# U.S. NUCLEAR REGULATORY COMMISSION

# **REGION III**

Docket No: Certificate No:	70-7002 GDP-2
Report No:	70-7002/98012(DNMS)
Facility Operator:	United States Enrichment Corporation
Facility:	Portsmouth Gaseous Diffusion Plant
Location:	3930 U.S. Route 23 South P.O. Box 628 Piketon, OH 45661
Dates:	July 27 through July 31, 1998
Inspector:	R. G. Krsek, Fuel Cycle Safety Inspector
Approved By:	Timothy D. Reidinger, Acting Chief Fuel Cycle Branch Division of Nuclear Materials Safety

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# EXECUTIVE SUMMARY

# United States Enrichment Corporation Portsmouth Gaseous Diffusion Plant NRC Inspection Report 70-7002/98012(DNMS)

# Plant Operations

- The inspector concluded that the incident command system exhibited an overall effective response during a "see and flee" event which occurred in Building X-333 on July 27. In addition, a review of training records for members of the Emergency Squad participating in the response revealed that the members' training was up to date and current. (Section O1.1)
- The inspector identified an apparent inconsistency with the resolution of Compliance Plan Item No. 3 for autoclave upgrades in that pressure relief was not provided for cylinders heated in autoclaves at the facility. At the end of the inspection, Autoclave No. 6, the first autoclave required to be upgraded and in full compliance with the Certificate, was inoperable. The inspector determined that no immediate safety concerns existed, and an Unresolved Item was identified to track the resolution of the apparent inconsistency in pressure relief for cylinders heated in the autoclave. (Section O1.2)

#### Maintenance

- The inspector observed the completion of a post-maintenance test for the tails withdrawal station smoke detection system, after the replacement of smoke detection system backup batteries. The inspector noted that both maintenance and operations staff exhibited a questioning attitude during the initial review and performance of work associated with the smoke detection system. (Section M1.1)
- The inspector reviewed applicable Technical Safety Requirement surveillances for the Building X-705 microfiltration system and identified no concerns. The inspector noted that engineering staff addressed issues concerning the microfiltration pH instrumentation with conservative engineering evaluations, ensuring the facility was operated in accordance with regulatory requirements. (Section M1.2)

# Plant Support

 The inspector reviewed a supplemental corrective action plan and schedule submitted to the NRC to enhance the effectiveness of the Training Organization. In addition, a weakness identified with front-line management's ability to utilize a training tool was effectively addressed in a timely manner during the inspection. (Section T1.1)

# **Report Details**

## I. Operations

#### O1 Conduct of Operations

# O1.1 Response to See and Flee Event at Building X-333

#### a. Inspection Scope (88020 and 88010)

The inspector observed plant staff's response to a "see and flee" event which occurred at Building X-333 on July 27. The inspector also reviewed the training of the Emergency Squad (E-Squad) members who participated in the event response on July 27.

#### b. Observations and Findings

At approximately 9:30 a.m. on July 27, while maintenance staff began removal of a blowout preventer (BOP) from the Cell 33-6-9 Stage 8 compressor in Building X-333, a release of uranium hexafluoride (UF<sub>6</sub>) occurred. Maintenance staff immediately initiated a "see and flee" and the Plant Shift Superintendent's office initiated an E-Squad response to Building X-333. The inspector reported to the incident command post to observe the incident commander and E-Squad members' activities. Both the Fire Department and Health Physics E-Squad entry teams determined that there was no ongoing release at the Stage 8 compressor, and that the operating floor of Building X-333 had no detectable airborne radiation contamination. Approximately 1 hour after the initial E-Squad entry was made into Building X-333, the incident commander declared an "all clear" and terminated the E-Squad response. During observation at the incident command post, the inspector noted good communications among E-Squad members, conservative safety-based judgements by the incident commander, and the effective implementation of the incident command system, as documented in Procedure XP2-EP-EP1055, "Incident Command System."

The inspector did note that radio transmissions from E-Squad entry team members was difficult to interpret, due to significant background noise during some radio transmissions. However, in discussions with the incident commander after the incident, the inspector noted that previous actions were underway by the certificatee to evaluate this issue. The inspector also noted that during the response, several radio transmissions were made over the emergency channel radio frequency by plant staff not associated with the emergency response. The transmissions did not affect the effectiveness of the E-Squad's response to this incident; however, in accordance with plant policy, plant staff not associated with the response were prohibited from using the emergency channel radio frequency. Plant staff appropriately and immediately addressed this issue during and after the response.

After the response, the inspector reviewed the training records of randomly selected members of the E-Squad who participated in this response. Selected training codes and matrices, in addition to Procedure XP2-SF-SF1031, "Administration of Emergency Squad," documented the training required for E-Squad members. The inspector reviewed 10 E-Squad members' training records and noted that all the required training was current and up to date.

#### c. Conclusion

The inspector concluded that the incident command system exhibited an overall effective response during a "see and flee" event which occurred in Building X-333 on July 27. In addition, a review of training records for members of the E-Squad participating in the response revealed that the members training was up to date and current.

## O8 Miscellaneous Operations Issues

#### O8.1 Autoclave Upgrades - Compliance Plan Issue No. 3

#### a. Inspection Scope (88020)

The inspector reviewed the completion of actions to address noncompliances identified in Compliance Plan Issue No. 3. In particular, the inspector reviewed actions completed for Autoclave No. 6 in Building X-343. The purpose of the review was to determine if Autoclave No. 6 was in compliance with the current Certificate.

#### b. Observations and Findings

The "Plan for Achieving Compliance with NRC Regulations at the Portsmouth Gaseous Diffusion Plant," (Compliance Plan) described NRC regulatory issues for which the plant was not in compliance with the Certificate upon transition from Department of Energy (DOE) to NRC regulatory oversight on March 3, 1997. The Compliance Plan also documented a plan of action and schedule for achieving compliance with the regulatory noncompliances, identified in each compliance plan issue. Compliance Plan Issue No. 3 addressed 10 regulatory noncompliances associated with the 13 autoclaves at the Portsmouth plant. The inspector focused the inspection activities on Noncompliance Item No. 9, which stated, in part, that UFs cylinders were not provided with pressure relief protection. Item No. 9 of the plan of action and schedule stated the following, "A code interpretation from the ASME [American Society of Mechanical Engineers] Code Committee will be obtained regarding the need for pressure relief for the UFs cylinders. Based on this interpretation, the need for modifications to the affected system operations will be assessed. Both the ASME Code interpretation and the assessment results will be submitted to NRC for review and approval." Items 1 and 10 of the plan of action were completed by July 1, 1997 and December 31, 1996, respectively. The remaining eight action items (two through nine) to bring the first of thirteen autoclaves onsite into full compliance with the NRC Certificate, were required to be complete by May 1, 1998. The remaining twelve autoclaves were required to be upgraded by February 1, 2001, with a retailed schedule for completion of the remaining autoclaves available for review by March 31, 1998.

On November 5, 1996, the United States Enrichment Corporation (USEC) received correspondence on the ASME Code Committee regarding the code interpretation which USEC requests. ASME Code Committee interpretation stated that, "it would appear that the requirements of UG-125(a) in Section VIII, Division 1 are invocable." This correspondence was transmitted to the NRC from USEC in a December 31, 1996, letter (GDP-96-0206). Several other letters were transmitted between USEC and NRC, and on February 9, 1998, USEC transmitted the assessment of the need for modification to the affected system operations to the NRC for review and approval (GDP-98-0017). The USEC concluded in this correspondence that based on positive controls already in place, no modifications were necessary for the autoclaves for pressure relief protection. On June 10, 1998, the NRC responded to the February 9, 1998, USEC correspondence and

concluded: "The NRC staff is not in position to establish an ASME Code interpretation that positive control of an external heating source would obviate the need for a protective device. The staff recommends that USEC comply with the Code, pursue an ASME Code interpretation from ASME, or seek relief from the protective device provision for this externally heated transfer system from NRC."

During discussions with operations staff, the inspector learned that Autoclave No. 6 in Building X-343, the first of the thirteen autoclaves upgraded as part of Compliance Plan Issue No. 3, was declared operable in May 1998. Approximately ½ hour into the first heating cycle for the newly upgraded autoclave, a valid condensate safety system actuation occurred, following which the autoclave was declared inoperable. Autoclave No. 6 was still inoperable at the time of this inspection, due to condensate drain design concerns. The inspector then queried plant staff as to whether or not Autoclave No. 6 was currently in compliance with the Certificate, as the issues surrounding Compliance Plan Issue No. 3, Noncompliance Item No. 9 had still not been resolved before the first upgraded autoclave had been declared operable. The Acting Nuclear Regulatory Affairs Manager and plant staff highlighted to the inspector that Plan of Action Item No. 9, only required the plant seek an ASME Code Committee interpretation, perform an assessment, and submit the assessment to the NRC, which was completed in the February 10, 1998 correspondence.

At the end of the inspection, Autoclave No. 6 in Building X-343 was still inoperable and the Portsmouth General Manager stated that this issue would be resolved prior to Autoclave No. 6 being declared operable. In addition, engineering staff consulted with the ASME Code Committee on July 31 and determined that ASME Code Case 2211, dated August 12, 1996, may address the resolution of Noncompliance Item No. 9, for Compliance Plan Issue No. 3. Based on the actions described above, the Justification for Continued Operation contained in Compliance Plan Issue No. 3 for autoclaves, and the positive controls of the external heating source for UF<sub>6</sub> cylinders currently in place, the inspector determined that no immediate safety concern existed. The resolution of the above stated issues associated with Compliance Plan Item No. 3, Noncompliance Item No. 9 will be tracked as an Unresolved Item (URI) 70-7002/98012-01.

c. Conclusion

The inspector identified an apparent inconsistency with the resolution of Compliance Plan Item No. 3 for autoclave upgrades in that pressure relief was not provided for cylinders heated in autoclaves at the facility. At the end of the inspection, Autoclave No. 6, the first autoclave required to be upgraded and in full compliance with the Certificate, was inoperable. The inspector determined that no immediate safety concerns existed, and an URI was identified to track the resolution of the apparent inconsistency in pressure relief for cylinders heated in the autoclave.

O8.2 (Closed) IFI 070-7002/97003-12: Review pending chemistry laboratory procedure revisions. This item was opened due to the significant number of radiochemistry procedures which were out of date (40 of 41) and due to be completed. The inspector verified the required reviews to radiochemistry laboratory procedures were made through reviews of the current radiochemistry laboratory procedure manuals and review of closure information provided by regulatory affairs staff. The inspector also reviewed a select number of procedures and determined that the procedure content was reviewed and updated. This item is closed.

## II. Maintenance

#### M1 Conduct of Maintenance

#### M1.1 Post-Maintenance Test of Tails Withdrawal Station Smoke Detection System

#### a. Inspection Scope (88025)

The inspector observed maintenance activities associated with the tails withdrawal station smoke detection (Pyrotronics) system. The inspection consisted of maintenance work package and procedure reviews, interviews with maintenance and operations staff, and observation of work activities and crew briefings.

#### b. Observations and Findings

The tails withdrawal station smoke detection system provides an alarm to operations staff in the event of a UF<sub>6</sub> release. In addition, upon actuation of the two smoke detectors above a withdrawal station, isolation valves for the tails withdrawal system were required to close to minimize the quantity of UF<sub>6</sub> released. In June 1998, plant staff noted that a smoke detection trouble alarm was activated due to a low back-up battery indication for the smoke detection system. All the tails withdrawal stations were declared inoperable at the time the low battery condition was discovered. During this inspection period. maintenance staff replaced the back-up batteries. The post-maintenance test for the battery replacement required that the Technical Safety Requirement surveillance for the smoke detection system be performed. The inspector observed that the original postmaintenance test for the battery replacement work package required the surveillance be performed while the smoke detection system operated on normal AC power. However, operations and maintenance staff, during the work package review, recognized that the post-maintenance test surveillance should be performed using the back-up battery power. to ensure the batteries were properly installed and the back-up system was functioning as required.

After the work package was revised and re-approved, the inspector observed the pre-job briefing, conducted with maintenance and operations staff, and the actual postmaintenance testing. Maintenance and operations staff followed the action steps in the work instructions for Maintenance Work Package No. R9820896-01 and the applicable steps in Procedure XP4-OM-EM6202, "Technical Safety Requirement Maintenance Surveillance of Pyrotronics Smoke Detection System in X-330 Building." In addition, operations staff in the Building X-330 area control room were informed prior to the activation of any smoke detection system. The post-maintenance testing was successful overall. However, while the back-up system operated properly, a solenoid on the air-to-close tails cylinder isolation valve at the No. 3 tails withdrawal station did not function properly. In addition, the inspector noted that during the post-maintenance testing evolution, maintenance staff identified several procedure enhancements which could potentially improve the maintenance activity.

The inspector reviewed the completed maintenance work package, prior to the final closeout, and noted no concerns. The maintenance work package, and maintenance evolution were performed in accordance with Procedure XP2-GP-GP1030, "Work Control Process." The inspector also noted that the work-in-progress log documented the relevant issues associated with this maintenance evolution.

#### c. Conclusions

The inspector observed the completion of a post-maintenance test for the tails withdrawal station smoke detection system after the replacement of smoke detection system back-up batteries. The inspector noted that both maintenance and operations staff exhibited a questioning attitude during the initial review and performance of work associated with the smoke detection system.

#### M1.2 Building X-705 Microfiltration Technical Safety Requirement Surveillances

#### a. Inspection Scope

The inspector reviewed the Technical Safety Requirement surveillances and associated work packages for the Building X-705 microfiltration pH shutdown system and permeate effluent bag filler system. The inspector also interviewed operations staff regarding the surveillances.

#### b. Observations and Findings

Technical Safety Requirement Surveillances 2.6.3.5.1 and 2.6.3.5.2 required quarterly functional tests of the microfiltration pH shutdown system. The purpose of the pH shutdown system was to ensure there was not a sufficient amount of uranium in an effluent stream, entering an effluent tank, to cause a critical nuclear excursion. Technical Safety Requirement Surveillances 2.6.3.6.1 and 2.6.3.6.2 required quarterly functional tests and system calibrations for the microfiltration permeate effluent bag filter system to ensure the system would prevent the discharge of solids to an effluent tank.

The inspector reviewed the maintenance work packages for all four surveillances for the past two quarters. The inspector noted no concerns with the maintenance work packages. The work documented in the work packages was done in accordance with Procedure XP2-GP-GP1030, "Work Control Process." The surveillances were performed at the required frequency and the testing appeared successful. However, the inspector noted that the last calibration of the microfiltration pH shutdown instrumentation documented an as-found instrument tolerance drift rate greater than expected. Operations staff highlighted this as a recent issue and identified that an engineering evaluation was performed to address the issue. Engineering Evaluation No. EVAL-PS-1998-0057, dated July 25, 1998, was obtained and reviewed by the inspector.

The evaluation contained a thorough review of past operating occurrences with the pH instrumentation, and documented that at the current increased rate of pH instrumentation drift, the Technical Safety Requirement tolerance would be exceeded in 10.5 days. The engineer subsequently recommended that in order to operate the system, the calibration check must be performed every seven to 10 days, so as not to exceed the required instrument tolerance. The inspector followed up with operations staff, to determine how this new calibration frequency was implemented. On July 27, Daily Operating Instruction DOI-705-98-13 was issued which required plant staff to perform the calibrations at least every 10 days and to continue to closely monitor microfiltration batch processing rates between calibrations, to determine if a correlation existed with the instrumentation drift rate. The inspector noted that plant staff actively addressed this issue and no concerns were identified.

#### c. Conclusion

The inspector reviewed applicable Technical Safety Requirement surveillances for the Building X-705 microfiltration system and identified no concerns. The inspector noted that engineering staff addressed issues concerning the microfiltration pH instrumentation with conservative engineering evaluations, ensuring the facility was operated in accordance with regulatory requirements.

#### M8 Miscellaneous Maintenance Issues

- M8.1 (Closed) VIO 070-7002/98004-01: Failure to stop work during an instrumentation and control maintenance activity when procedural steps could not be adhered to. While performing maintenance work in Building X-705, maintenance staff and management initially failed to stop work when the action steps in the applicable procedure could not be performed as written. The inspector reviewed the certificatee's April 27, 1938, violation response and noted no concerns. A review of lessons learned and industry transition training provided to all maintenance staff, as part of the corrective actions for this issue, was also conducted. Finally, during routine tours and observations, the inspector randomly interviewed maintenance staff concerning procedure use and noted that staff were knowledgeable of the requirements for following action steps in procedures and stopping work when action steps could not be performed. This item is closed.
- M8.2 (Closed) VIO 070-7002/98002-02: Failure to initiate problem reports for safety, operating, and regulatory noncompliance issues to ensure corrective actions were tracked and implemented for the issues. This finding involved the failure to initiate problem reports, for policy and procedural violations in both the laboratory and transportation areas, in order to promptly identify and correct as soon as practical, conditions which were adverse to quality. The inspector reviewed laboratory staff training conducted to address several issues regarding the laboratory fume hoods and noted the training adequately addressed the root cause of the violation. The inspector also randomly verified that fume hood surveillances were current. In regards to issues associated with transportation deficiencies of site, the inspector noted that corrective actions were documented and the root cause of the finding was addressed. The inspector also conducted a random sampling of the problem reporting system at Portsmouth and verified that transportation deficiencies identified by other fuel cycle facilities upon receipt of Portsmouth transportation shipments were currently handled in accordance with site policy and procedures. This item is closed.

# IV. Plant Support

# 16 Training Organization and Administration

- 16.1 Review of Training Organization Corrective Action Plan
  - a. Inspection Scope (88010 and 88005)

The inspector reviewed a supplemental corrective action plan with Training Organization management. The plan provided enhancements to increase the overall effectiveness of the Training Organization. During routine tours throughout the inspection, interviews were conducted with various maintenance and operations front-line managers concerning the resources available to a manager for assessing whether an employee was qualified to perform a job.

#### b. Observations and Findings

On July 24, 1998, USEC transmitted a supplemental response (GDP-98-2037) to a Notice of Violation from Inspection Report 70-7002/98008. The response addressed additional planned corrective actions to enhance the overall effectiveness of the Training Organization at Portsmouth. The response was provided due to the complexities of issues associated with the Training Organization as a whole, which were highlighted by numerous training program deficiencies in both NRC inspection reports and Portsmouth Quality Assurance Organization audits. The inspector interviewed the Training Organization and Group managers, and reviewed the three corrective actions already taken and eight corrective actions planned to be taken, which were either on schedule or in some cases ahead of schedule. The inspector acknowledged that if fully implemented, the corrective actions would enhance the overall effectiveness of the Training Organization.

During discussions with Training Organization staff, the inspector noted that one tool managers could use to ensure workers were qualified to perform a job was to access a computerized training database. During the inspection, when the inspector queried maintenance and operations front-line management on how to use the database, several managers were not able to fully utilize the training database. However, the inspector also noted that the managers highlighted several other ways to obtain the training information needed. All managers interviewed stated that if a worker's training was in question and training information could not be verified, the work would not be performed. Training Organization management acted quickly to correct this weakness. On July 29, a memorandum was issued to all supervisors onsite addressing how to access an individual's completed training status on the database. The inspector noted no other concerns with this issue.

#### c. Conclusion

The inspector reviewed a supplemental corrective action plan and schedule submitted to the NRC to enhance the effectiveness of the Training Organization. In addition, a weakness identified with front-line management's ability to utilize a training tool was effectively addressed in a timely manner during the inspection.

#### V. Management Meetings

# X1 Exit Meeting Summary

The inspector presented the inspection results to members of the plant staff and management at the conclusion of the inspection on July 31, 1998. Plant staff acknowledged the findings presented at the meeting. The inspector 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

#### Lockheed Martin Utility Services (LMUS)

- \* J. Brown, General Manager
- \* S. Casto, Work Control Manager
- \* M. Conkel, Acting Maintenance Manager
- \* S. Fout, Operations Manager
- \* J. Morgan, Enrichment Plant Manager
- \* P. Musser, Training and Procedures Organization Manager
- \* R. Smith, Production Support Manager
- \* D. Waters, Acting Nuclear Regulatory Affairs Manager
- \* Denotes those present at the exit meeting on July 31, 1998.

#### INSPECTION PROCEDURES USED

- IP 88005: Management and Organization
- IP 88010: Operator Training and Re-Training
- IP 88020: Operational Safety Review
- IP 88025: Maintenance and Surveillance Testing
- IP 92702: Follow-up on Violations/Deviations

### ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened

070-7002/98012-01	URI	Issue regarding an apparent regulatory noncompliance for the first autoclave upgraded as a part of Compliance Plan Issue No. 3
Closed		
070-7002/97003-12	IFI	Review pending chemistry laboratory procedure revisions.
070-7002/98004-01	VIO	Failure to stop work during an instrumentation and control maintenance activity when procedural steps could not be followed.
070-7002/98002-02	VIO	Failure to initiate problem reports for safety, operating, and regulatory noncompliance issues to ensure corrective actions are tracked and implemented for the issues.

#### Discussed

None

# LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
BOP	blow-out preventer
DNMS	Division of Nuclear Materials Safety
DOE	Department of Energy
E-Squad	Emergency Squad
IFI	Inspection Follow-up Item
LMUS	Lockheed Martin Utility Services
UF <sub>6</sub>	uranium hexafluoride
URI	Unresolved Item
USEC	United States Enrichment Corporation
VIO	Violation

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