

February 28, 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 07007002/2001-002(DNMS)
AND NOTICE OF VIOLATION

Dear Mr. Brown:

On February 12, 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 is described in detail in the enclosed report. The violation is of concern because we continue to identify problems regarding adherence to plant procedures that, in some cases, should have been raised by your staff. Our recent performance review and discussions with your staff on January 23, 2001, highlighted the need for improvement in adherence to plant procedures.

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 this 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. However, you are requested to respond to us in writing within 30 days describing the generic actions that your staff is taking to address the continuing problems with procedural adherence.

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/

Patrick L. Hiland, Chief
Fuel Cycle Branch

Docket No. 07007002
Certificate No. GDP-2

- Enclosures:
1. Inspection Report 07007002/2001-002(DNMS)
 2. Notice of Violation

- cc w/encls:
- P. D. Musser, Portsmouth General Manager
 - P. J. Miner, Manager, Regulatory Affairs/Commitment Management, 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 December 30, 2000, through February 12, 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 3.9.1 requires, in part, that written procedures shall be prepared, reviewed, approved, and implemented for activities described in Appendix A to Safety Analysis Report (SAR) Section 6.11.

Appendix A of SAR Section 6.11 describes operations, control room activities, work control, and testing of cranes as activities for which procedures shall be implemented.

In addition:

- A. Step 6.4.2.4 of Procedure XP2-US-FO11606, "COP-07 Operating Area Logs," requires that all out-of-tolerance readings and their causes, if known, shall be recorded in the narrative section of the round sheets or in designated logs. In addition, equipment deficiencies should be identified in the work control process or the problem reporting process for correction.
- B. Step 6.1.5 of Procedure XP2-US-FO1102, "COP-02 Shift Routines," requires that as soon as practical after assuming shift duties, the Plant Shift Superintendent (PSS) shall hold a shift briefing.
- C. Step 6.5.7 of Procedure XP2-GP-GP1030, "Work Control Process," requires that the planner complete the Form A-5087 planning checklist.
- D. Step 8.1.14 of Procedure XP3-GP-GP1071, "Operating the Overhead Bridge Crane From The Cab," requires that if the crane was operating correctly during required pre-inspection, that it be documented on the applicable sections of the A-5503 inspection form.

Contrary to the above:

- A. From January 25, 2001 to February 7, 2001, operations staff in Building X-533 failed to record the out-of-tolerance readings for breaker bus air pressure on round sheets and failed to use the work control process or the problem reporting process for correction.
- B. On February 8, 2001, the PSS did not hold a shift briefing in Area Control Room Number 4 of Building X-326 after assuming shift duties.
- C. On February 8, 2001, the inspectors identified that the planner had not completed the Form A-5087 planning checklist for Work Package 0030433-01, preventative maintenance on the Building X-102 radiation alarms.
- D. On February 6, 2001, plant staff failed to complete the A-5503 inspection form prior to using a crane in Building X-333.

This is a Severity Level IV violation (Supplement VI). **(VIO 70-7002/2001002-01)**

The NRC has concluded that information regarding the reasons for Violation 70-7002/2001002-01, 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 this Inspection Report. Therefore, a specific response to Violation 70-7002/2001002-01 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 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 28th day of February 2001

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 07007002
Certificate No: GDP-2

Report No: 07007002/2001-002(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: December 30, 2000, through February 12, 2001

Inspectors: David J. Hartland, Senior Resident Inspector
Stephen R. Caudill, Resident Inspector
Monte P. Phillips, Senior Fuel Cycle Inspector
David E. Roth, Fuel Cycle 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 07007002/2001-002(DNMS)

Operations

The inspectors concluded that the Plant Shift Superintendent (PSS) did not adequately document the basis for maintaining the fire water system operable when a problem with the tank level gauges was discovered. In response, plant staff prepared an engineering evaluation that concluded the tank and the auto-start feature on the pumps were not required for system operability. Plant staff were evaluating the adequacy of existing guidance in plant procedures and a change to the Technical Safety Requirements (TSRs) to remove the surveillance requirements for those features. (Section O1.1)

The inspectors identified an issue regarding obsolete signs in plant facilities and an unresolved item regarding the applicability of normal lighting to the TSR for worker protection. In addition, the inspectors identified procedure violations for failure to perform a shift briefing after assuming shift duties in Building X-326 and failure to initiate action to correct out-of-tolerances during performance of TSR surveillances in the Building X-533 switchyard. (Section O1.2)

Maintenance

The inspectors concluded that maintenance was generally being performed in accordance with certificate requirements. However, the inspectors identified multiple examples of failure to follow maintenance procedures due to apparent inattention to detail. (Section M1.1)

Engineering

Design requirements for autoclave cold trap modifications inspected were clearly specified in engineering job field instructions and associated drawings. Calculations had been made to determine critical parameters affecting the modifications. Some deficiencies were noted involving the lack of justification to support some inputs to calculations, inattention to detail, and the methodology for modifying drawings during the design process. (Section E1.1)

Plant Support

The inspectors concluded that workers generally practiced appropriate controls to reduce the spread of radioactive contamination. However, some workers failed to follow the recommended guidance for removal of contaminated clothing. The consequences were minimal, however, as the poor practices did not result in contamination of the workers. (Section P1.1)

Report Details

I. Operations

O1 Conduct of Operations

O1.1 Fire Water System Technical Safety Requirements Implementation

a. Inspection Scope (88100)

The inspectors observed plant operations to ensure that the activities were performed in accordance with certificate requirements.

b. Observations and Findings

On January 24, during a review of Problem Report (PR) No. PTS-01-00440, the inspectors noted that a problem with the level gauges for the X-640-2 fire water storage tank had occurred the previous day. The gauges, which were located in Buildings X-300 and X-640 and locally at the tank, were apparently reading above 100 percent because the common instrument line had become frozen. On the PR, the PSS documented that the tank was declared inoperable; however, no Technical Safety Requirement (TSR) action statements were entered, and the basis for not doing so was not documented on the PR.

During followup discussion with the PSS, the inspectors learned that the level gauges, not the tank, were, in fact, declared inoperable. The inspectors noted that Surveillance Requirements 2.2.3.4.2 and 2.7.3.3.2 required that the tank level be monitored monthly to ensure that it was filled to at least 90 percent capacity and that plant staff use the gauges to verify that requirement. The inspectors queried the PSS regarding the basis for assuring that compliance with the surveillance requirement was being maintained as it was not documented in the problem report. The PSS responded that the jockey pump automatically started on low tank level to maintain the required level in the tank.

During followup discussions, plant staff indicated that even if the tank level surveillance requirements were not met, entry into a TSR action statement was not required as long as the minimum flow requirements of TSRs 2.2.3.4 and 2.7.3.3 were maintained. Plant staff stated that compliance with the TSRs was maintained by having at least four of the six fire water pumps available to provide the minimum flow requirements. In addition, plant staff also credited the ability to manually start the pumps locally or from Building X-300 if the automatic start feature of the pumps was not available. The system was designed so that the pumps would sequentially auto-start as level in the tank decreased to make-up the inventory in the tank.

Plant staff documented the above requirements for maintaining the fire water system operable and in compliance with the TSRs in an engineering evaluation and evaluated the adequacy of existing guidance in plant procedures. At the end of the inspection period, the plant staff was evaluating a change to the TSRs eliminating the surveillance requirement for maintaining fire water tank inventory and the automatic start of the fire pumps.

c. Conclusions

The inspectors concluded that the PSS did not adequately document the basis for maintaining the fire water system operable when a problem with the tank level gauges was discovered. In response, plant staff concluded and documented in an engineering evaluation that the tank and the auto-start feature on the pumps were not required for system operability. Plant staff was evaluating the adequacy of existing guidance in plant procedures and a change to the TSRs to remove the surveillance requirements for those features.

O1.2 Procedure Compliance Deficiencies

a. Inspection Scope (88100)

The inspectors observed workers performing specific tasks to determine if operations were being conducted safely and in accordance with approved written procedures and other certificate requirements. The inspectors evaluated the operators' awareness of the safety aspects of the operations, and the operators' understanding and use of the written procedures applicable to operations being performed.

b. Observations and Findings

Signs

The inspectors noted many obsolete signs on doors in plant facilities. These signs stated building access requirements, door sealing requirements, etc. Discussions with plant staff indicated that many of the signs were no longer applicable. The inspectors were concerned that the presence of obsolete signs could cause workers to ignore relevant signs, and that the obsolete signs would lead to confusion about what the real requirements were. Plant staff documented the issue in PR-PTS-01-00730, and work control scheduled unwarranted and obsolete sign removal.

Operator Round Sheets

The inspectors reviewed the round sheets used to document performance of TSR surveillances in the Building X-533 switchyard for the period between January 25 and February 7. The sheets were used to record values for breaker bus air pressures and bus voltages. The inspectors noted that each sheet had multiple pressure readings that were below the listed minimum of 220 psig, but above the minimum for TSR 2.2.3.14 (195 psig). The operators had circled the readings but had not initiated any corrective action as required by the instructions on the round sheets. The inspectors noted that the rounds sheets had been completed by at least two different operators and had been reviewed by at least two different front line managers, yet none had followed instructions on the sheets for the out-of-tolerance conditions.

Operations management documented the issue in PR-PTS-01-00715 and, as corrective action, issued a "lessons learned" to remind the operators of the requirements. In addition, the inspectors noted that, on the following day, operations staff initiated PR-PTS-01-00718 to document low bus pressures and prepared Work Request 0101723 to adjust regulators to above 220 psig.

Technical Safety Requirement 3.9.1 requires, in part, that written procedures shall be prepared, reviewed, approved, and implemented for activities described in Appendix A to Safety Analysis Report (SAR) Section 6.11. Appendix A of SAR Section 6.11 describes operations as activities for which procedures shall be implemented. In addition, Step 6.4.2.4 of Procedure XP2-US-FO11606, "COP-07 Operating Area Logs," requires that all out-of-tolerance readings and their causes, if known, shall be recorded in the narrative section of the round sheets or in designated logs. In addition, equipment deficiencies should be identified in the work control process or the problem reporting process for correction. Contrary to the above, from January 25 to February 7, operations staff failed to record the out-of-tolerance readings on the round sheets and failed to use the work control process or the problem reporting process for correction. This is a **violation. (70-7002/2001002-01a).**

Turnover

On the morning of February 8, 2001, the inspectors observed the shift turnover in Area Control Room (ACR) Number (No.) 4 in Building X-326. The inspectors noted the on-coming shift did not hold a shift briefing following the turnover. Individual operators exchanged their applicable rounds sheets and eventually commenced taking their rounds in the field. Two operators in the ACR received an individual briefing via telephone from the first line manager in ACR No. 6.

The inspectors discussed with the operators how shift briefings were performed. The operators stated that normally no formal brief was held, but that operators with unusual or abnormal tasks were briefed by telephone. The inspectors asked if a speaker phone was available, and the operators stated that one had been installed about two weeks before the inspection, but that it was not normally used. Discussions with the front line manager confirmed that a formal shift briefing was not normally held. The inspectors noted that Procedure XP2-US-FO1102, "COP-02 Shift Routines," requires the shift superintendent to hold a shift briefing.

During followup review, the inspectors identified errors in the procedure. For example, Step 6.2.4 stated that the "off-going" operator signed the logs to accept responsibility instead of the "oncoming" operator. The inspectors considered the failure to perform a shift briefing and the errors in the procedure to be a lack of rigor in preparing and implementing the requirements. Plant staff documented the issues in PR-PTS-01-00705. Immediate corrective actions included revising Procedure XP2-US-F01102, and preparing a daily operating instruction to ensure that the requirements were subsequently implemented.

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 to SAR Section 6.11. Appendix A of SAR Section 6.11 described control room activities as activities for which procedures shall be implemented. Step 6.1.5 of Procedure XP2-US-FO1102, "COP-02 Shift Routines," requires that as soon as practical after assuming shift duties, the shift superintendent shall hold a shift briefing. Contrary to the above, on February 8, the shift superintendent did not hold a shift briefing in ACR No. 4 in Building X-326 after assuming shift duties. This is a **violation. (70-7002/2001002-01b)**

Lighting

During the routine observance of operations in Building X-326, the inspectors noted that at least one stairway and one hallway had no functioning lights. The inspectors were concerned that the lack of illumination could impede the evacuation of personnel from the building in the event of an emergency. The inspectors discussed the poor lighting with several operators and found that the operators had previously raised the issues with building management but were not aware if a work request was generated.

Plant staff documented the issue in PR-PTS-01-00706. The problem report documented that the issue had been raised at the most recent area safety committee meeting, but corrective action had not yet been taken. In response, an activity was initiated to re-lamp the stairwell, and plant staff performed a lighting survey of other facilities to identify areas that did not have adequate lighting. Some additional deficiencies were identified in Buildings X-710 and X-333 and appropriate compensatory actions were initiated.

The inspectors noted that the problem report was marked as having no TSR or other regulatory impact, and was not flagged as an industrial safety concern. However, the inspectors noted that worker protection from uranium hexafluoride (UF6) process hazards was described in TSR 3.23. The TSR stated, "Worker protection measure shall be established, implemented, and maintained . . . Such measures shall address the following elements: g.(3) Providing illumination in process areas with battery backup for emergency egress. Where illumination with battery backup is not functional, not available, or not feasible, personnel shall be provided with functional portable lights." The inspectors noted that plant staff performed periodic surveillances of lighting powered by battery backup to ensure that those systems were available for emergency egress but did not have a formal program for maintaining normal lighting. The inspectors review of the applicability of normal lighting to TSR 3.26 and the adequacy of plant staff's controls for maintaining the lighting is an **unresolved item.**
(70-7002/2001002-02)

c. Conclusions

The inspectors identified an issue regarding obsolete signs in plant facilities and an unresolved item regarding the applicability of normal lighting to the TSR for worker protection. In addition, the inspectors identified procedure violations for failure to perform a shift briefing after assuming shift duties in Building X-326 and failure to initiate action to correct out-of-tolerances during performance of TSR surveillances in the Building X-533 switchyard.

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>
37640	12/30/00	Open	Safety System Actuation, three Building X-326 Cascade Automatic Data Processing smokeheads located above the Extended Range Product Station actuated.

O8.2 Bulletin 91-01 Reports (97012)

The certificatee made the following report pursuant to Bulletin 91-01 during the inspection period. The inspectors reviewed any immediate Nuclear Criticality Safety (NCS) concerns associated with the report at the time of the initial verbal notification. Any significant issues emerging from the review are discussed in separate sections of this report or in future inspection reports.

<u>Number</u>	<u>Date</u>	<u>Title</u>
37656	1/08/01	24-Hour Report - NCS violation; discrepancy in Building X-710 Uranium-235 mass inventory logs.

O8.3 (Closed) VIO 70-7002/2000006-01D: Failure to identify and correct, through a significant condition adverse to quality corrective action plan, that shutdown cascade cells maintained at subatmospheric pressure and containing less than safe uranium mass were not at a UF₆ negative as required by the applicable Nuclear Criticality Safety Analyses (NCSAs). Plant staff determined that the cause of the violation was that operations only considered shutdown cells with greater than safe mass deposits but not cells which had that potential if a fluorinating environment was lost when developing corrective actions to a previous violation. As corrective action, plant staff revised applicable operating procedures to require testing for a UF₆ negative when cells were shut down and maintained at subatmospheric conditions. The inspectors had no further issues and this item is closed.

II. Maintenance

M1 Conduct of Maintenance Activities

M1.1 Procedure Compliance Deficiencies

a. Inspection Scope (88025)

The inspectors determined whether general maintenance operations, surveillance tests, and calibrations were being conducted in accordance with certificate requirements and approved procedures, and determined specifically whether emergency utility services and process monitoring instrumentation was being maintained and calibrated as required.

The inspectors reviewed a sampling of surveillance tests required by the certificate for systems important to safety. The data-sheets were reviewed to determine if the required test frequencies were met, if the results were acceptable, if corrective action was assigned for inadequate equipment performance, etc..

b. Observations and Findings

Maintenance activities observed by the inspectors included:

Work Package or Activity ID	Task Description	Safety Class
0030433-01 X-102 PM CAAS	Perform PM on Radiation Cluster Slaves per XP2-GP-IM6030	AQ
0103285-01 X343-2 Cal 05 Loop	Calibrate 05 loop on AC#2, indicates 11.6 psi at atmosphere	Q
003132701 AQ Replace LAW A/B compressor	LAW A/B compressor replacement per XP4-OM-MM4109	AQ

Radiation Alarm Maintenance (0030433-01)

The inspectors reviewed the field work and the work package for the preventive maintenance on the radiation alarms in Building X-102. The inspectors noted that a maintenance manager was also overseeing the work. Discussions with the manager indicated that the manager was appropriately spot-checking the performance of work. However, the inspectors noted two issues that had not been detected by the manager.

First, the inspectors observed a weakness in the lack of rigor in preparing and implementing the worker safety requirements. The personal protective equipment checklist in the work package indicated that maintenance staff was required to wear safety glasses/side shields. The inspectors showed this to the workers, none of whom had side shields, and found that the workers thought that only safety glasses were required. Subsequently, the workers donned side shields. The inspectors noted that the workers had signed the safety and health work permit in the work package that showed that personal protective equipment was required. The inspectors also noted that contamination was listed as a radiological hazard, although no special precautions against contamination were required for the work in the building.

Second, the planning checklist for the work was not filled out. Again, the workers were unaware of this. Subsequently, the checklist was filled out and a remark entered that it was completed "after the fact." The manager performing the oversight documented the issues with the checklist in PR-PTS-01-00732. The problem report incorrectly stated that the action steps of the procedure do not direct the planner to complete the form. The inspectors noted that step 6.5.7 of Procedure XP2-GP-GP1030, "Work Control Process," stated that the planner shall complete Form A-5087 planning checklist. The inspectors discussed the incorrect information in the problem report with the manager, and the manager agreed that the checklist was required.

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 to SAR Section 6.11. Appendix A of SAR Section 6.11 describes work control as an

activity for which procedures shall be implemented. In addition, Step 6.5.7 of Procedure XP2-GP-GP1030, "Work Control Process," requires that the planner shall complete the Form A-5087 planning checklist. On February 8, the inspectors identified that the planner had not completed the planning checklist for the work package. This is a **violation. (70-7002/2001002-01c)**

LAW A/B Compressor Replacement (003132701)

The inspectors observed portions of the replacement of the Low Assay Withdrawal (LAW) A/B compressor in Building X-333, and the inspectors reviewed portions of the package. The inspectors noted careful and coordinated use of the overhead crane as the replacement compressor was carried over and set in place. However, when the crane work was done, the inspectors observed that the crane checklist was being filled out.

Discussions revealed that the workers believed that they had performed the required steps, and that the post-work documentation was acceptable. Discussions with management revealed that the documentation was required before the crane was used. Plant staff documented the issue in PR-PTS-01-00676. As corrective action, management reminded the mechanics of the requirement to document the functional checks prior to crane use.

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 to SAR Section 6.11. Appendix A of SAR Section 6.11 described crane testing as activities for which procedures shall be implemented. In addition, Step 8.1.14 of Procedure XP3-GP-GP1071, "Operating the Overhead Bridge Crane From The Cab," required that if the crane was operating correctly during required pre-inspection, to document on the applicable sections of the A-5503 inspection form. Contrary to the above, on February 6, plant staff failed to complete the inspection form prior to using a crane in Building X-333. This is a **violation. (70-7002/2001002-01d)**

Surveillance Test Review

The inspectors reviewed a sampling of surveillance testing already completed. Items reviewed and observations are tabulated below.

TSR-Surveillance Requirement (SR) or SAR Requirement	Work Order or Dates of Material Reviewed	Observations and Findings
SR 2.2.3.2.2 Verify that the cluster nitrogen horn and X-300 alarm sounds when two out of three channels in a cluster are tripped. (location SE-2(X-330) (semiannually)	0005431-01 3/16/00 0018331-01 8/17/00	None.
SR 2.2.3.14.2 Verify ACB bus air pressure > 195 psig (daily)	01/2501 to 02/07/01	See Section O.2.
SR 2.1.3.12.2 Perform load test (100% of rated capacity) for Liquid UF6 Handling Cranes (X-342 Overhead Bridge Crane)	11/20/00	None.
SAR 4.3.2.2.1.B "Administrative Controls, Limiting Conditions for Operation, Design Features for Safety, Safety Systems/ 7000-Gallon Geometrically Safe Solution Collection and Storage" monthly leak inspection.	0025859-02 11/6/00 0027992-02 12/6/00 0030679-02 1/15/01 0101978-02 2/5/01	None.
SR 2.1.3.3.1 Perform each channel functional test to verify the autoclave steam supply valve will close when temperature exceeds set point. (Quarterly) Autoclave 1 in X-342 selected.	9932320	None.
	0001469	None.
	0018001	None.
	0026793	None.
SAR 1.18-1 and 1.0/1.19-1: X-705 South Annex Far East HEPA Filter Testing using XP4-TS-XS6204, "HEPA Filter Testing" (annual test)	9931057-01 8/16/2000	None.

c. Conclusions

The inspectors concluded that maintenance was generally being performed in accordance with certificate requirements. However, the inspectors identified multiple examples of failure to follow maintenance procedures due to apparent inattention to detail.

III. Engineering

E1 Conduct of Engineering

E1.1 Engineering Design Activities (88063)

a. Inspection Scope

The inspectors reviewed the design work completed for four modification packages used to install cold traps in the autoclave facilities. Work efforts inspected for these four modifications included all design analyses and calculations (DACs), safety evaluations (SEs), plant change review forms, engineering evaluations, and minutes of the Plant Operations Review Committee (PORC). The inspectors also reviewed the design outputs, including engineering job field instructions (JFIs), engineering change requests/notices (ECRs), procurement specifications, field drawings, and the contractor statement of work for construction of the effluent tower for Building X-343. In addition, the inspectors reviewed the certificatee's procedures for the conduct of modifications and engineering activities.

b. Observations and Findings

The certificatee announced that it would be shutting down the cascade and transitioning to strictly a "shipping and transfer" facility for the next several years while the Paducah Plant developed the capability to analyze and ship product. In the past, the Portsmouth Gaseous Diffusion Plant (PORTS) had utilized the cascade to handle intermediate weight gases in cylinders received from Paducah. However, with the shutdown of the cascade this would not be possible. To allow for this transition, the site instituted a set of modifications for the X-340 complex (including Buildings X-343 and X-344A) to install several cold traps, atmospheric vents with chemical traps, technetium traps for some autoclaves, increased gulper capability, and modifications to some autoclaves. This would allow the PORTS facility to continue to handle intermediate weight gasses that may be present in cylinders shipped from Paducah, and to handle the UF₆ residuals that would be present in piping as a result of handling cylinders.

To evaluate the acceptability of the implementation of these modifications, a three-part inspection effort was developed. These parts involve inspections of the design, installation, and operational testing/turnover from construction of the modifications. This part of the inspection focuses on the design aspects of the modification project. For this inspection, four specific modifications were selected from the list of modifications performed to support the project. The purpose of this inspection was to evaluate the design effort, work instructions, and drawings initially provided to the field for completion of the following modifications:

- removal and installation of three cold traps in Building X-343;
- removal and installation of three cold traps in Building X-344A;
- installation of air ejectors to pull gasses from the cold traps in Building X-343 to the environment; and
- construction of a 110-foot tower to support the exhaust from the Building X-343 air ejector.

The inspectors noted that the procedural process requirements for developing the modifications associated with the X-340 complex were implemented as required. Specifically, an engineering service order was prepared and associated design documents were completed and forwarded to the Change Control Board and PORC for approval. As allowed by the procedure, a significant portion of the work was performed "at risk," meaning that the work was done prior to receipt of final approval for the design. This was the case because the modifications associated with Building X-343 involved the potential for a new accident not previously analyzed in the Safety Analysis Report. Since this was correctly determined by PORTS staff to be an unreviewed safety question, the modifications, including proposed TSR revisions, were submitted to the NRC for review and approval. The approval had not yet been obtained as of the date of the completion of this inspection. The inspectors reviewed the SEs and agreed with the conclusions. The certificatee had written three SEs for each modification, namely one for the removal of equipment, a second for the installation of the equipment, and a third for the operation of the equipment.

The inspectors also determined that the design work associated with the modifications was acceptable. Calculations existed for all design specifications required by site procedures. However, a deficiency was noted with many calculations in that there was a lack of justification to support some inputs to the calculations. Examples included the selection of the k-factor for the voltage drop calculations, the choice of the coefficient of discharge in the orifice sizing calculation, the power consumption values attributed to equipment in cable sizing calculations, and the choice of ambient temperature for the heat tracing calculations.

In DAC-IE-2000-0434, "480 Volt Power Supply" for the cold traps in Building X-343, a k-factor of 12.5 was used, while in DAC-IE-2001-0028, "X-344 480V Voltage Drops for Cold Traps," a k-factor of 12.0 was used. There was no explanation in either calculation why the value was chosen. For normal ambient temperatures, the associated k-factor would normally have been 10.9. The certificatee's reasoning was correct. The use of a higher k-factor provided added margin to the wiring, but this justification was not provided in the calculation.

Similarly, DAC-MC-2000-0480, "Flow Orifice Sizing for Chem Traps/Cold Traps," utilized a coefficient of discharge of 0.84. There was no description in the calculation as to why 0.84 was chosen. For choked flow, this value had a range of 0.75 to 0.84. Again, the certificatee's reasoning was correct, in that the use of a higher coefficient of discharge would have resulted in the maximum hold up time for the flow through the chemical traps, thus, providing for the maximum removal of UF₆ from the discharge stream going to the air ejectors.

Also, in all of the calculations involving equipment power demands and requirements for heat tracing, there was no explanation for the values chosen for the power consumption of the equipment or why an ambient temperature of 65°F was chosen. The inspector determined that the equipment power demands were based on vendor documentation, and the ambient temperature of 65°F was chosen as it represented a minimum temperature that was normally seen in the area, thus providing for the maximum load on the heat tracing tape.

In all cases, the inspectors agreed with the certificatee's ultimate use of the values in the calculations. As a result of these examples, the certificatee generated a problem report

to address the lack of documenting the supporting basis for input values to the calculations. The inspectors also identified several examples of lack of attention to detail. Examples included the use of the ECR form, development of testing procedures to address heat tracing, and the construction specification for the flow orifice in the Building X-343 process lines from the chemical traps to the air ejectors.

Procedure XP3-EG-EG1041, "Engineering Change Request," described the certificatee's process for documenting changes to modification installation work after the initial design drawings and instructions had been approved and issued. The procedure specified that an ECR form be completed. The first page of the form included a description of the change, justification of the change, and identification of affected approved documents. A box on the front also indicated whether the change constituted an engineering change request or an engineering change notice. This determination was based on the "justification for notice screening." If all boxes in the justification were checked, then the document was a notice; otherwise, it was an ECR.

On both ECR-E2320-12 and ECR-E2320-E-1, the front page was documented as a notice, but none of the boxes were checked on the second page, implying that the two should have been ECRs instead. Based on a review of the documents, they were correctly assigned as notices, but the author appeared to have failed to fill out the second page. Similarly, on several ECRs, the affected approved documents were inconsistent. On some ECRs, the documents listed were the current corrected revision to address the specific issue in the ECR. On other ECRs, the documents listed were the previous uncorrected revision that needed to be revised to address the specific issue in the ECR. The certificatee issued a problem report to address the lack of attention to detail in completing ECR forms and the inconsistent specification of affected approved documents.

The test procedure developed to address the adequacy of heat tracing for the process lines provided an acceptance range for the resultant temperature in the line from 175°F to 250°F. However, the associated calculations and JFIs all specified that the design requirement to be verified was 215°F ± 15°F. While both sets of values provided acceptable margin to ensure that the UF₆ in the line would remain in a gaseous form, the test acceptance criteria should have matched the design calculation and JFI. The certificatee issued a problem report to correct this inconsistency.

The last example of inattention to detail involved the construction specification for the orifice to restrict flow through the line between the chemical traps and the air ejectors in Building X-343. The purpose of the orifice was to ensure that there would have been sufficient hold up of the material through the chemical traps to allow removal of the residual UF₆ to levels that would have allowed the exhausted flow to be released directly to the environment and be within regulatory release limits.

The calculation had been performed based on two input UF₆ values, which resulted in two sizes, 0.202 inches in diameter and 0.206 inches in diameter. Based on this, the calculation concluded that the acceptable orifice size was 0.2 inches in diameter. The corresponding construction drawing for the orifice specified that the orifice be 0.2 ± 0.003 inches. Allowing for the maximum tolerance, this would have resulted in an orifice that would have been larger than that specified by the calculation as the minimum required to ensure holdup times sufficient to reduce the material released from the chemical trap to levels below effluent release requirements. The drawing specification

should have determined that the maximum allowable size was 0.2 inches, and specified an orifice size and tolerance that would have ensured that this maximum was not exceeded, rather than using the maximum value as the nominal value.

The safety significance of this discrepancy was minor. The calculation was designed to ensure that effluent release limits were not exceeded at the point of leaving the chemical traps. However, the actual effluent would have been significantly diluted at the air ejector so that even with this orifice sizing discrepancy, releases to the environment would still have been well below allowable levels.

The inspector identified inconsistencies in the certificatee's handling of drawing revisions. Specifically, if the drawing already existed and was being revised to support the modification, each revision to the drawing throughout the installation process was shown on the drawing inside a balloon and each revision was labeled. However, if the drawing was a new drawing, only the latest revision of the drawing was labeled, and nothing was shown in a balloon to indicate what was revised since the previous revision.

This inconsistency was allowed by the certificatee's procedure, XP2-EG-EG1030, "Engineering Drawings." Section 6.3 of the procedure described changes to existing drawings and required that "balloons from a mod are maintained on the drawing until the mod is complete (i.e., A1 balloons are kept on A2...)." Similarly, for new drawings, Section 6.2.9 of this same procedure specified that if changes were made to the modification drawing after approvals, the drafter revised the alpha revision designation to the next highest alpha designation. There was no requirement that the revision to the new drawing be ballooned or that the revision balloons be maintained until the modification was complete. The inspector discussed this inconsistency with engineering management, who stated that they would review the procedure to address this inconsistency.

c. Conclusions

Design requirements for the modifications inspected were clearly specified in engineering JFIs. Calculations had been made to determine critical parameters affecting the modifications. Some deficiencies were noted involving the lack of justification to support some inputs to the calculations, inattention to detail, and the methodology for modifying drawings during the design process.

E8 Miscellaneous Engineering Issues

- E8.1 (Closed) VIO 70-7002/2000006-01A: Failure to identify and promptly correct conditions adverse to quality in response to a reportable event at the Paducah Gaseous Diffusion Plant. Specifically, plant staff failed to take action to correct a lack of double contingency for calibration of non-destructive assay (NDA) equipment, a non-compliance with the Quality Assurance Program (QAP) regarding the quality classification of NDA equipment, and promptly identify the reportability of the deficient NCSA. Plant staff determined that the root cause was that no procedural guidance was developed to perform the calibration of the NDA equipment. The failure to properly classify the NDA equipment was because the control of lab equipment was not addressed during development of the certificate. The failure to promptly report the deficient NCSA was due to a lack of familiarity with the concept of NCS compliance by subject matter expert.

As corrective action, plant staff developed approved procedures for calibrating NDA equipment. In addition, plant staff performed an evaluation of the QAP requirements as they applied to laboratory equipment and determined that QAP Section 2.9, "Control of Processes," applied for controlling the sampling and analysis of NCS significant samples. Plant staff revised applicable procedures to flow down those requirements. Also, training was provided to appropriate production support organization personnel to increase awareness of NCS reportability requirements. The inspectors have no further issues and this item is closed.

- E8.2 (Closed) URI 70-7002/2000006-04: Review quality classification of lab equipment relied on for implementation of NCS requirements and non-safety instrumentation used to ensure TSR compliance. Plant staff performed an evaluation of the QAP requirements as they applied to laboratory equipment and determined that QAP Section 2.9, "Control of Processes," applied for controlling the sampling and analysis of NCS significant samples. Plant staff revised applicable procedures to flow down those requirements.

In addition, the inspectors reviewed the implementation of the enhanced commercial controls requirement program for instrumentation used to ensure compliance with the TSRs that was classified as non-safety (NS) related. Plant staff used that program to provide additional controls to NS components to ensure regulatory compliance. The inspectors determined that the instrumentation was appropriately classified as NS because it was not credited with the prevention or mitigation of an accident as described in the SAR. The inspectors had no further issues, and this item is closed.

IV. Plant Support

P1.1 Health Physics Practices

a. Inspection Scope (83822)

The inspectors observed the health physics practices at the plant. The observation included worker performance and equipment material condition.

b. Observations and Findings

Field Observations

The inspectors observed several workers remove contaminated clothing and monitor themselves for radioactive contamination. One area observed was Building X-333. During maintenance at the LAW [low assay withdrawal] compressor area, the protective equipment requirements were a full set of anti-contamination clothing and a respirator. The inspectors noted inconsistencies in the manner in which anti-contamination clothing was removed. In one instance, a worker forgot to remove his hard hat prior to removing his hood, and as a result the hard hat was inadvertently flung into the arms of a worker outside the contamination boundary. The inspectors noted that the workers immediately frisked the hat and the nearby area for contamination. The inspectors noted that another worker at the same job site removed his coveralls prior to removing his hood and face mask. All workers frisked upon exiting the compressor area. No contamination was detected.

The inspectors reviewed procedure UE2-HP-RP1030, "Conduct of Radiological Operations." Regarding removal of anti-contamination clothing, Appendix G of the procedure provided a typical sequence for removing a full set of protective clothing to protect against spreading contamination. The sequence in the appendix did not include hard hats; it listed removing the hood and the respiratory protection prior to removing coveralls. The inspectors noted that instructions for removal of anti-contamination clothing were present at many step-off pads, but were not present at the LAW A/B contamination boundary. Plant staff documented the issue in PR-PTS-01-00728 and took actions to enhance radiation protection expectations to workers.

Equipment Performance

During routine ingress and egress at the facility, the inspectors verified the calibration dates and the functionality of radiation detection equipment. No problems were noted.

c. Conclusions

The inspectors concluded that workers generally practiced appropriate controls to reduce the spread of contamination. However, some workers failed to follow the recommended guidance for removal of contaminated clothing. The consequences were minimal; however, as the poor practices did not result in contamination of the workers.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the facility management on February 12, 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
- *S. Casto, Outage Manager
- *D. Couser, Training & Procedures Manager
- *L. Cutlip, Engineering Manager
- *D. Fosson, Operations Manager
- S. Fout, Enrichment Plant Manager
- *R. Lawton, Nuclear Safety & Quality Manager
- P. Miner, Regulatory Affairs/Commitment Management Manager
- D. Rogers, Acting Work Control Manager
- *R. Smith, Plant Support Manager
- *M. Wayland, Maintenance Manager

*Denotes those present at the exit meeting on February 12, 2001.

INSPECTION PROCEDURES USED

IP 83822: Radiation Protection
IP 88100: Plant Operations
IP 88025: Maintenance and Surveillance Testing
IP 88063: Engineering
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>
70-7002/2001002-02	URI	The inspectors review of the applicability of normal lighting to TSR 3.26 and the adequacy of plant staff's controls for maintaining the lighting
37640	CER	Safety System Actuation, three Building X-326 Cascade Automatic Data Processing smokeheads located above the Extended Range Product Station actuated.
<u>Closed</u>		
70-7002/2001002-01	VIO	Failure to adhere to plant procedures
70-7002/2000006-01D	VIO	Failure to identify and correct, through a significant condition adverse to quality corrective action plan, that shutdown cascade cells maintained at subatmospheric pressure and containing less than safe uranium mass were not at a UF ₆ negative as required by the applicable NCSAs
70-7002/2000006-01A	VIO	Failure to identify and promptly correct conditions adverse to quality in response to a reportable event at the Paducah Gaseous Diffusion Plant
70-7002/2000006-04	URI	Review quality classification of lab equipment relied on for implementation of NCS requirements and non-safety instrumentation used to ensure TSR compliance
<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
DAC	Design Analysis and Calculation
DNMS	Division of Nuclear Material Safety
DOE	Department of Energy
ECR	Engineering Change Request
IFI	Inspection Follow-up Item
JFI	Job Field Instruction
LAW	Low Assay Withdrawal
NCS	Nuclear Criticality Safety
NCSA	Nuclear Criticality Safety Approval
NDA	Non-destructive Assay
NRC	Nuclear Regulatory Commission
NS	Non-safety
PARS	Publicly Available Records
PERR	Public Electronic Reading Room
PORC	Plant Operations Review Committee
PORTS	Portsmouth
PR	Problem Report
PSS	Plant Shift Superintendent
QAP	Quality Assurance Program
SAR	Safety Analysis Report
SE	Safety Evaluation
TSR	Technical Safety Requirements
UF ₆	Uranium Hexafluoride
URI	Unresolved Item
USEC	United States Enrichment Corporation
VIO	Violation