U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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| Docket No: | 70-7002 |
| Certificate No: | GDP-2 |
| Report No: | 70-7002/97003(DNMS) |
| Applicant: | United States Enrichment Corporation |
| Facility Name: | Portsmouth Gaseous Diffusion Plant |
| Location: | 3930 U.S. Route 23 South<br>P.O. Box 628<br>Piketon, OH 45661 |
| Dates: | April 7 through May 18, 1997 |
| Inspectors: | C. R. Cox, Senior Resident Inspector<br>D. J. Hartland, Resident Inspector<br>R. G. Krsek, Regional Fuel Facilities Inspector |
| Approved By: | Patrick L. Hiland, Chief<br>Fuel Cycle Branch |

EXECUTIVE SUMMARY

United States Enrichment Corporation
Portsmouth Gaseous Diffusion Plant
NRC Inspection Report 70-7002/97003(DNMS)

This inspection report includes aspects of plant operations, maintenance, engineering, and plant support. The report covers a six-week period of routine resident inspections.

Plant Operations

- Procedural inadequacies regarding the lack of rigor in complying with refeeding operations were similar examples of problems in the conduct of operations noted in previous reports. One non-cited violation (NCV) was identified (Section O1.1).

- A potential unreviewed safety question (USQ) was identified due to a screen located in a condensate drain in an autoclave above a level probe. The screen could become clogged resulting in a high water level in the autoclave without a safety system actuation on high condensate level (Section O1.2).

- Repeated safety system actuations of the high condensate level system (HCLS) for the X-344 autoclaves indicated that past corrective actions were ineffective; one violation was identified (Section O1.3).

- Two NCVs were identified due to procedure adherence problems. Plant management took appropriate action to stress the importance of procedural adherence (Section O1.4).

Maintenance and Surveillance

- One violation was identified for a failure to follow a Technical Safety Requirement (TSR) limiting condition for operation (LCO) action statement. The inspectors continue to focus attention on implementation of TSR requirements. The inspectors also noted the LCO tracking system was informal (Section M1.1).

- The new surveillance program for cut-out equipment failed to have a nuclear criticality safety approval (NCSA) for equipment identified, and one violation was identified. The event was an example of the facility staff looking for hazards, but not having planned contingencies to handle the hazards identified discussed in previous reports (Section M1.2).

Engineering

- One NCV was identified for the certificate holder's identification and corrective actions for emergency lighting deficiencies (Section E2.1).

- Design calculations for older H-Frames were not immediately available for the inspectors' review. The newer H-Frame calculations provided a basis for the assumed safety margin contained in the TSRs. One followup item was identify to review additional calculations for the older H-Frames.

Plant Support

- Untimely pursuit of a potential safety issue resulted in one violation. The facility, including senior management, was notified on two occasions regarding the valve and timing issues prior to the cited shipment which provided opportunities to recognize the non-conformance with the Certificate of Compliance (CofC).

- Plant procedures concerning onsite air monitoring were up to date and reflected current job tasks. Ambient air monitoring data for 1996 agreed with the effluent calculations for public dose for unmonitored vent emissions (Section R8.1).

- Onsite waterborne effluent monitoring procedures were up to date and reflected current job tasks. However, the sampling procedure did not reflect a manufacturers recommendations for filter use (Section R8.2).

- The inspectors noted that only 40 out of 41 radiochemistry laboratory procedures met the required periodic review cycle, and in some cases the procedures did not accurately reflect current laboratory practices. One inspection followup item was identified regarding pending revision to the radiochemistry laboratory procedures (Section R8.3).

## Report Details

## I. Operations

O1 Conduct of Operations[1]

O1.1 High Enriched Uranium Refeeding Activities

a. Inspection Scope (Inspection Procedure (IP) 88100)

The inspectors independently reviewed refeeding activities involving an unauthorized enrichment in the purge cascade.

b. Observations and Findings

On April 7 cascade samples indicated that high enriched uranium (HEU) in excess of 20 percent enrichment existed in the purge cascade. Refeeding activities, which had been halted just prior to sampling, were suspended with a stop work order. Further engineering analysis determined that approximately 800 milligrams of uranium hexafluoride ($UF_6$) with a maximum assay of 20.7 per cent was in the purge cascade. The purge cascade removed light gases from the enrichment cascade and normally contained only trace amounts of $UF_6$ with enrichment levels less than 10 percent.

The inspectors interviewed the cascade controllers (CCs) and X-326 building operators and reviewed HEU refeed instructions and the log entries for the weekend. The HEU refeed instructions for the weekend were not followed by the cascade controllers nor by the operators. The refeed instructions were developed and approved by the cascade engineers to provide guidance to the operators but were never considered by the operators to require rigorous compliance. The instructions required one HEU cylinder to be placed on refeed on April 5 and the second cylinder on April 6. Heat lamps, used to increase the refeed rate, were to be applied to each cylinder after an initial two hour cold feed period.

On April 5 the CC neglected to instruct the operators to place the first HEU cylinder on refeed. The cascade engineer supervisor (CES) called the CC on the morning of April 6. During the discussion, the CES learned that the first cylinder was not on refeed. The CES authorized both HEU cylinders to be placed on refeed at the same time but to apply a heat lamp to only one

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[1] Topical headings such as 01, M8, etc., are used in accordance with the NRC standardized inspection report outline contained in NRC Manual Chapter 0610. Individual reports are not expected to address all outline topics, and the topical headings are therefore not always sequential.

cylinder. The cylinder scheduled to be placed on refeed on April 6 was already in service with a heat lamp applied at the time of the telephone call between the CES and the CC. The CC gave instructions to the operators to place the second cylinder originally scheduled for April 5 on refeed. The second cylinder was placed on refeed; and after the two hour cold feed period had been met, the operators placed a heat lamp on the second cylinder.

The high refeed rate caused by the application of heat lamps to both cylinders resulted in 800 milligrams of uranium greater than 20 percent assay in the purge cascade on April 7. The lack of rigor in following refeeding instructions and the placement of heat lamps on cylinders without the CC permission were identified by the facility as procedural inadequacies. Several procedures that were modified as a result of the event included requiring refeeding instructions to be rigorously followed and logged, instruction changes to be properly reviewed with no verbal changes allowed, and heat lamp application to cylinders requiring CC approval and log entries documenting that approval.

The procedure inadequacies were a violation of TSR 3.9.1, which required, in part, that written procedures shall be implemented to address plant activities. However, this self-identified and corrected violation is being treated as a Non-Cited Violation (NCV) consistent with Section VII.B.1 of the NRC Enforcement Policy.

c. Conclusion

The self-identified inadequacies regarding lack of rigor in complying with refeeding operations were further examples of problems in the conduct of operations. One NCV was identified.

O1.2 Potential Unreviewed Safety Question in X-344 Building Autoclaves

a. Inspection Scope (IP 88100)

The inspectors walked-down the safety systems associated with the X-344 building autoclaves.

b. Observations and Findings

On May 13 the inspectors reviewed the high condensate level system (HCLS) safety system actuations associated with the X-344 autoclaves. High water levels in the autoclaves would raise criticality safety and other safety concerns. The HLCS safety function was to detect water backed up in the drain line and secure the water source by shutting the steam supply valve. The inspectors noted that there was a screen at the top of the condensate drain line located in the bottom of the autoclave shell head.

On May 13 there was a HCLS actuation on Autoclave No. 1 in the X-344 building. During followup discussions regarding the actuation, a potential unreviewed safety question (USQ) was identified. The screen noted by the inspectors was located above the condensate level probe which was used to detect a high condensate level and actuate the safety system. The screen's location could potentially defeat the safety function of the condensate level probe by becoming clogged and having water accumulate above the probe without the probe sensing the high water level. The potential USQ was acknowledged by the facility staff. Operations were suspended in the X-344 building until the screens could be removed and a USQ determination was initiated. The inspectors will review the determination and consider this item an **Inspection Followup Item (IFI 70-7002/97003-01)**.

c. Conclusion

A potential USQ was identified by the inspectors regarding a screen located in a condensate drain line above an associated level probe. The screen could become clogged resulting in a high water level in the autoclave without a safety system actuation on high condensate level.

O1.3 Autoclave High Condensate Level System Safety Actuation

a. Inspection Scope (IP 88100)

The inspectors reviewed the circumstances surrounding HCLS safety system actuations for the autoclaves in the X-344 building.

b. Observations and Findings

On April 8 Autoclave No. 3 in the X-344 building had a safety system actuation due to an HCLS signal. An inspection of the autoclave revealed a partially clogged downstream strainer which caused a flow restriction sufficient to increase the condensate level in the drain line to actuate one of the level probes.

In determining the root cause of the safety system actuation, the facility staff determined the cleaning and inspection frequencies of the autoclave interior and drain lines were not sufficient. Another potential problem identified by the facility staff was that the autoclaves in the X-344 had a 1-inch drain line while similar autoclaves had 2-inch drain lines. Short term corrective actions was to clean the autoclaves and the strainers in X-342 and X-343 buildings In addition, a further evaluation of the 1 inch drain lines for drain capacity was part of the long term corrective action.

On May 13 Autoclave No. 1 in the X-344 building had a safety system actuation due to a HCLS signal. The investigation determined that the in-line strainer was clogged with rust particles. During the subsequent investigation, the potential USQ with the screens was discovered as

discussed in Section O1.2, and the screens above the level probes were removed from the X-344 autoclaves. The in-line strainer was cleaned again; the autoclave was tested several times, and the strainer was inspected for blockage. No blockage was noted, and the autoclave was returned to service on May 1[illegible]. On the first heat-up cycle, the autoclave again had a HCLS actuation. The autoclave was declared inoperable and taken out of service.

The repeated actuations of the HCLS were identified as a significant condition adverse to quality (SCAQ). The short term corrective actions from the April 8 event were not effective in precluding recurrence on May 13 and May 18. 10 CFR 76.93, "Quality Assurance," requires, in part, that a quality assurance program be executed. The Quality Assurance Plan (QAP) and American Society of Mechanical Engineers (ASME) NQA-1, 1989, required SCAQs be identified and corrective actions be developed to preclude recurrence of the SCAQs. Failure of the certificate holder to implement adequate corrective actions to preclude additional actuations is a **Violation of 10 CFR 76.93 (VIO 70-7002/97003-02).**

c. Conclusions

Repeated safety system actuations of the HCLS for the X-344 building autoclaves indicated that past corrective actions were ineffective. One violation was identified.

O1.4 Procedural Adherence Issues

a. Inspection Scope (IP 88100)

The inspectors reviewed problem reports that identified weaknesses in procedural compliances.

b. Observations and Findings

The inspectors reviewed the following events resulting from procedural adherence issues:

- After replacement of the 29-2-2 X-joint on April 12, operators introduced process gas into the header before it was leakrated at subatmospheric pressure with air as required by the safety analysis report (SAR) and plant procedures. A work instruction was prepared for the evolution but did not receive the required safety screening and approvals. The event resulted in no release of process gas. Facility staff appropriately identified the event and documented it on a problem report.

- On April 13 the back-shift CC placed stability in service for the first time in several months without authorization from operations management. The CC also made non-conservative interpretations of procedural requirements, which included independent verification that there were no flow restrictions in the cascade.

  An unsafe condition did not occur; however, operations management took appropriate action to isolate stability the following morning. As immediate corrective action, operations management stressed the importance of adhering to procedures and notifying management prior to performing unscheduled special evolutions. Operations staff were also revising the procedure to clarify the requirements for placing stability in service.

  Technical Safety Requirement 3.9.1 required, in part, that written procedures shall be implemented to address plant activities. The self-identified and corrected violations are being treated as two NCVs, consistent with Section VII.B.1 of the NRC Enforcement Policy.

c. Conclusion

The two events did not result in unsafe conditions, and plant management took appropriate action to stress the importance of procedural adherence. Two NCVs were identified.

O.8 Miscellaneous Operations Matters (90712)

O8.1 (Open) Event Report 97-01: Process gas leak detector (PGLD) actuation due to outgassing at the tails side withdrawal station (X-330 building). On March 20 a PGLD alarm was received in the X-330 building area control room (ACR) No. 2. The alarm indicated an outgassing at the tails side withdrawal compressor (30 WB-1) on the process floor. A second detector alarmed within three minutes of the first alarm, and the compressor was shut down. Investigation of the alarms indicated that an outgassing had occurred due to a valve bellows leak on the compressor discharge block valve. The valve buffer system failed to maintain a buffer pressure great enough to prevent process gas from leaking. A design improvement was identified with a scheduled completion date of December 31, 1997 (CER 70-7002/97003-03).

O8.2 (Closed) Event Report 97-02: On March 25 Autoclave No. 2 in the X-342 building had a HCLS actuation involving a steam supply shutdown. This event was discussed in Portsmouth Inspection Report 70-7002/97002(DNMS). Corrective actions were completed when the roll motor shaft was repacked to preclude any air loss. Due to the repetitive nature of the HCLS alarms, an NOV was identified in Section O1.3 (CER 70-7002/97003-04).

O8.3 (Closed) Event Report 97-03: An HCLS actuation in Autoclave No.3 in the X-342 building occurred on April 3, 1997. This event was discussed in Portsmouth Inspection Report No. 70-7002/97002. The failed steam trap was replaced during this report period. Due to the repetitive nature of the HCLS alarms an NOV was identified in Section O1.3 (CER 70-7002/97003-05).

O8.4 (Closed) Inspection Followup Item (IFI) 70-7002/97002-04: The IFI required the review of both Event Report 97-02 and 97-03 and the determination of the effectiveness of corrective actions to the HCLS actuations. This IFI is considered closed based on the review of the event reports and the NOV identified in Section O1.3.

O8.5 (Open) Event Report 97-04: An HCLS actuation in Autoclave No.3 in the X-344 building on April 8. This event is discussed in Section O1.3. Corrective actions were scheduled to be completed by July 14, 1997, (CER 70-7002/97003-06).

## II. Maintenance

M1 Conduct of Maintenance

M1.1 29-2-2 X-Joint Replacement

a. Inspection Scope (88102)

The inspectors observed activities associated with the removal of the 29-2-2 X-joint which contained a planned expeditious handling (PEH) deposit.

b. Observations and Findings

On April 11 the facility staff removed an X-joint (transition piping) containing a PEH deposit from the cell 29-2-2 bypass line. The inspectors observed that the plant operations review committee (PORC) review of the NCSA was comprehensive. The NCSA was unique in that it addressed a PEH deposit that was discovered adjacent to the PEH deposit in the X-joint. In addition, the inspectors observed portions of the X-joint removal, and noted good oversight from both maintenance and operations supervision.

However, the inspectors identified that facility staff exceeded the 8 hour limiting condition for operation (LCO) for TSR 2.2.3.15 by approximately 12 hours for restoring an air buffer to the PEH deposit adjacent to the X-joint. Facility staff believed a the 72 hour LCO for TSR 2.2.3.16 was appropriate for removal of the X-joint. Failure to restore the air buffer to the PEH deposit within the required 8 hours is a **Violation of TSR 2.2.3.15 (VIO 70-7002/97003-07)**.

The inspectors also noted that the work package did not address the LCO entry, and the plant shift superintendent (PSS) did not formally track the LCO. The inspectors learned that facility staff were developing a formal mechanism for LCO tracking. In the interim, Operations management directed the PSS to log the entry and exit of LCOs in the PSS log.

c. Conclusion

One violation was identified for failure to follow a TSR LCO action statement.

M1.2 Non-Destructive Assay Surveillances for Legacy Equipment

a. Inspection Scope (88103)

The inspectors reviewed the results of non-destructive assay (NDA) surveillances for cut-out cascade equipment that had been stored on the cascade floor.

b. Observations and Findings

Portsmouth Observation Report No. 70-7002/96-007 (DNMS) documented previous inspector concerns regarding nuclear criticality analysis for cut-out equipment stored on the cascade floor. In response, the facility staff initiated an NDA survey program for cut-out equipment which was stored on the cascade floor that had not been previously surveyed. The survey program was to determine if there was old equipment with uranium deposits great enough to require special nuclear criticality safety handling. Cut-out equipment has been in storage on the cascade floor since the 1960's.

On May 1 an old "29" sized converter was surveyed and results indicated a potentially large deposit. More accurate surveys were conducted on May 2 which indicated the deposit was approximately 226 pounds, which exceeded the minimum critical mass of 45 pounds for the approximate five percent assay of the deposit. The converter was cut-out in the 1970's and the openings on the converter were covered by steel plates tack welded in place, an acceptable past practice. An operations assessment team was activated to determine the safety significance of the deposit. It was noted that a nuclear criticality safety approval (NCSA) did not exist for the storage of the cut-out converter. Based on the steel cover plates, the facility staff determined that the worst case scenario for the deposit was low moderation due to wet air in-leakage. The minimum critical mass was re-calculated for low moderation conditions and determined to be approximately twice the mass of the uranium available in the deposit. The converter was then classified as a PEH component and an NCSA was developed for the converter. The facility staff modified the cover plates to establish a dry air buffer as required by TSR 2.2.3.16. The event was reported under Information Notice 91-01.

Technical Safety Requirement 3.11.2 requires, in part, that all operations involving uranium enriched to 1.0 wt% or higher U-235 and 15 grams (g) or more of U-235 shall be performed in accordance with a documented nuclear criticality safety approval (NCSA). Failure to have an NCSA for the cut-out converter is a **Violation of TSR 3.11.2 (VIO 70-7002/97003-08)**.

c. Conclusion

One violation was identified for failure to have an NCSA for equipment identified during a new surveillance program. The issue identified a weakness with regard to planned contingencies to handle the identified hazards.

## III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Emergency Lighting Deficiencies

a. Inspection Scope (88100)

The inspectors reviewed deficiencies identified with the emergency lighting systems in the plant.

b. Observations and Conclusions

On April 2 facility staff identified that the facility was not in compliance with TSR 3.23.g.3 for the X-705 building, which required illumination with battery backup for emergency egress. The deficiency was apparently identified several months ago, but no action was taken to correct it. During followup, the facility staff identified that the X-700 building was also without emergency lighting and portions of the X-330 building had failed battery discharge tests, and no repairs or compensatory actions were taken. To comply with the TSR requirement, the facility staff were provided with flashlights in the affected areas.

The inspectors reviewed Procedure XP2-SS-FS1055, "Inspection And Testing Of Emergency Egress Lighting," and noted that it was not clear as to whether adequate battery discharge testing was performed on the battery units while under the lighting loads without the battery chargers in service. The inspectors determined that the facility staff tested the lighting with the battery chargers in service. However, the facility staff concluded that there were no immediate operability concerns in the short term as the battery chargers were not capable of carrying the entire load. Therefore, an electrical fault in the batteries would be detected during the discharge testing. Subsequently, the facility staff elected to revise the procedure to test the batteries with the battery chargers disconnected.

In response to the inspectors' concerns, the facility staff identified some additional discrepancies. Some emergency lighting in the X-326 building was declared inoperable because the batteries had been removed when the cascade cells in that area were shut down several years ago. In addition, the facility staff discovered there was no battery backup for the lighting in the X-710 building.

Failure to provide emergency lighting in process areas is a violation of TSR 3.23.g.3; however, the facility staff identified and corrected the deficiencies. Therefore, this issue is being treated as a NCV, consistent with Section VII.B.1 of the NRC Enforcement Policy.

c. Conclusion

Identification and corrective actions for the emergency lighting deficiencies were eventually performed. Redundant power supplies were provided and back-up diesel generators were available in most cases.

E2.2 Design and Use of Liquid Cylinder Handling H-Frame Lifting Devices

a. Inspection Scope (IP 88101)

The inspectors reviewed the design and use of the H-Frames used in the lifting of liquid $UF_6$ cylinders.

b. Observations and Findings

During the inspection period, the inspectors noted that several H-Frame lifting fixtures used by the liquid $UF_6$ cylinder handling cranes had been switched between the various facilities which handle the liquid $UF_6$ cylinders. The H-Frames had facility numbers painted on them indicating that they were assigned to that particular facility. The inspectors reviewed the stamped rated load on the H-Frames and associated drawings that indicated that all the H-Frames were designed to handle the heaviest $UF_6$ cylinders with the TSR required design feature of a 5:1 weight safety margin. There were also no restrictions in the TSR nor SAR for using the H-Frames in a different facility. However, when the inspectors requested the calculations demonstrating the 5:1 weight safety margin, some calculations were not available. Calculations were available for newer H-Frames but not for some older H-frames. The newer H-Frames had been designed based on the specifications of the old H-Frames. The inspectors' review of additional H-Frame calculations is considered an **Inspection Followup Item (IFI 70-7002/97003-09)**.

c. Conclusion

H-Frames were designed to handle 2½, 10, and 14 ton $UF_6$ cylinders and could be inter-changed between facilities. While the design calculations for the older H-Frames were not available for review, the newer H-Frame calculations provided a basis for the 5:1 weight safety margin in the TSRs. One inspection followup item was identified regarding further inspector review of calculations for older H-Frames.

## IV. Plant Support

F8. Miscellaneous Fire Protection Issues (97012)

F8.1 (Open) Event Report 97-05: Facility staff identified, during a self-assessment of the fire protection surveillance program, that the TSR action statement was not entered as required during scheduled supervisory alarm testing. The testing, required by TSR Surveillance Requirement (SR) 2.2.3.1.7, was conducted to verify that the alarms activated when the post indicator valves were closed. Facility staff identified 57 alarms which were malfunctioning and had not been declared inoperable. As an immediate compensatory action, all hot work (welding) was stopped in the affected areas until repairs on the alarms were completed. Facility staff identified the problems as followup to the inspectors' previous concerns and discussed in the previous inspection report with regard to weaknesses in the staff's poor implementation of the TSR surveillance program. Facility identified corrective actions were scheduled for completion by July 30, 1997 (CER 70-7002/97003-10).

T1. Conduct of Transportation Activities

T1.1 Handling and Transportation of $UF_6$ Filled Cylinders

a. Inspection Scope (88100)

The inspectors reviewed issues associated with the facility staff's handling and transportation of $UF_6$ filled cylinders.

b. Observations and Findings

On April 9 Paducah Gaseous Diffusion Plant (PGDP) engineering staff identified that the current plant practice for the tinning of new and replacement $UF_6$ cylinder valves was not consistent with American National Standards Institute (ANSI) Standard N14.1, "Uranium Hexafluoride Packaging for Transport." Specifically, ANSI N14.1-1990 required the use of ASTM B32, 50A solder for cylinder valve tinning. However, plant practice was to use a mixture of this and another solder for the process. The PGDP staff also noted that the NRC approved transportation quality assurance program, the NRC Certificate of Compliance (CofC) for Radioactive Materials Packages, and 10 CFR 71.5 required conformance with ANSI N14.1 (see PGDP Inspection Report No. 70-7001/97002(DNMS).

Portsmouth primarily received cylinder valves and plugs from PGDP already tinned, and it was recognized that the same issue existed at Portsmouth. The facility staff was informed by PGDP of the potential safety issue and non-compliance with the CofC. According to the PGDP plant shift supervisor (PSS) logs, PGDP stopped shipment of cylinders that evening and notified the Portsmouth PSS office around midnight. In addition, the PGDP regulatory affairs manager notified the Portsmouth regulatory affairs manager of the issue at about 11:00 p.m., on April 9.

The inspectors reviewed the issue the morning of April 10, after noting a problem report from PGDP regarding the tinning mixture on the valves and plugs. The PGDP stop work order only dealt with cylinders that originated at the PGDP. The inspectors recognized that the valves used at Portsmouth were tinned at the PGDP and if any customer cylinders had been rejected due to bad valves or plugs, the valves and plugs would have been replaced from the PGDP stock. About 1:30 p.m. on April 10 a second notification was received in the Portsmouth PSS office from the PGDP to ensure that the PGDP cylinders at Portsmouth, ready to be returned to the PGDP, were placed on a stop work order. During the second notification from the PGDP, the significance of the issue was recognized by the facility staff, and a team was assembled to review the issue. The team independently identified the problem with replacing bad customer valves or plugs with the PGDP valves and plugs, and a stop work order was issued to prevent shipment of any cylinders with the PGDP valves or plugs.

The inspectors asked if there had been any shipments made earlier that day. The facility identified one shipment left the site at 9:30 a.m., and two of the cylinders had PGDP tinned valves. That shipment left Portsmouth 20 hours after the issue was identified at the PGDP and almost 12 hours after Portsmouth management was notified of the PGDP stop work order.

10 CFR 71 requires, in part, that shipments of licensed material be made in accordance with applicable NRC and DOT regulations. The NRC CofC for the shipment of licensed materials requires, in part, that cylinder valves and plugs are to be tinned in conformance with ANSI N14.1-1990. The failure to tin cylinder valves and plugs with the proper solder on cylinders offered for shipment is a **Violation of 10 CFR 70 (VIO 70-7002/97003-11).**

c. Conclusions

Untimely pursuit of a potential safety issue resulted in one violation. Facility personnel, including senior management, was notified on two occasions regarding the valve and plug tinning issues prior to the shipment which provided opportunities to recognize the non-conformance with the CofC.

## R8 Environmental Protection

### R8.1 Airborne Emissions

a. Inspection Scope (88045)

The inspectors walked down the X-333 building cold recovery and wet air evacuation systems and observed the changeout of several alumina trap filters in the X-326 building. The inspectors also reviewed data from the network of onsite and offsite air monitors.

b. Observations and Findings

Cold recovery systems were used to evacuate process gases from cascade cells which must be opened for maintenance. Wet air evacuation systems were used to evacuate cells prior to returning cells to service. The inspectors verified that the procedures used by the operators were adequate and reflected current plant practices. Specifically, every four hours grab samples were being taken to ensure the accuracy of the continuous monitors from the cold recovery and wet air evacuation systems. Operator logs reflected these samples were being taken and that continuous monitors were within the required accuracy.

The inspectors also observed the weekly change out of alumina trap filters for three seal exhaust monitoring stations in the X-326 building and walked down monitoring systems for the X-326 building purge vents. Records reviewed indicated that the chemical technicians changed out alumina trap filters weekly for all 13 continuous monitors. Procedures used by the chemical technicians were reviewed and approved as required in Procedure XP2-PS-PS1035, Rev. 0 "Procedure Periodic Review." The inspectors noted that technicians used the required personal protective equipment for the job tasks being performed and that current job task practices were reflected adequately in the appropriate procedures.

The removed alumina trap filters were processed under a chain of custody procedure and subsequently analyzed by the radiochemistry laboratory. Results of the analysis were provided to the environmental safety and health (ES&H) group, which tracked airborne emissions from the 13 monitored vents.

Technical Safety Requirement 3.16 states, in part, that an environmental protection program shall be implemented as described in safety analysis report (SAR) Section 5.1. Portsmouth SAR, Section 5.1.2 "Environmental Monitoring Description," stated in part, that all process vents which have the potential to emit radionuclides that could result in a 0.1 mrem/year or greater dose to the most exposed member of the public to be continuously monitored. Facility staff identified 104 unmonitored vent points which have the potential to emit radioactive effluents (uranium, technetium-99). The

facility staff used the United States Environmental Protection Agency (EPA) CAP-88 computer program to analyze the unmonitored vent emissions. The estimated dose for the most exposed member of the public was less than 0.1 mrem/yr.

The facility staff also provided data from a network of onsite and offsite permanent continuous ambient air monitors which supported the calculations of annual dose to the most exposed member of the public. Results from 1996 ambient air monitoring indicated that dose levels were below 0.1 mrem/year at the monitoring points.

c. Conclusions

Plant procedures for air monitoring were adequate and reflected current job tasks. Ambient air monitoring data for 1996 agreed with the radioactive effluent calculations for public dose from unmonitored vent emissions.

R8.2 Waterborne Effluents

a. Inspection Scope (88045)

The inspectors walked down eight water outfalls, observed weekly sampling at four water outfalls, reviewed associated sampling procedures and interviewed environmental compliance staff.

b. Observations and Findings

The inspectors observed an environmental compliance technician obtaining weekly water samples required by Procedure XP4-EW-EV7502, "Collection of Environmental Water Samples." Once taken, the water samples were processed under a chain of custody procedure and delivered to the chain of custody office in the X-710 laboratory, where radiochemistry personnel picked up the water samples for analyses. The inspectors determined, through record reviews, that the results of environmental water samples were less than the 10 CFR 20.1301 dose limits to members of the public.

The inspectors observed that during grab sampling from an elevated spigot, located in the X-6619 building, purge water released before and after sample collection was allowed to drain to a sump on the floor. Splashing occurred during sampling and if radioactive contamination was present in the waste stream, a potential existed for contamination. Facility staff stated that samples taken from this area were post sewage treatment samples and should contain no contamination. The inspectors reviewed the grab sample analyses which indicated no contamination above background was present.

While observing grab sampling using a peristaltic pump and 0.45 micron filter cartridge at the X-616 liquid effluent control facility, the inspectors noted a discrepancy between vendor's recommendations for filter

use and facility written procedures. The vendor's recommendation stated that 500 milliLiters (mL) of sample fluid should be passed through the filter (purged) before collecting the first sample. Section 8.16.2 of Procedure XP4-EW-EV7502 specified only 100 mL must be passed through the filter prior to taking the first sample. Facility staff were unaware of the vendor's recommendations for filter use and agreed to review the vendor's recommendation

c. Conclusions

The technician performing waterborne effluent sampling was knowledgeable and adhered to facility procedures while taking samples. ES&H staff indicated the vendor's recommendations for filter use would be evaluated.

R8.3 Radiochemistry Laboratory

a. Inspection Scope (88045)

The inspectors observed preparation of vent samples from seal exhaust stations, and discussed radiochemistry operations with laboratory staff.

b. Observations

The radiochemistry laboratory, located in X-710 building, performed the radiochemical analyses for all plant environmental samples. The inspectors observed laboratory staff using Procedure TSD-553-359, "Analysis of Alumina Traps from Continuous Vent Monitors." The inspectors noted that section 8.2.3 required the laboratory staff to analyze a standard and two sample spikes with each batch of samples. The procedure, as written, did not specify how the spikes were to be prepared and laboratory staff were not aware of the procedure which addressed the preparation of sample spikes.

The inspectors also noted several procedure control problems. The inspectors observed that Procedure TSD-553-359 was last revised in 1993 and the associated laboratory bench date sheets were last revised in 1996. Similar discrepancies between other bench data sheets and procedure revisions were noted. In addition, the inspectors noted that 40 out of 41 procedures were not reviewed on a periodic frequency as required by Procedure XP-2-PS-PS1035, Rev. 0 "Periodic Procedure Review." Compliance Plan Issue 30, "Procedures Program," stated, in part, that analytical laboratory procedures shall be updated to current requirements by December 31, 1997. Completion of procedural revisions for the radiochemistry laboratory will be reviewed during a subsequent inspection and is considered an **Inspection Followup Item (IFI 070-07002/97003-12)**.

The inspectors noted that the laboratory participated in external quality control (QC) programs for radiological analyses, including the U.S. EPA intercomparison radionuclide control program and the Department of Energy (DOE) environmental measurements laboratory program, to ensure that environmental sampling onsite was performed accurately.

c. Conclusions

The inspectors noted that 40 out of 41 radiochemistry laboratory procedures did not meet the required periodic review cycle, and in two cases procedures did not accurately reflect current laboratory practices.

## V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the facility management on May 19, 1997. The facility staff acknowledged the findings presented.

## PARTIAL LIST OF PERSONS CONTACTED

Lockheed Martin Utility Services (LMUS)

*D. I. Allen, General Manager
*J. B. Morgan, Enrichment Plant Manager
*M. Hasty, Engineering Manager
*R. W. Gaston, Nuclear Regulatory Affairs Manager
*C. W. Sheward, Maintenance Manager
*R. D. McDermott, Operations Manager

United States Enrichment Corporation

J. H. Miller, USEC Vice President, Production
*L. Fink, Safety, Safeguards & Quality Manager

United States Department of Energy (DOE)

J. C. Orrision, Site Safety Representative

Nuclear Regulatory Commission (NRC)

G. L. Shear, Acting Deputy, Division of Nuclear Material Safety
*C. R. Cox, Senior Resident Inspector
*D. J. Hartland, Resident Inspector
Y. H. Faraz, Project Manager, NMSS

*Denotes those present at the exit meeting on May 19, 1997.

## INSPECTION PROCEDURES USED

| | |
|---|---|
| IP 88100 | Plant Operations |
| IP 88101 | Configuration Control |
| IP 88102 | Surveillance Observations |
| IP 88103 | Maintenance Observations |
| IP 88105 | Management Oversight and Controls |
| IP 88020 | Regional Criticality Safety |
| IP 88045 | Environmental Protection |
| IP 97012 | Inoffice Reviews of Written Reports on Nonroutine Events |

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---|---|---|
| 70-7002/97003-01 | IFI | Review of the USDQ for the X-344 building autoclave screens. |
| 70-7002/97003-02 | VIO | Inadequate corrective actions for the autoclave HCLS actuations. |
| 70-7002/97003-03 | CER | PGLD safety system actuation. |
| 70-7002/97003-06 | CER | HCLS safety system actuation in X-344 building autoclave No. 3. |
| 70-7002/97003-07 | VIO | Failure to follow a TSR LCO for PEH deposits. |
| 70-7002/97003-08 | VIO | Failure to follow the TSR requirements for NCS program. |
| 70-7002/97003-09 | IFI | Review of the design calculations for H-Frames. |
| 70-7002/97003-10 | CER | Inoperable High Pressure Fire Water system. |
| 70-7002/97003-11 | VIO | Failure to follow a transportation CofC. |
| 70-7002/97003-12 | IFI | Review pending chemistry lab procedure revisions. |

Closed

| | | |
|---|---|---|
| 70-7002/97002-04 | IFI | Review two event reports and Compliance Plan effectiveness for autoclave HCLS alarms. |
| 70-7002/97003-04 | CER | Autoclave HCLS safety system actuation. |
| 70-7002/97003-05 | CER | Autoclave HCLS safety system actuation. |

Discussed

None

Certification Issues - Closed

None

## LIST OF ACRONYMS USED

| | |
|---|---|
| ACR | Area Control Room |
| ANSI | American National Standards Institute |
| ASME | American Society of Mechanical Engineers |
| CC | Cascade Controller |
| CER | Certificate Event Report |
| CES | Cascade Engineering Supervisor |
| CFR | Code of Federal Regulations |
| CofC | Certificate of Compliance |
| EPA | Environmental Protection Agency |
| ES&H | Environmental Safety and Health |
| g | Gram |
| HCLS | High Condensate Level System |
| HEU | High Enriched Uranium |
| IFI | Inspection Followup Item |
| IP | Inspection Procedure |
| LCO | Limiting Condition for Operation |
| LMUS | Lockheed Martin Utility Services |
| mL | milliLiter |
| mrem | milli-roentgens equivalent man |
| N2 | Nitrogen |
| NCS | Nuclear Criticality Safety |
| NCSA | Nuclear Criticality Safety Approval |
| NCV | Non-cited Violation |
| NDA | Non-destructive Assay |
| NOV | Notice of Violation |
| NRA | Nuclear Regulatory Assurance |
| NRC | Nuclear Regulatory Commission |
| PDR | Public Document Room |
| PEH | Planned Expeditious Handling |
| PGDP | Paducah Gaseous Diffusion Plant |
| PGLD | Process Gas Leak Detector |
| PORC | Plant Operations Review Committee |
| psia | pounds per square inch absolute |
| PSS | Plant Shift Superintendent |
| QAP | Quality Assurance Plan |
| QC | Quality Control |
| SAR | Safety Analysis Report |
| SCAQ | Significant Condition Adverse to Quality |
| SR | Surveillance Requirement |
| TSR | Technical Safety Requirement |
| $UF_6$ | Uranium Hexafluoride |
| USQ | Unreviewed Safety Question |
| VIO | Violation |
| wt% | weight-percent |