading to inadvertent criticality. The inspector determined that NCS controls for equipment and processes assured the safety of the operations.

c. Conclusions

The NCS program, as observed, was adequate for maintaining acceptable levels of safety.

**3.0 NCS Inspections, Audits and Investigations (88015)**

a. Scope

The inspector reviewed the most recent NCS walk-through reports, surveillance reports, and anomalous condition reports related to NCS controls. The inspector reviewed selected aspects of the following documents:

- XP-2006-A001, "Tri-Annual Audit of the Nuclear Criticality Safety Program," dated February 3, 2006
- XP-2006-S055, "Surveillance of UF6 Cylinder Storage," dated August 2, 2006
- XP-2006-S042, "Surveillance of NCS Walk-Through & Review Program," dated July 11-17, 2006
- WTR-CS-2006-001, "NCS Walk-Through Report: X-700 Facility Walk-Down," dated March 28, 2006
- WTR-CS-2006-002, "NCS Walk-Through Report: X-330 Facility Walk-Down," dated March 31, 2006
- WTR-CS-2006-003, "NCS Walk-Through Report: X-333 Facility Walk-Down," dated March 31, 2006

b. Observations and Findings

The inspector determined that certificatee programs to identify, evaluate, and correct NCS deficiencies are being adequately applied to facility processes. The inspector determined that as part of the certificatee's internal auditing program, the problem reporting system was adequately maintained, and the certificatee staff adequately conducted internal inspections and audits, reviewed identified findings, developed corrective actions, and evaluated completion of corrective actions.

c. Conclusions

The certificatee maintains adequate programs to perform inspections, audits, and investigations to assure criticality safety at the facility.

**4.0 NCS Training (88015)**

a. Scope

The inspector reviewed qualifications of NCS engineers performing analysis and independent review to assure that staff responsible for carrying out the NCS function (e.g., the development of safety limits and controls) met minimum qualification standards outlined in the safety analysis report.

b. Observations and Findings

The inspector reviewed the training and qualification profile for a NCS engineer. The engineer's training records indicate that the engineer is very experienced and has participated in a substantial number of workshops and training courses focused on areas of criticality safety. The engineer's qualification records, as reviewed by the inspector, are up to date and appropriately verified and signed off by NCS management. The certificatee maintains an adequate training program to ensure that NCS staff are qualified to maintain the NCS function.

c. Conclusions

No safety concerns were identified regarding the qualifications of certificatee NCS staff.

**5.0 Plant Operations (88015)**

a. Scope

The inspector performed plant walkdowns to review activities in progress and to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspector interviewed operators, NCS engineers, and process engineers both before and during walkdowns.

b. Observations and Findings

The inspector verified the adequacy of management measures for assuring the continued availability, reliability, and capability of safety-significant controls relied upon by the certificatee for controlling criticality risks to acceptable levels. The inspector performed walkdowns of Buildings X-330, X-344, X-705, and X-710. The inspector observed several ongoing operations including technetium cleanup, equipment decontamination, deposit remediation, and waste operations. The inspector reviewed selected NCS analyses and verified that controls identified in those analyses were installed or implemented and were adequate to assure safety. The cognizant NCS engineers were knowledgeable of processes and able to explain the basis for applying applicable controls and for any changes in operations.

c. Conclusions

Plant operations, as observed, were conducted safely and in accordance with written procedures.

**6.0 Open Item Follow-up**

**IFI 70-7002/2006-201-01**

This item tracks the certificatee's actions to assure that non-compliant fissile material storage areas are not inadvertently created. During a previous inspection, the inspector observed that the certificatee was inadvertently creating potential storage locations.

The certificatee committed to develop a method to cause operations staff to recognize when activities were creating a storage area and take appropriate actions to address NCS review. The certificatee also committed to take actions to assure that no other non-compliant fissile material storage areas are inadvertently created. During the current inspection, it was communicated to the inspector that the certificatee walked-down other areas and found storage areas with identical concerns. As part of the corrective actions, the certificatee plans to generate postings for the affected areas. However, the date when full implementation is to be achieved is August 18, 2006. This item remains open.

## **7.0 Exit Meeting**

The inspector communicated the inspection scope and results to members of Portsmouth Gaseous Diffusion Plant management and staff throughout the inspection and during an exit meeting on August 9, 2006. Facility management and staff acknowledged and understood the findings as presented.

## SUPPLEMENTARY INFORMATION

### 1.0 List of Items Opened, Closed, and Discussed

#### Opened

None

#### Closed

None

#### Discussed

**IFI 70-7002/2006-201-01** Tracks the certificatee's actions to assure that non-compliant fissile material storage areas are not inadvertently created.

### 2.0 Inspection Procedures Used

**IP 88015** Headquarters Nuclear Criticality Safety Program

### 3.0 Partial List of Persons Contacted

#### United States Enrichment Corporation

|             |  |
|-------------|--|
| E. Wagner   | Manager, Nuclear Criticality Safety                |
| T. Brooks   | Director, Infrastructure Operations                |
| D. Fogel    | Engineer, Nuclear Regulatory Affairs               |
| G. Workman  | Manager, Nuclear Regulatory Affairs                |
| J. Oyer     | Manager, Nuclear Material Control & Accountability |
| D. D'Aquila | Lead, Nuclear Criticality Safety                   |
| C. Rausch   | Engineer, Nuclear Regulatory Affairs               |

#### NRC

N. Jordan Criticality Safety Inspector, Headquarters

All were in attendance at the exit meeting on August 9, 2006

#### 4.0 Acronym List

|                 |                                       |
|-----------------|---------------------------------------|
| CFR             | Code of Federal Regulations           |
| IFI             | inspector follow-up item              |
| IP              | inspection procedure                  |
| NCS             | nuclear criticality safety            |
| NCSA            | nuclear criticality safety analysis   |
| NCSE            | nuclear criticality safety evaluation |
| NRC             | U.S. Nuclear Regulatory Commission    |
| UF <sub>6</sub> | uranium hexafluoride                  |
| USEC            | U.S. Enrichment Corporation           |