

August 10, 2001

Mr. J. M. Brown
Vice President - Operations
United States Enrichment Corporation
Two Democracy Center
6903 Rockledge Drive
Bethesda, MD 20817

SUBJECT: PORTSMOUTH INSPECTION REPORT 07007002/2001-006(DNMS)
AND NOTICE OF VIOLATION

Dear Mr. Brown:

On July 30, 2001, the NRC completed a routine resident inspection at the Portsmouth 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, the inspectors discussed the findings with members of your staff.

Areas examined during the 6-week inspection period are identified in the report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of the inspection, the NRC has determined that one violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding the violation are described in detail in the enclosed report. The violation is of concern because your staff's lack of rigor in adhering to plant procedures resulted in their failure to address deficiencies during safety system surveillance testing.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned, and the date when full compliance will be achieved is already adequately addressed in the enclosed inspection report. Therefore, you are not required to respond to the violation unless the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed notice.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures 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/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

J. Brown

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

Sincerely,
/RA by M. Phillips acting for/
Patrick L. Hiland, Chief
Fuel Cycle Branch

Docket No. 07007002
Certificate No. GDP-2

- Enclosures:
1. Notice of Violation
 2. Inspection Report 07007002/2001-006(DNMS)

- cc w/encls:
- P. D. Musser, Portsmouth General Manager
 - P. J. Miner, Manager, Nuclear Regulatory Affairs, Portsmouth
 - H. Pulley, Paducah General Manager
 - S. A. Toelle, Director, Nuclear Regulatory Affairs, USEC
 - Portsmouth Resident Inspector Office
 - Paducah Resident Inspector Office
 - R. M. DeVault, Regulatory Oversight Manager, DOE
 - S. J. Robinson, Portsmouth Site Manager, DOE
 - J. R. Williams, State Liaison Officer

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NOTICE OF VIOLATION

United States Enrichment Corporation
Portsmouth Gaseous Diffusion Plant

Docket No. 07007002
Certificate No. GDP-2

During an NRC inspection conducted from June 19, 2001, through July 30, 2001, one violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, Revision 1, the violation is listed below:

Technical Safety Requirement (TSR) 3.9.1 requires, in part, that written procedures shall be prepared, reviewed, approved, and implemented for activities described in Appendix A of Safety Analysis Report (SAR) Section 6.11.

Appendix A of SAR Section 6.11 describes TSR surveillances as activities for which procedures shall be implemented.

Step 8.1.6 of Procedure XP2-CO-CA2031, "Surveillance Of Pyrotronics Smoke Detection System For Extended Range Product (ERP) Station In X-326 Building," which implements TSR Surveillance Requirement 2.5.3.3.2, requires, in part, that when pigtail valve FV-110 and FV-110X stems indicated that the valves were closed, stop the calibrated timepiece used to measure valve closure. In addition, Step 8.1.9 of Procedure XP2-CO-CA2031 requires, in part, that if the smoke detector did not actuate when exposed to simulated smoke, contact the Operations and Maintenance First Line Managers (FLMs) to determine corrective actions.

Contrary to the above, on July 2, 2001, the inspectors observed that operators stopped the timepiece before pigtail valve FV-110 stem indicated that the valve was closed. In addition, when a smoke detector did not actuate when exposed to simulated smoke, plant staff did not contact the Operations and Maintenance FLMs to determine corrective actions before continuing with procedural steps.

This is a Severity Level IV violation (Supplement VI). **(VIO 07007002/2001-006-01)**

The NRC has concluded that information regarding the reasons for Violation 07007002/2001-006-01, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance will be achieved are already adequately addressed in the enclosed Inspection Report. Therefore, a specific response to Violation 07007002/2001-006-01 is not required. However, you are required to submit a written statement or explanation, pursuant to 10 CFR 76.70, if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at Portsmouth, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be placed in the NRC Public Electronic Reading Room (PERR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PERR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the basis for your claim of withholding (for example, explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 10th day of August 2001

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 07007002
Certificate No: GDP-2

Report No: 07007002/2001-006(DNMS)

Facility Operator: United States Enrichment Corporation

Facility Name: Portsmouth Gaseous Diffusion Plant

Location: 3930 U.S. Route 23 South
P.O. Box 628
Piketon, OH 45661

Dates: June 19, 2001, through July 30, 2001

Inspectors: David J. Hartland, Senior Resident Inspector
Stephen R. Caudill, Resident Inspector

Approved By: Patrick L. Hiland, Chief
Fuel Cycle Branch
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

United States Enrichment Corporation Portsmouth Gaseous Diffusion Plant NRC Inspection Report 07007002/2001-006(DNMS)

Operations

The inspectors identified a lack of rigor in implementing Nuclear Criticality Safety Approval (NCSA) requirements for storage of contaminated metal in Building X-344, as compliance was not ensured until an issue was raised by the inspectors. Building management intended to characterize, batch, and dispose of contaminated scrap metal in a more timely manner to avoid future potential NCSA compliance issues. (Section O1.1)

Maintenance

The inspectors identified procedural violations during Extended Range Product Station pyrotronics testing in that plant staff did not time closure of cylinder safety valves or contact management when a smokehead failed to actuate when exposed to simulated smoke. The inspectors also identified that plant staff pre-conditioned the smokeheads by cleaning them prior to testing. Plant management took appropriate corrective action to address the deficiencies. (Section M1.1)

Engineering

The inspectors concluded that the annual inspection of the cascade fire water system sprinkler heads was sufficient to ensure system operability, based on the relatively small number of heads found to be corroded to date and even fewer that would not have actuated at available system pressure. (Section E1.1)

Report Details

I. Operations

O1 Conduct of Operations

O1.1 Nuclear Criticality Safety Approval Compliance Issue

a. Inspection Scope (88100)

The inspectors observed plant operations to assess compliance with certificate requirements.

b. Observations and Findings

On July 12, while touring the upstairs area in Building X-344, the inspectors observed that some contaminated components appeared to be spaced less than 24 inches apart edge-to-edge, a possible violation of Nuclear Criticality Safety Approval (NCSA) Plant 048, "Contaminated Metal." The inspectors discussed the observation with building management, who bounded off the area and initiated an anomalous condition response as required by plant procedure.

Nuclear Criticality Safety (NCS) staff responded and determined that double contingency was maintained. That determination was based on an evaluation documented in the NCSA that allowed the batching of components containing uranium enriched to less than ten percent with a total hidden volume of up to three liters. However, the inspectors concluded that plant staff displayed a lack of rigor in implementing the NCSA requirements, as compliance with the as-found condition was not ensured until the issue was raised by the inspectors. As corrective action, building management intended to characterize, batch, and dispose of contaminated scrap metal in a more timely manner to avoid future potential NCSA compliance issues.

c. Conclusions

The inspectors identified a lack of rigor in implementing NCSA requirements for storage of contaminated metal in Building X-344, as compliance was not ensured until an issue was raised by the inspectors. Building management intended to characterize, batch, and dispose of contaminated scrap metal in a more timely manner to avoid future potential NCSA compliance issues.

O8 Miscellaneous Operations Issues

O8.1 Certificatee Event Reports (90712)

The certificatee made the following operations-related event report during the inspection period. The inspectors reviewed any immediate safety concerns indicated at the time of the initial verbal notification. The inspectors will evaluate the associated written report for the event following submittal, as applicable.

<u>Number</u>	<u>Date</u>	<u>Status</u>	<u>Title</u>
38149	7/17/01	*Retracted	Safety System Failure; during an inspection of the High Pressure Fire Water Sprinkler System in Building X-333, five adjacent sprinkler heads were discovered with visible corrosion deposits.

* Discussed in Section E1.1

O8.2 Bulletin 91-01 Reports (97012)

The certificatee made the following reports pursuant to Bulletin 91-01 during the inspection period. The inspectors reviewed any immediate NCS concerns associated with the reports at the time of the initial verbal notification. Based on the inspectors review of the events, the events are considered closed unless otherwise noted.

<u>Number</u>	<u>Date</u>	<u>Title</u>
38128	7/10/01	24-Hour Report - NCS violation; two filter press plates that were loosely wrapped with plastic were discovered in an area of Building X-705 that was controlled for inadvertent containers.
38168	7/24/01	24-Hour Report - NCS violation; Cell 29-4-6 in Building X-330 was discovered with a pressure below the 14 psia required for shutdown cascade equipment at a uranium hexafluoride (UF ₆) negative.

O8.3 (Closed) IFI 70-7002/99203-02: Plant management actions to review the conduct of operations in the cascade and other facilities to assure that operations were being conducted in accordance with plant procedures. The inspectors have continued to identify problems with procedure adherence, including failure to properly complete in-hand checklists and log sheets. The inspectors will use VIO 70-7002/2001004-01 to track the effectiveness of the more recent actions to correct the generic problem. This item is closed.

II. Maintenance

M1 Conduct of Maintenance Activities

M1.1 Extended Range Product Station Pyrotronics Testing

a. Inspection Scope (88102 and 88103)

The inspectors observed selected safety system surveillance and maintenance activities to assess if activities were performed safely and in accordance with certificate requirements.

b. Observations and Findings

On July 2, while observing pyrotronics testing at the Building 326 Extended Range Product (ERP) Station, the inspectors observed the following deficiencies:

Plant staff “pre-conditioned” the smokeheads by cleaning them prior to testing with the calibrated smoke gun. As a result, there was no assurance that the smokeheads would have been available to perform their required safety function since the last surveillance. The inspectors learned that, recently, the generic work package had been revised to remove the requirement to perform the as-found testing. Technical reviews of the work package as well as pre-job briefing by the Operations First Line Manager (FLM) failed to identify that pre-conditioning was taking place.

One smokehead did not actuate when simulated smoke was applied. The operators did not stop work and contact the FLM as required by the procedure but cleaned the smokehead again and retested it successfully. The inspectors also observed that the operators timed only one of the two safety valves per loop that were required to close when each smokehead was actuated. The pigtail isolation valves were timed; they closed almost immediately; however, two of the cylinder safety valves were sluggish and did not appear to close within the required five seconds.

The inspectors discussed the issues with the Plant Shift Superintendent (PSS) who maintained the system in an inoperable status pending further review. On July 6, plant staff performed the surveillance again and observed the same problems with smokeheads that failed to actuate and that had sluggish cylinder safety valves. In response to the smokehead issue, engineering performed an evaluation that determined that the concentration of smoke used in the testing was below that assumed in the Safety Analysis Report (SAR) accident analysis and that the smokeheads could perform their required safety function.

Engineering attributed the sluggish behavior of the safety valves to stroking them less frequently during cold standby operation. As corrective action, plant staff intended to revise the applicable operations procedure to stroke the valve prior to initiating withdrawal, which was the mode of operation required by the Technical Safety Requirements (TSR) in order for the valve to be operable. In response to the pre-conditioning issue, management issued a “lessons-learned” to alert personnel; management intended to revise the applicable test procedure to ensure that as-found testing was performed.

Technical Safety Requirement 3.9.1 required, in part, that written procedures shall be prepared, reviewed, approved, and implemented for activities described in Appendix A of SAR Section 6.11. Appendix A of SAR Section 6.11 described TSR surveillances as activities for which procedures shall be implemented. Step 8.1.6 of Procedure XP2-CO-CA2031, “Surveillance Of Pyrotronics Smoke Detection System For ERP Station In X-326 Building,” which implemented TSR Surveillance Requirement 2.5.3.3.2, required, in part, that when pigtail valve FV-110 and FV-110X stems indicated that the valves were closed, stop the calibrated timepiece used to measure valve closure. In addition, Step 8.1.9 of Procedure XP2-CO-CA2031 required, in part, that if the smoke detector did not actuate when exposed to simulated smoke, contact the Operations and

Maintenance FLMs to determine corrective actions. Contrary to the above, on July 2, the inspectors observed that operators stopped the timepiece before the pigtail valve FV-110 stem indicated that the valve was closed. In addition, when a smoke detector did not actuate when exposed to simulated smoke, plant staff did not contact the Operations and Maintenance FLMs to determine corrective actions before continuing with procedural steps. This is a **violation. (VIO 070-07002/2001-006-01)**

c. Conclusions

The inspectors identified procedural violations during ERP pyrotronics testing such that plant staff did not time closure of cylinder safety valves nor did they contact management when a smokehead failed to actuate upon exposure to simulated smoke. The inspectors also identified that plant staff pre-conditioned the smokeheads by cleaning them prior to testing them. Plant management took appropriate corrective action to address the deficiencies.

III. Engineering

E1 Conduct of Engineering

E1.1 Corroded Fire Water Sprinkler Heads (88100)

a. Inspection Scope

The inspectors reviewed the surveillance program for the fire water sprinkler system in response to problems with corroded heads.

b. Observations and Findings

On July 18, plant staff made a 24-hour notification to the NRC to report a safety system failure. The failure involved five adjacent sprinkler heads with visible corrosion in Building X-333. These corroded sprinkler heads were discovered during an annual visual inspection. The report was made because previous engineering reviews had concluded that TSR operability criteria may not have been maintained with more than four adjacent corroded heads. Upon discovery, the PSS declared the affected system inoperable and implemented the required compensatory actions until the heads were replaced. The PSS retracted the event on August 1, 2001, as discussed below.

As documented in Event Report 99-17, Revision 3, plant staff first discovered the problem with corroded sprinkler heads in 1997. Plant staff determined that the cause of the corrosion was due to residual deposits left by evaporating water that had leaked past the seat which, in turn, was due to corrosion of the copper gasket, causing the gasket to stick to the sprinkler head body. The potential impact was that the heads would not have actuated at available system pressure. As immediate corrective action, plant staff enhanced the annual surveillance to require a 100 percent visual inspection of the heads located in the cascade buildings.

The majority of the sprinkler heads in the cascade buildings were installed in the late 1950s and early 1960s. Since the heads had a life expectancy of at least 50 years, aging was not believed to be the root cause of the corrosion. A subsequent investigation determined that the corrosion of the gaskets was primarily due to microbiological influenced corrosion (MIC) and dissolved oxygen. Plant staff believed

that the corrosion process was gradual due to the low levels of sulfur-reducing bacteria in the water that contributed to MIC and infrequent water changes that minimized dissolved oxygen in the water. Inspection results have supported that theory as the number of corroded heads and the size of the deposits have decreased during more recent inspections.

To date, of the approximately 98,000 sprinkler heads located in the process buildings, the number discovered with deposits was approximately 800. Plant staff have performed lab tests on approximately 100 of the removed heads. The available pressure on the sprinkler systems varied from approximately 18 to 125 psig depending on the location of the heads, the elevation and number of heads operating, and associated friction losses. Approximately 76 percent of the heads tested actuated at less than the minimum 18 psig, and only two heads required a pressure above the static system pressure of 125 psig to actuate. The five corroded heads that resulted in the reportable event on July 18 all tested below 8 psig which was the basis for the report retraction.

Plant staff also performed an operability evaluation that determined that the system remained operable even when up to four adjacent heads with deposits were discovered, because of overlapping coverage of the sprinkler heads and the location of adjacent heads. Based on the relatively small number of heads found to be corroded and even fewer that would not have actuated at available system pressure, the inspectors concluded that the annual inspections were sufficient in ensuring sprinkler system operability.

c. Conclusions

The inspectors concluded that the annual inspection of the cascade sprinkler systems was sufficient to ensure system operability, based on the relatively small number of heads found to be corroded to date and even fewer that would not have actuated at available system pressure.

E8 Miscellaneous Engineering Issues

- E8.1 (Closed) IFI 70-7002/99007-02: Integrated review of liquid UF₆ cylinder handling. Plant management assembled a team that performed a design basis review and a safety system verification walkdown. The team concluded that the cranes met the standards for the critical characteristics described in the SAR. The team implemented some recommendations including the elimination of the use of railcars at Tails and enhancements to off-normal procedures. The inspectors have no further issues and this item is closed.

IV. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the facility management on July 30, 2001. The facility staff acknowledged the findings presented and indicated concurrence with the facts, as stated. The inspectors asked the plant staff whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

United States Enrichment Corporation

- P. Musser, General Manager
- * J. Anzelmo, Plant Services Manager
- * D. Couser, Training Manager
- * L. Cutlip, Engineering Manager
- * D. Fosson, Operations Manager
- S. Fout, Transfer and Shipping Plant Manager
- R. Lawton, Nuclear Safety & Quality Manager
- * P. Miner, Nuclear Regulatory Affairs Manager
- M. Wayland, Maintenance Manager
- R. Winegar, Cold Standby Program Manager
- G. Workman, Production Support Manager

*Denotes those present at the exit meeting on July 30, 2001.

INSPECTION PROCEDURES USED

- IP 88100: Plant Operations
- IP 88102: Surveillance
- IP 88103: Maintenance
- IP 90712: In-office Reviews of Written Reports on Non-routine Events

ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened</u>	<u>Item Type</u>	<u>Summary</u>
None		
<u>Closed</u>		
38149	CER	Safety System Failure; during an inspection of the High Pressure Fire Water Sprinkler System in Building X-333, five adjacent sprinkler heads were discovered with visible corrosion deposits
70-7002/99203-02	IFI	Plant management actions to review the conduct of operations in the cascade and other facilities to assure that operations were being conducted in accordance with plant procedures
70-7002/2001-006-01	VIO	Procedure violations during ERP Pyrotronics testing
70-7002/99007-02	IFI	Integrated review of liquid UF ₆ cylinder handling
<u>Discussed</u>		

None

LIST OF ACRONYMS USED

ACR	Area Control Room
ADAMS	Agencywide Documents Access and Management System
CER	Certificate Event Report
CFR	Code of Federal Regulations
DNMS	Division of Nuclear Material Safety
DOE	Department of Energy
ERP	Extended Range Product
FLM	First Line Manager
GDP	Gaseous Diffusion Plant
IFI	Inspection Follow-up Item
MIC	Microbiological Influenced Corrosion
NCS	Nuclear Criticality Safety
NCSA	Nuclear Criticality Safety Approval
No.	Number
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
PERR	Public Electronic Reading Room
PORTS	Portsmouth
PSS	Plant Shift Superintendent
SAR	Safety Analysis Report
TSR	Technical Safety Requirements
UF ₆	Uranium Hexafluoride
URI	Unresolved Item
USEC	United States Enrichment Corporation
VIO	Violation