



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
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ATLANTA, GEORGIA 30303-8931**

June 3, 2004

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

**SUBJECT: NRC INSPECTION REPORT 07007002/2004-003 (DFFI) - PORTSMOUTH**

Dear Mr. Brown:

On May 14, 2004, the NRC completed a routine 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 on May 14, 2004, the NRC inspectors discussed the findings with members of your staff.

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

Based on the results of this inspection, the NRC did not identify any violations.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so it can be made available to the Public without redaction.

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. 07007002  
Certificate No. GDP-2

Enclosure: (See Page 2)

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 T. A. Brooks, Manager, Nuclear Regulatory Affairs  
 R. Starkey, Paducah General Manager  
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No. 07007002

Certificate No. GDP-2

Report No. 07007002/2004-003

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: May 10 through 14, 2004

Inspectors: David J. Hartland, Senior Fuel Facility Inspector  
Omar R. Lopez, Fuel Facility Inspector

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

Enclosure

## EXECUTIVE SUMMARY

### United States Enrichment Corporation Portsmouth Gaseous Diffusion Plant NRC Inspection Report 07007002/2004-003(DFFI)

This routine announced inspection included aspects of certificatee environmental protection, chemical safety, fire safety, transportation, and waste management programs. The report covers regional inspection activities and includes follow-up of issues identified during previous inspections.

#### **Environmental Protection**

- The inspector concluded that environmental monitoring program activities reviewed were in accordance with certificate requirements. The projected offsite dose was well below the as low as reasonably achievable constraint of 10 millirem per year specified in 10 CFR 20.1101(d). (Paragraph 1.a)

#### **Chemical Safety**

- Safety analyses identified process hazard information appropriately. Safety significant controls reviewed appeared to be adequately implemented and maintained. The certificatee's program inventory of hazardous chemicals was adequate to control the chemical hazards. (Paragraph 2.a)
- Chemical operations were conducted with appropriate operating procedures, and operators were qualified to perform their work. (Paragraph 2.b)

#### **Fire Safety**

- The inspector concluded that emergency packets were maintained in accordance with certificatee procedures. Fire protection and detection equipment observed by the inspector was adequately maintained. Housekeeping was adequate to ensure fire hazards were minimized. (Paragraph 3.a)

#### **Transportation**

- The activities associated with the preparation and delivery of shipping containers were conducted in a safe manner and in accordance with regulatory requirements. Within the areas examined, controls were in place and properly implemented to ensure that shipping containers were radiologically safe and all communications regarding the container contents were appropriately displayed. (Paragraph 4.a)

#### **Waste Management**

- The inspector did not identify any violations of certificate requirements during review of waste management activities. (Paragraph 5.a)

Attachments: (See Page 2)

Attachments:

Report Details

Partial List of Persons Contacted

Inspection Procedures Used

List of Items Opened, Closed, and Discussed

List of Acronyms

## REPORT DETAILS

### 1. Environmental Protection (IP 88045)

- a. Monitoring Stations (R2.05)  
Monitoring Programs Reports (R2.06)  
Radioactive Airborne Effluents (R3.02)

#### (1) Inspection Scope

The inspector reviewed selected portions of the certificatee's environmental protection program to verify that program implementation and sample results were consistent with certificate requirements and to determine that radioactivity was not accumulating in environmental media as a result of plant operations. The inspector reviewed the facility's airborne effluent results to verify that releases were within 10 CFR Part 20 limits.

#### (2) Observations and Findings

The inspector reviewed selected results from soil, animal, sediment, vegetation, and environmental water samples collected in calendar year 2003 and the first quarter of 2004. The inspector observed that gross alpha, gross beta, and uranium values consistently remained below certificate plant action levels.

The inspector also observed the collection of environmental water samples at different locations upstream and downstream of the facility. The technician followed the preparation and collection steps specified in the procedure. The inspector also observed the chain of custody process for the environmental water samples. No problems were identified.

The inspector reviewed vent sampling results and quantities of airborne radioactive materials released for calendar year 2003 and the first quarter of 2004. The inspector noted that uranium emissions from the Building X-343 cold trap vent exceeded plant action levels during the months of July through December 2003. The inspector noted that the certificatee issued two plant action level exceedance investigation reports. In the reports, the certificatee determined that the increase in emissions was due to increased waste gas generation during a campaign of cylinder valve post maintenance testing in the facility.

The projected calendar year 2003 total offsite dose due to all radionuclide effluents was calculated to be 0.03 millirem. The inspector determined that the projected offsite dose was well below the as low as reasonably achievable constraint of 10 millirem per year specified in 10 CFR 20.1101(d).

#### (3) Conclusions

The inspector concluded that environmental monitoring program activities reviewed were in accordance with certificate requirements. The projected offsite dose was well below the as low as reasonably achievable constraint of 10 millirem per year specified in 10 CFR 20.1101(d).

## 2. Chemical Safety (IP 88051-63)

### a. Hazard Identification and Assessment (IP 88057) Detection and Monitoring (IP 88060)

#### (1) Inspection Scope

The inspector reviewed the applicable sections of the Safety Analysis Report (SAR) for Buildings X-344, X-343, X-342, and X-330 to ensure that they contained process hazard information and safety-related controls for the existing plant configuration. The inspector examined calibration, preventive maintenance, and functional records for a selection of safety significant controls. The inspector also examined the certificatee's inventory of hazardous chemicals.

#### (2) Observations and Findings

The inspector noted that the SAR identified systems with potential chemical hazards that could affect the operation with special nuclear materials. The inspector walked down safety significant controls for Building X-344 and the chlorine trifluoride (ClF<sub>3</sub>) tank in Building X-330 with operations personnel. The inspector confirmed that active and passive engineered controls and administrative controls that were referenced in the SAR were maintained and implemented adequately.

The inspector also interviewed certificatee personnel regarding the inspection, testing, and maintenance of safety controls for the ClF<sub>3</sub> tank and autoclaves. The inspector reviewed maintenance and inspection records for selected safety controls such as high pressure alarms, uranium hexafluoride (UF<sub>6</sub>) detection systems, pigtail high pressure alarms, and pigtail line isolation systems. The inspector determined that maintenance for safety controls was current and that the procedures used to perform the tests contained adequate detail.

The inspector toured Buildings X-344, X-343, X-342, X-742, X-705 and X-330. During the plant tours, the inspector noted that postings and procedures were available to the operators. The inspector observed that plant personnel wore the proper personal protective equipment. Safety showers and eye wash stations throughout the facility were in satisfactory condition and had been tested regularly. The inspector did not observe any issues where housekeeping could affect the radiological safety or emergency egress of the facility.

During plant tours, the inspector noted that in areas where chemical cylinders were stored and used, appropriate operator aids were posted listing the approved number of cylinders that were allowed in the area. The inspector reviewed and discussed with certificatee personnel the latest emergency and hazardous chemical inventory report. The inspector determined that the certificatee had information on the quantities, forms, and storage locations of the most hazardous chemicals on site.

(3) Conclusions

Safety analyses identified process hazard information appropriately. Safety significant controls reviewed appeared to be adequately implemented and maintained. The certificatee's program inventory of hazardous chemicals was adequate to control the chemical hazards.

b. Standard Operating Procedures (IP 88058)  
Chemical Safety Training (IP 88061)(1) Inspection Scope

The inspector observed operations throughout the facility and reviewed selected operating procedures to verify that appropriate procedures were being used. The inspector reviewed training documentation to verify that operators were qualified to perform their work.

(2) Observations and Findings

The inspector observed cell treatment activities in Building X-330. The inspector noted that the operator was knowledgeable of the operating procedures and safety precautions related to the job. The inspector noted that the operating procedures adequately identified safety significant controls and addressed process parameters and steps to mitigate unusual events.

On May 11, 2004, Autoclaves Nos. 2 and 4 in Building X-344 entered containment mode after a failure of the master autoclave relay (MAR). The MAR failure triggered the local UF6 release alarm on all of the autoclave control panels, but no indication of UF6 release was observed. Operations personnel implemented the required alarm response procedures, and all the safety controls performed their intended safety functions.

In order to replace the MAR and restore the system, the licensee implemented the infrequently performed tests or evolutions (IPTE) process. The IPTE process provided guidance for identification and increased management awareness when conducting activities which may have the potential to place plant equipment and personnel outside the bounds of normal operating procedures and training. The inspector reviewed the pre-job briefing summary, work instructions, and the attendance sheet for the briefing. No problems were identified.

The inspector reviewed training documentation for several operators currently working in Building X-344 to verify that they were qualified to perform their work. The inspector noted that the required training included safety and health hazards, safety significant controls, hazard communication, and housekeeping. The inspector determined that operators were appropriately qualified for their positions.

(3) Conclusions

Chemical operations were conducted with appropriate operating procedures, and operators were qualified to perform their work.



### 3. **Fire Safety (IP 88055)**

- a. Fire Safety of Process, Equipment, and Storage Areas (O4.04)  
Fire Protection Systems (O4.05)  
Pre-Fire Plan (O4.07)

(1) Inspection Scope

The inspector performed walk-down inspections and reviewed test results to ensure proper inspection, testing, and maintenance (ITM) of key fire safety systems and equipment important to safety. The inspector also reviewed other documentation to assess compliance with certificate requirements. The inspector reviewed the certificatee's emergency packets to determine if they had been updated in accordance with certificatee procedures.

(2) Observations and Findings

The inspector observed that the emergency packets identified the location of fire fighting equipment such as portable extinguishers, automatic fire suppression systems, hydrants, and fire hoses. Also, the packets included a description of the site areas, hazardous chemical and material safety data sheets, combustible materials, and fire hazards in each area.

During the review, the inspector noted that several packets had not been updated in a timely manner. The inspector also noted that the certificatee had previously identified this problem during a self-assessment. The certificatee entered this problem into their corrective actions program. The inspector reviewed the changes to the packets and determined that they were administrative changes with no impact on the safety of the plant.

The inspector conducted walk-down inspections of UF6 process areas. Portable fire extinguishers were charged to the normal operating zones and no visible damage was noted. The inspector observed that fire doors throughout the facility were in proper working condition and that emergency egress pathways were clear of obstructions. The inspector noted that housekeeping was adequate and that areas were kept free of transient combustibles large enough to be a fire exposure hazard.

The inspector reviewed functional test records and examined equipment for selected fire protection systems including pumps and valves, smoke detectors, fire alarm systems, and sprinkler systems. The inspector determined that the ITM for the fire protection systems reviewed was adequate and that the equipment was maintained in proper condition for use.

(3) Conclusions

The inspector concluded that emergency packets were maintained in accordance with certificatee procedures. Fire protection and detection equipment observed by the inspector was adequately maintained. Housekeeping was adequate to ensure fire hazards were minimized.

#### **4. Transportation (86740)**

##### (1) Inspection Scope

Transportation activities associated with the packaging and shipment of radioactive materials were reviewed to verify they were conducted in accordance with NRC and Department of Transportation regulations.

##### (2) Observations and Findings

The inspector observed limited aspects of container preparation and vehicle loading and determined that the appropriate surveys were taken to verify that radiation and contamination levels were within allowable limits and that appropriate container labeling/markings had been applied. Shipping papers included the appropriate information, and the 24-hour emergency response telephone number was verified as current by the inspector. Training for packaging and transport personnel was current and consistent with the requirements in 49 CFR Part 172 Subpart H.

##### (3) Conclusions

The activities associated with the preparation and delivery of shipping containers were conducted in a safe manner and in accordance with regulatory requirements. Within the areas examined, controls were in place and properly implemented to ensure that shipping containers were radiologically safe and all communications regarding the container contents were appropriately displayed.

#### **5. Waste Management (84850, 84900, and 88035)**

##### a. Inspection Scope

The inspector reviewed waste management activities to ensure that they were being conducted in accordance with certificate requirements. In addition, the inspector toured radioactive waste storage and processing areas.

##### b. Observations and Findings

The inspector toured radioactive waste storage and processing areas and observed that the areas were well maintained and that packages were properly tagged. The material condition of the waste storage areas was good. No evidence of water intrusion into the building or significant degradation of equipment or containers was noted. The personnel in the area were knowledgeable.

The inspector verified compliance with posted criticality controls by randomly checking that the uranium mass and assay were quantified and documented on tags attached to the containers. The physical and chemical characteristics of the containers were properly documented and inventory records were also being properly maintained.

c. Conclusions

The inspector did not identify any violations of certificate requirements during review of waste management activities.

6. **Miscellaneous Open Item Closure (92701)**

(Closed) CER 40599 (ER 04-01): Actuation of the high condensate level steam shutdown safety system on Autoclave No. 5 in Building X-343. The plant staff determined that the cause of the actuation was a failed pressure regulator in the steam loading system, which caused the autoclave steam pressure to drop too low such that it was unable to provide sufficient motive force for condensate drain flow from the autoclave. The plant staff replaced the failed components, tested the system, and returned the autoclave to service without incident. The plant staff determined that no additional actions were required, as the component failure was an isolated incident. The inspector had no further issues, and this item is closed.

7. **Exit Meeting Summary**

The inspectors presented the inspection results to the members of facility management on May 14, 2004. The inspectors asked the certificatee staff whether any materials examined during the inspection should be considered proprietary. The certificatee staff did not identify any of the materials as proprietary.

## ATTACHMENT

### 1. PARTIAL LIST OF PERSONS CONTACTED

#### United States Enrichment Corporation

P. Musser, General Manager  
J. Anzelmo, Plant Services Manager  
\*R. Bouts, Training Manager  
T. Brooks, Nuclear Regulatory Affairs Manager  
T. Canterbury, Engineering Manager  
\*M. Conkel, Maintenance Manager  
L. Cutlip, Contaminated Feed Manager  
D. Fosson, Operations Manager  
\*S. Fout, Plant Manager  
\*R. Lawton, Nuclear Safety & Quality Manager  
\*G. Workman, Production Support Manager

\*Denotes those present at the exit meeting on May 14, 2004.

### 2. INSPECTION PROCEDURES USED

IP 84850	Waste Management
IP 84900	Waste Storage
IP 86740	Transportation
IP 88035	Waste Management
IP 88045	Environmental Protection
IP 88055	Fire Protection
IP 88057	Hazard Identification and Assessment
IP 88058	Standard Operating Procedures
IP 88060	Detection and Monitoring
IP 88061	Chemical Safety Training

### 3. ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Type</u>	<u>Summary</u>
40599 (ER 04-01)	Closed	CER	Actuation of the high condensate level steam shutdown safety system on Autoclave No. 5 in Building X-343.

### 4. LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CER	Certificate Event Report
CFR	Code of Federal Regulations
CIF3	Chlorine Trifluoride
DOE	Department of Energy
GDP	Gaseous Diffusion Plant

IP	Inspection Procedures
IPTE	Infrequently Performed Test or Evolutions
ITM	Inspection Testing and Maintenance
MAR	Master Autoclave Relay
NMSS	NRC's Office of Nuclear Materials Safety and Safeguards
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
PDR	Public Document Room
PORTS	Portsmouth Gaseous Diffusion Plant
SAR	Safety Analysis Report
UF6	Uranium Hexafluoride
USEC	United States Enrichment Corporation