

September 9, 2009

Mr. Robert Van Namen
Senior Vice President – Uranium Enrichment
United States Enrichment Corporation
6903 Rockledge Drive
Bethesda, MD 20817

SUBJECT: INSPECTION REPORT NO. 70-7002/2009-202

Dear Mr. Van Namen:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine, scheduled, and announced nuclear criticality safety (NCS) inspection from August 10-13, 2009, 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 13, 2009, during which time inspection observations and findings were formally discussed with your management and staff.

The inspection, which is described in the enclosure, focused on the most hazardous activities and plant conditions; the most important controls relied on for safety and their analytical basis; and the principal management measures for ensuring controls are available and reliable to perform their functions relied on for safety. The inspection consisted of analytical basis review, selective review of related procedures and records, examinations of relevant nuclear safety NCS-related equipment, interviews with NCS engineers and plant personnel, and facility walkdowns to observe plant conditions and activities related to safety basis assumptions and related NCS controls. Throughout this inspection, observations were discussed with your management and staff.

In accordance to the Title 10 of the *Code of Federal Regulations* 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>.

If you have any questions concerning this report, please contact Thomas Marenchin, of my staff, at (301) 492-3209.

Sincerely,

/RA/

Patricia A. Silva, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure: Inspection Report No. 70-7002/2009-202

Docket No.: 70-7002

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

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OFFICE	NMSS/TSB	NMSS/TSB	NMSS/TSB
NAME	TMarenchin	PJenifer	PSilva
DATE	08/31/09	08/24/09	09/09/09

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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.: 70-7002/2009-202

Certificate Holder: United States Enrichment Corporation

Location: Piketon, Ohio

Inspection Dates: August 10-13, 2009

Inspector: Thomas Marenchin, Criticality Safety Inspector

Approved by: Patricia A. Silva, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure

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

NRC Inspection Report 70-7002/2009-202

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 in Piketon, Ohio, from August 10-13, 2009. The inspection included an on-site review of certificate holder programs dealing with plant operations, the nuclear criticality safety (NCS) program, audits and inspections, and NCS-related corrective actions. The inspection focused on risk-significant fissile material processing activities including those in Buildings X-326, X-344, and X-705.

Results

- The NCS program observed was adequate for maintaining acceptable levels of safety.
- Certificate holder NCS walkthroughs, assessments, and surveillance were adequate for maintaining acceptable levels of safety.
- No safety concerns were identified regarding the certificate holder's internal event reporting, investigation, and corrective actions.
- No safety concerns were identified during walkdowns of the facility and operations.
- No concerns were identified regarding certificate holder's criticality accident alarm system (CAAS) coverage of fissile material operations.
- No safety concerns were identified regarding the certificate holder's NCS evaluations.

REPORT DETAILS

1.0 Summary of Plant Status

The United States Enrichment Corporation (USEC) operates the Portsmouth Gaseous Diffusion Plant (GDP) near Piketon, OH, in cold shutdown. During the inspection, the certificate holder was conducting cell deposit remediation, maintenance and equipment salvage, equipment decontamination, uranium recovery, waste water treatment, and routine dry waste handling and processing operations.

2.0 Nuclear Criticality Safety Program (IP 88015)

a. Inspection Scope

The inspector reviewed the certificate holder's NCS program. The inspector evaluated the adequacy of the program to assure the safety of fissile material operations. The inspector interviewed certificate holder managers, NCS engineers, system engineers, and facility operators during document review and facility walkdowns. The inspector reviewed NCS administrative procedures and selected NCS controls to determine whether the procedures adequately implemented the NCS program described in the certificate. The inspector reviewed selected aspects of the following document:

- XP4-CO-CN2122, "Long-Term Low Temperature (LTLT) Treatment of X-326 Cells," Revision 3, dated July 23, 2009

b. Observations and Findings

The inspector observed that the certificate holder had an NCS program which was independent from production and was implemented through written procedures. The inspector determined that the certificatee's NCS program was conducted in accordance with written administrative procedures that reflected the program described in the certificate.

c. Conclusions

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

3.0 Nuclear Criticality Safety Inspections, Audits and Investigations (IP 88015)

a. Inspection Scope

The inspector reviewed records of previously-completed certificate holder internal NCS walkthroughs of fissile operations. The inspector reviewed selected aspects of the following documents:

- PR-PTS-07-02083, "X-705 Walk Through Findings," dated July 13, 2007
- PR-PTS-09-01507, "X-705 Storage Arrays," dated July 7, 2009
- PR-PTS-09-01586, "X-705 Postings," dated July 14, 2009
- PR-PTS-09-01828, "X-344 Tc Trap Storage area without NCS Postings," dated August 13, 2009

- WTR-CS-2009-003, dated March 16, 2009
- WTR-CS-2009-004, dated March 31, 2009
- WTR-CS-2009-005, dated April 1, 2009
- WTR-CS-2009-006, dated June 22, 2009
- WTR-CS-2009-007, dated July 13, 2009
- XP-2009-S009, "X-705 Dissolving Uranium Solids in a Handtable," dated March 17, 2009
- XP-2009-S017, "X-705 Oxide Handling," Dated April 17, 2009
- XP-2009-S020, "LTLT Treatment of X-330 Cells," dated May 27, 2009
- XP-2009-S032, "X-326 NCS," dated July 29, 2009
- XP-2009-S032, "Polybottle Handling and Processing," dated July 31, 2009

b. Observations and Findings

The inspector determined that certificate holder NCS engineers observed plant operations to determine adequacy of implementation of NCS requirements and ensured that implementation weaknesses were identified and entered into the corrective action system. The inspector observed that the certificate holder NCS walkthroughs and assessments were conducted within the required time limit and were performed in accordance with written procedures. The inspector noted that the walkthroughs and assessments were performed by NCS engineers who: (1) reviewed NCS issues from previous audits; (2) reviewed the adequacy of control implementation; (3) reviewed plant operations for compliance with certificate holder requirements, procedures, and postings; and (4) examined equipment and operations to determine that past evaluations remained adequate.

c. Conclusions

The certificate holder NCS walkthroughs, assessments, and surveillance were adequate for maintaining acceptable levels of safety.

4.0 Nuclear Criticality Safety Event Review and Follow-up (IP 88015)

a. Inspection Scope

The inspector reviewed recent internally- and externally-reported NCS-related events. The inspector reviewed selected aspects of the following documents:

- Anomalous Conditions Incident Report, 09-00846, "Assay is Greater than the Posted NCSA Limit," Revision 0, dated April 20, 2009
- Anomalous Conditions Incident Report, 09-00916, "Pigtails with Visible Contamination Found Inside of a Scrap Drum," Revision 0, dated April 29, 2009
- Anomalous Conditions Incident Report, 09-01208, "X-705 Surveillance," Revision 0, dated June 2, 2009
- Anomalous Conditions Incident Report, 09-01325, "A Plastic Flange cap with thin film of Uranium Material Found in X-333," Revision 0, dated June 16, 2009
- Anomalous Conditions Incident Report, 09-01570, "X-705 Storage Arrays," Revision 0, dated July 13, 2009

b. Observations and Findings

The inspector determined that events were investigated in accordance with written procedures and appropriate corrective actions were assigned.

c. Conclusions

No safety concerns were identified regarding the certificate holder's internal event reporting, investigation, and corrective actions.

5.0 Plant Activities (88015)

a. Inspection 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 verified the adequacy of management measures for assuring the continued availability, reliability, and capability of safety-significant controls relied upon by the certificate holder for controlling criticality risks to acceptable levels. The inspector performed walkdowns of Buildings X-326, C-344, and X-705. The inspector reviewed selected aspects of the following documents prior to performing the walkdowns:

- NCSA-0705-012, "Operation of the X-705 Small Parts hand-Tables in A-Area," Revision 7, dated June 14, 2005
- NCSA-0705-024, "X-705 B-Area Electric Calciners," Revision 7, dated May 6, 2009
- NCSE-0705-012, "Operation of the X-705 Small Parts hand-Tables in A-Area," Revision 6, dated June 14, 2005
- NCSE-0705-024, "X-705 B-Area Electric Calciners," Revision 7, dated May 6, 2009

b. Observations and Findings

The inspector verified that controls identified in the NCS analyses reviewed were adequate to assure safety. The cognizant NCS engineers were knowledgeable and able to explain the basis for changes in operations and controls.

c. Conclusions

No safety concerns were identified during walkdowns of the facility and operations.

6.0 Criticality Alarm System (IP 88017)

a. Inspection Scope

The inspector reviewed documentation of criticality accident alarm detector coverage, interviewed engineering and maintenance staff, and performed facility walkdowns to determine the adequacy of the certificate holder criticality alarm system.

b. Observations and Findings

The inspector determined that the certificate holder had installed and maintained a system of criticality detectors that were capable of monitoring fissile material operations at the facility and reliably detecting the minimum accident of concern.

c. Conclusions

No concerns were identified regarding certificate holder's CAAS coverage of fissile material operations.

7.0 Nuclear Criticality Safety Evaluations and Analyses (IP 88016)

a. Inspection Scope

The inspector reviewed NCS analyses to determine that criticality safety of risk-significant operations was ensured through engineered and administrative controls with adequate safety margin 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-0705-012, "Operation of the X-705 Small Parts hand-Tables in A-Area," Revision 7, dated June 14, 2005
- NCSA-0705-021, "B-Area Batching Hand Table Operations," Revision 5, dated June 5, 2009
- NCSA-0705-024, "X-705 B-Area Electric Calciners," Revision 7, dated May 6, 2009
- NCSA-0705-134, "Operation of the X-705 Recovery System Pre- and Post Evaporators and Condensers," Revision 2, dated June 22, 2009
- NCSA-PLANT085, "X-340 Complex Autoclave Operations," Revision 10, dated August 18, 2008
- NCSA-PLANT097, "Tc Trap Handling and Maintenance," Revision 3, dated August 9, 2009
- NCSE-0705-012, "Operation of the X-705 Small Parts hand-Tables in A-Area," Revision 6, dated June 14, 2005
- NCSA-0705-021, "B-Area Batching Hand Table Operations," Revision 5, dated June 5, 2009
- NCSE-0705-024, "X-705 B-Area Electric Calciners," Revision 7, dated May 6, 2009
- NCSE-0705-134, "Operation of the X-705 Recovery System Pre- and Post Evaporators and Condensers," Revision 2, dated June 22, 2009
- NCSA-PLANT085, "X-340 Complex Autoclave Operations," Revision 10, dated August 15, 2008
- NCSE-PLANT097, "Tc Trap Handling and Maintenance," Revision 3, dated August 9, 2009

b. Observations and Findings

The inspector reviewed NCS approvals, NCS evaluations, and supporting calculations for new, changed, and other selected operations. Within the selected aspects reviewed,

the inspector determined that the analyses were performed by qualified NCS engineers, that independent reviews of the evaluations were completed by 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. Nuclear criticality safety analyses and supporting calculations demonstrated adequate identification and control of NCS hazards to assure operations within subcritical limits.

c. Conclusions

No safety concerns were identified regarding the certificate holder's NCS evaluations.

8.0 Exit Meeting

The inspector communicated the inspection scope and results to members of Portsmouth GDP management and staff throughout the inspection and during an exit meeting on August 13, 2009. Portsmouth GDP management and staff acknowledged and understood the findings as presented.

SUPPLEMENTARY INFORMATION

1.0 Items Opened, Closed, and Discussed

Items Opened

None

Items Closed

None

2.0 Inspection Procedures Used

IP 88015	Nuclear Criticality Safety Program
IP 88016	Nuclear Criticality Safety Evaluations and Analyses
IP 88017	Criticality Alarm Systems

3.0 Partial List of Persons Contacted

USEC

T. Brooks	Director, Infrastructure Operations
D. D'Aquila	Engineer, Nuclear Criticality Safety
D. Fogel	Manager, Nuclear Regulatory Affairs
K. James	Engineer, Nuclear Criticality Safety
S. May	Manager, Shift Operations
J. Rapp	Engineer, Nuclear Criticality Safety
L. Sendek	Engineer, Nuclear Regulatory Affairs
J. Tully	Manager, X-326 Operations
E. Wagner	Manager, Nuclear Criticality Safety
L. Wilber,	Manager, X-330/X-333 Operations

NRC

T. Marenchin	Criticality Safety Inspector, Headquarters
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All attended the exit meeting on August 13, 2009.

4.0 List of Acronyms and Abbreviations

ADAMS	Agency-Wide Document Access and Management System
CAAS	criticality accident alarm system
DOE	U.S. Department of Energy
IP	inspection procedure
NCS	nuclear criticality safety
NCSA	nuclear criticality safety approval
NCSE	nuclear criticality safety evaluation
USEC	U. S. Enrichment Corporation (certificate holder)