



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

November 14, 2005

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

SUBJECT: NRC INSPECTION REPORT NO. 070-07001/2005-007

Dear Mr. Starkey:

On October 22, 2005, the NRC completed a routine resident inspection at the Paducah Gaseous Diffusion Plant. The purpose of the inspection was to determine whether activities authorized by the certificate were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection on October 21, 2005, the NRC inspectors discussed the findings with members of your staff.

This inspection consisted of an examination of activities conducted under your certificate as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your certificate. Areas examined during the routine inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region II and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001 and the NRC Resident Inspector at the Paducah Gaseous Diffusion Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

R. B. Starkey, Jr.

2

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

Jay L. Henson, Chief
Fuel Facility Inspection Branch 2
Division of Fuel Facility Inspection

Docket No. 070-07001
Certificate No. GDP-1

Enclosure:
Inspection Report No. 070-07001/2005-007

cc w/encl:

S. Penrod, Paducah General Manager
S. R. Cowne, Paducah Regulatory Affairs Manager
P. D. Musser, Portsmouth General Manager
S. A. Toelle, Director, Nuclear Regulatory Affairs, USEC
Paducah Resident Inspector Office
R. M. DeVault, Regulatory Oversight Manager, DOE
G. A. Bazzell, Paducah Facility Representative, DOE
M. W. McKinley, Acting Manager, Radiation Health and Toxic Agents Branch, Commonwealth of Kentucky

Distribution w/encl:

D. Martin, NMSS
R. Nelson, NMSS
D. Ayres, RII
J. Henson, RII
D. Hartland, RII
PUBLIC

*see previous concurrence

☐ PUBLICLY AVAILABLE

☐ NON-PUBLICLY AVAILABLE

☐ SENSITIVE

☐ NON-SENSITIVE

ADAMS: ☐ Yes ACCESSION NUMBER: _____

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI				
SIGNATURE	DH 11/14	DH 11/14	DH 11/14				
NAME	BBartlett*	MLThomas*	DHartland*				
DATE	11/ /2005	11/ /2005	11/ /2005	11/ /2005	11/ /2005	11/ /2005	11/ /2005
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME: E:\Filenet\ML053180363.wpd

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 070-07001

Certificate No.: GDP-1

Report No.: 070-07001/2005-007

Facility Operator: United States Enrichment Corporation

Facility Name: Paducah Gaseous Diffusion Plant

Location: Paducah, KY

Dates: August 28, through October 22, 2005

Inspectors: Bruce L. Bartlett, Senior Resident Inspector
Mary L. Thomas, Resident Inspector

Approved by: Jay Henson, Chief
Fuel Facility Inspection Branch 2
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

United States Enrichment Corporation
Paducah Gaseous Diffusion Plant
NRC Inspection Report No. 070-07001/2005-007

This inspection included aspects of certificatee safety operations and facility support. The report covered resident inspection activities, including follow-up to issues identified during previous inspections.

Plant Operations

- Problems with operations and maintenance personnel performance and attention to detail were identified during the inspection period. The issues were not risk significant but were indicative of poor performance. Certificatee management intended to implement long-term corrective actions to prevent recurrence. One unresolved item related to the review of the certificatee's investigation of a Technical Safety Requirement violation was identified. (Paragraph 2.a)

Maintenance and Surveillance

- The inspectors identified a non-cited violation regarding the installation of a temporary configuration without a procedure or instructions in a work order. The certificatee took appropriate corrective action to prevent recurrence. (Paragraph 3.a)

Attachment:

Partial List of Persons Contacted

Inspection Procedures Used

List of Items Opened, Closed, and Discussed

List of Acronyms

REPORT DETAILS

1. Summary of Plant Status

The certificatee performed routine operations throughout the inspection period. Plant load was increased to 1425 megawatts and product assay was increased to 2.4 percent in accordance with the production schedule.

2. Plant Operations

a. Conduct of Operations - Routine Operations Activities

(1) Scope and Observations (88100)

The inspectors observed routine operational activities and discussed routine operations with staff and management. In addition, the inspectors reviewed the applicable area control room (ACR) log books and routine surveillance forms. The inspectors observed operators respond to various alarms.

The inspectors observed routine operations in the cascade buildings and area control rooms, the feed vaporization facilities, product and tails withdrawal facilities, and the central control facility. The operations staff were alert and generally knowledgeable of the current status of equipment associated with their assigned facilities.

However, during the inspection period, problems with operator performance and attention to detail were observed. The issues were not risk significant but were indicative of overall poor performance. Examples included:

- On September 1, operators were transferring power for six operating cells from a transformer when they inadvertently shifted power to a transformer that was not energized. The cells tripped on loss of power which resulted in a minor plant transient. Five of the six cells were restarted over the next several days, while the last cell required some minor maintenance prior to being restarted.
- On September 3, an operator had just finished unhooking a crane from a cylinder in the C-360 building when the hook was inadvertently snagged on an autoclave shell. Before the operator recognized the problem, the autoclave was lifted and moved off of its railing system. The damage to the autoclave was minimal but some testing was required to verify operability of the autoclave was not impacted.
- On September 24, during a routine control room observation, the inspectors determined that the operators were not aware that 8,000 pounds of uranium hexafluoride (UF_6) had been inadvertently sublimed from a freezer/sublimator to the cascade. Work had been performed on the weight bridges for the C-333, Unit 4, Cell 3 Freezer/Sublimator (F/S) the previous day. During that work activity, high-high weight trip alarms were actuated by the instrument mechanics. The instrument mechanics later stopped work for the day but did not inform the operators.

Later that day when a spurious high-high weight trip alarm was received, the operators assumed it was caused by the instrument mechanics and simply acknowledged the alarm. The high-high weight trip resulted in the opening of the F/S vent valve, allowing material to begin subliming back to the cascade. The sublimation continued for over 31 hours, even after the cascade coordinator had noted the increase in load and asked the ACR operator about it just prior to the inspectors identifying the cause. The inspectors noted that the operators and instrument mechanics demonstrated poor communications, and the operators demonstrated poor attention to detail when responding to the high-high weight trip alarm.

- On October 4, a Technical Safety Requirement (TSR) violation occurred in the C-360 building. After a 30B cylinder had been filled and the cylinder valve was closed, a leak check performed prior to disconnecting the pigtail disclosed that the valve was not fully closed. Due to the failed leak test, TSR 2.1.4.14 Action A.1 required that the cylinder be allowed to cool prior to disconnecting the pigtail. Instead, certificatee personnel determined that the leak rate was small enough that a vacuum source (gulper) could be used to contain the small release that was expected. The operators then disconnected the pigtail. The release that resulted was small and was contained by the gulper.

The failure to follow the TSR was discovered by plant personnel during shift turnover activities the next morning. The preliminary assessment determined that the operators failed to follow procedure, and their front line manager (FLM) and the Assistant Plant Shift Superintendent also failed to refer to the procedure and the TSR before authorizing the disconnection of the pigtail. Prompt corrective actions were implemented including briefing the operating crews to remind them of the need to follow procedures, as well as the need to thoroughly review procedures and the TSRs when unexpected situations were identified.

At the close of the inspection period, the certificatee was still completing their root cause analysis and establishing their long-term corrective actions. The inspectors' review of the certificatee's completed investigation is an unresolved item (URI) (URI 070-07001/2005-007-001).

- On October 14, while attempting to disconnect a compressor from the diesel generator air start system (non-safety related) in one of the cascade buildings, a mechanic unexpectedly encountered compressed air and determined that the system needed additional isolation. The mechanic closed one valve and then removed the compressor from the system.

Upon further review, certificatee staff determined that the lock-out/tag-out (LOTO) that was prepared did not adequately isolate the compressor, and the independent reviewer and the two operators who implemented the LOTO did not identify the inadequacy. In addition, the functional test to confirm that the generator was adequately isolated was not performed, and the FLM who authorized the work to be performed and the maintenance personnel did not identify that the verification for the test was not completed.

For each of the above performance issues, the inspectors verified that prompt corrective action was implemented. Discussions with certificatee senior management determined that they were focused on long-term corrective actions to prevent recurrence including increased management oversight, the increased use of the infrequently performed test or evolution procedure when applicable, and improving the quality of procedures.

(2) Conclusions

Problems with operations and maintenance personnel performance and attention to detail were identified during the inspection period. The issues were not risk significant but were indicative of poor performance. Certificatee management intended to implement long-term corrective actions to prevent recurrence. One URI related to the review of the certificatee's investigation of a TSR violation was identified.

b. Miscellaneous Open Item Closures (92701)

(Closed) URI 2005-001-02: Review of certificatee's assessment regarding which safety-related and non-safety related molded case circuit breakers needed to be in a testing and/or periodic cycling program. Certificatee personnel identified several safety-related breakers that needed to be added to a testing program including the emergency stop circuit on the liquid UF₆ handling cranes. In addition, non-safety related breakers were added to a periodic cycling program that included an upgrade of their lubrication. This unresolved item is closed.

(Closed) URI 2005-001-03: Review of certificatee's assessment of the mechanical interference issues with GE AL-2-75 breakers. The root cause of the mechanical interference was properly identified and appropriate corrective measures were established and proceduralized. This unresolved item is closed.

(Closed) CER 41882: C-310 Cylinder Valve Closure System nitrogen bottle was reading zero psig. The inspectors have reviewed the completed and proposed corrective actions taken in response to this event. The completed corrective actions included the replacement of components that were leaking and the issuance of a long term order to take hourly readings of the nitrogen bottle pressure gauge. In addition, the certificatee intended to modify the system to add an alarm that more accurately monitored nitrogen bottle pressure. The proposed completion date is June 2006. The long-term order will remain in effect until the proposed corrective action is completed. The inspectors have no further issues, and this item is closed.

3. Maintenance and Surveillance

a. Maintenance and Surveillance Activity Reviews

(1) Scope and Observations (88102 and 88103)

For the maintenance and surveillance activities listed below, the inspectors verified one or more of the following: activities observed were performed in a safe manner; testing was performed in accordance with procedures; measuring and test equipment was within calibration; TSR Limiting Conditions for Operations were entered, when appropriate; removal and restoration of the affected components were properly

accomplished; test acceptance criteria were clear and conformed with the TSR and the Safety Analysis Report; and any deficiencies or out-of-tolerance values identified during the testing were documented, reviewed, and resolved by appropriate management personnel.

- Work Order (WO) 0513636-01, Repair of gouges on C-360 Autoclave Number 1 shell
- WO 0513636-02, Testing of C-360 Autoclave Number 1 after repairs to shell
- WO 0513658-01, Repair and Testing of C-360 East Crane
- WO 0507184, Final tie of feeder cable between A-1 substation and A-3 substation and perform testing
- WO 0514010-01, Remove/cap lines and replace photohelics, pressure regulator, filters, and check valve on C-337 Unit 5B buffer panel
- WO 0510159-01, Calibrate "A" suction differential pressure transmitter in accordance with Procedure CP4-GP-IM6422, "C-310 A-line Suction Pressure Indication Calibration"
- WO 0509116-01, Replace C-333 R-114 Valve 3X, leaks around stem
- WO 0504672-01, Install access hatches on the north and south freon tanks
- WO 0514609-01, Perform non-tare calibration and troubleshoot/repair Unit 4 Cell 3 Freezer/Sublimator

During review of implementation of Procedure CP2-GP-GP4110, "Administrative Control of Jumpers, Leads, and Temporary Configurations," the inspectors identified an issue with the requirements regarding control of temporary configurations initiated by operations. Section 8.2 of Procedure CP2-GP-GP4110 provided instructions with respect to initiating a work request for the installation and removal of a temporary configuration that was not already covered by a separate procedure or WO.

The inspectors noted that the certificatee had connected a temporary air line to evacuate a buffer panel in C-333 Unit 2 through a sample buggy to a connection between the seats of Valve 3AB1. The inspectors determined that connections to sample buggies were covered by a procedure. However, connecting a component requiring evacuation through a sample buggy to an evacuation source was not covered, and the certificatee did not initiate a work request to install the temporary air connection as required by Procedure CP2-GP-GP4110.

In response, the certificatee entered Assessment and Tracking Report (ATR) -05-3354 into their corrective action program and initiated Work Request 5079135 to perform the temporary connection. Corrective actions included crew briefings and discussions to remind personnel of the requirements for initiating work requests as required by Procedure CP2-GP-GP4110.

The safety significance of this issue was minimal as the temporary connection was not a complex evolution and the instrument mechanics were knowledgeable of the buffer panel, sample buggy, and valve instrument line connections. Therefore, this non-repetitive NRC-identified and certificatee corrected violation is being treated as a non-cited violation (NCV) consistent with Section VI.A.8 of the NRC Enforcement Policy. (NCV 070-07001/2005-007-02)

(2) Conclusions

The inspectors identified a NCV regarding the installation of a temporary configuration without a procedure or instructions in a WO. The certificatee took appropriate corrective action to prevent recurrence.

4. Exit Meeting Summary

The inspection scope and results were summarized on October 21, 2005, with General Manager Steve Penrod and members of the facility management. The inspectors asked the certificatee staff whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT

1. **PARTIAL LIST OF PERSONS CONTACTED**

Certificatee

S. Penrod, General Manager
M. Keef, Plant Manager
S. Cowne, Nuclear Regulatory Affairs Manager
K. Ahern, Production Support Manager
M. Boren, Nuclear Regulatory Affairs
M. Buckner, Customer Services and Product Scheduling
C. Hicks, Scheduling Manager
P. Jenny, Security Manager
J. Labarraque, Nuclear Safety and Quality Manager
J. Lewis, Maintenance Manager
S. McKinney, System Engineer Manager
M. Mack, Operations
D. Page, Plant Shift Superintendent Manager
D. Snow, Health and Safety Manager
J. Vogelsang, Procurement and Materials

Other certificatee employees contacted included engineers, technicians, and office personnel.

2. **INSPECTION PROCEDURES USED**

IP 88100	Operations
IP 88101	Configuration Control
IP 88102	Surveillance Observations
IP 88103	Maintenance Observations
IP 92700	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92701	Follow-up

3. **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Description</u>
2005-007-01	Open	URI	Certificatee root cause assessment and corrective actions for C-360 TSR violation.
2005-007-02	Closed	NCV	NRC-identified failure to follow procedure while connecting a sample buggy.

2005-001-02	Closed	URI	Certificatee to assess the 480 volt breaker mechanical interface problems and corrective actions.
2005-001-03	Closed	URI	Certificatee to assess the need for safety related molded case circuit breakers (MCCBs) to be in a testing program.
41882	Closed	CER	C-310 Cylinder Valve Closure System nitrogen bottle was reading zero psig.

4. **LIST OF ACRONYMS USED**

ACR	Area Control Room
ADAMS	Agencywide Documents Access and Management System
ATR	Assessment and Tracking Report
MCCB	Molded Case circuit Breaker
CFR	Code of Federal Regulations
F/S	Freezer/Sublimers
FLM	Front Line Manager
GDP	Gaseous Diffusion Plant
LOTO	Lock Out/Tag Out
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PDR	Public Document Room
PGDP	Paducah Gaseous Diffusion Plant
TSR	Technical Safety Requirement
UF ₆	Uranium Hexafluoride
URI	Unresolved Item
USEC	United States Enrichment Corporation
WO	Work Order