

September 14, 2001

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

SUBJECT: NRC INSPECTION REPORT 07007001/2001-007(DNMS) AND NOTICE OF VIOLATION (PADUCAH)

Dear Mr. Brown:

On August 21, 2001, the NRC completed a routine resident inspection at the Paducah 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.

In addition, on June 28, 2001, the NRC completed an initial protection of classified matter inspection of the Science Research Laboratory (SRL) facility located in Somerville, Massachusetts. The results of this inspection are also documented in this report. No findings of significance were identified during this initial classified matter inspection of your classified contractor.

Areas examined during the routine resident inspection period are identified in the report. In addition to the normal inspection areas, we also performed a review of your Employee Concerns Program and your Strike Contingency Plan. Within these areas, the inspections consisted of a selective examination of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, the NRC has determined that violations of NRC requirements occurred. The first violation, with two examples, is cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding the violation are described in detail in the subject inspection report. The violation is being cited in the Notice for failure to implement radiation protection and uranium hexafluoride cylinder filling and product withdrawal operations in accordance with the approved written procedures. We understand that human performance issues related to procedure implementation have been identified by your staff, and that you have developed a corrective action plan to address these issues. Therefore, your planned actions to prevent recurrence of the human performance issues are documented in this Report.

Subsequently, the NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and to prevent recurrence is already adequately addressed on the docket in this Inspection Report. Therefore, you are not required to respond to this letter 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.

The NRC has also determined that a second violation of NRC requirements occurred. This certificatee-identified violation, with two examples of procedure implementation issues which each resulted in the loss of a nuclear criticality safety control, is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region III, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, and the NRC Resident Inspector at the Paducah Gaseous Diffusion Plant.

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).

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

Sincerely,

/RA/

Patrick L. Hiland, Chief
Fuel Cycle Branch

Docket No. 07007001
Certificate No. GDP-1

- Enclosures: 1. Notice of Violation
2. Inspection Report 70-7001/2001-007(DNMS)

- cc w/encls: H. Pulley, Paducah General Manager
L. L. Jackson, Paducah Regulatory Affairs Manager
P. D. Musser, Portsmouth General Manager
S. A. Toelle, Director, Nuclear Regulatory Assurance and Policy, USEC
Paducah Resident Inspector Office
Portsmouth Resident Inspector Office
R. M. DeVault, Regulatory Oversight Manager, DOE
W.D. Seaborg, Paducah Site Manager, DOE
J. Volpe, State Liaison Officer

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NOTICE OF VIOLATION

United States Enrichment Corporation
Paducah Gaseous Diffusion Plant

Docket No. 07007001
Certificate No. GDP-1

During an NRC routine inspection conducted from July 6 through August 21, 2001, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

Technical Safety Requirement 3.9.1 requires, in part, that approved written procedures shall be implemented to cover the activities described in Safety Analysis Report Section 6.11.4.1 and as listed in Appendix A to Safety Analysis Report Section 6.11.

Appendix A to Safety Analysis Report Section 6.11 identifies operations and nuclear criticality safety as activities requiring an administrative procedure.

Safety Analysis Report 6.11.4.1 states, in part, that a procedure is required for any task that is described in the Safety Analysis Report. Appendix A to Safety Analysis Report Section 6.11 lists radiation protection and uranium hexafluoride (UF₆) cylinder filling and product withdrawal operations as activities that shall be covered by written procedures.

Procedure CP4-CO-CN2010, "Operation of the C-310 Product and Side Withdrawal System," Revision 10, Section 5.2, required, in part, that if at any time during the performance of the procedure the anticipated result of any step does not occur or any unexplained or unusual condition occurs, the following shall be performed: place the system/component in a safe and stable condition; report condition immediately to the Front Line Manager (FLM); and troubleshoot with the FLM as deemed appropriate. Section 8.7.2 stated, in part, that the C-310 Cylinder Disconnect Sheet, CP-20527, shall be performed; and Steps 4 through 11 of the Sheet required that the manifold digital pressure indication be observed for applicable position for a minimum of 2 minutes with the XV-3PE1 purge and evacuation valve opened.

Procedure UE2-HP-RP1030, "Conduct of Radiological Operations," Revision 2, Section 5.7.2, states in part, that a radiological worker will comply with the general radiological protection requirements listed in Appendix B. Appendix B states, in part, that radiological workers will not move radiological boundaries, unless approved by health physics; radiological workers will stop work and inform supervision and health physics when radiological controls are not being implemented.

Contrary to the above, radiation protection and UF₆ cylinder filling and product withdrawal operations activities were not implemented in accordance with the approved written procedures. Specifically, the certificatee did not implement the approved written procedures as demonstrated in the following examples:

- a. On August 17, 2001, the inspectors identified that operators observed the manifold digital pressure indication for the second evolution of 20 doubling purges on the applicable withdrawal position with the XV-3PE1 valve closed, instead of open, as required by the C-310 Cylinder Disconnect Sheet. In addition, after the inspectors identified this to the operators and the FLM was

initially contacted, the operators began to "troubleshoot" a suspected leaking valve after the system was placed in a safe condition without the FLM, by opening the Liquid UF₆ Block Valve CV-369.

- b. On August 13 and 14, 2001, and on occasions prior to that, the radiological boundaries around the Building C-333A cylinder storage yard were moved by the cylinder handlers without prior health physics' approval during routine cylinder handling evolutions, and the cylinder handlers failed to stop work and inform supervision and health physics when the radiological boundaries were moved.

This is a Severity Level IV Violation (Supplement VI). **(VIO 070-07001/2001-007-01a,b)**

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance will be achieved is already adequately addressed on the docket in Inspection Report 07007001/2001-007. However, you are required to submit a written statement or explanation pursuant to 10 CFR 76.70 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, 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 your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made 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). Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

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

Dated this day of September 2001.

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 07007001
Certificate No: GDP-1

Report No: 07007001/2001-007

Facility Operator: United States Enrichment Corporation

Facility Name: Paducah Gaseous Diffusion Plant

Location: 5600 Hobbs Road
P.O. Box 1410
Paducah, KY 42001

Dates: June 28, 2001
(Science Research Laboratory-Security Inspection)
July 6, 2001, through August 21, 2001
(Resident Inspection)

Inspectors: R. G. Krsek, Acting Senior Resident Inspector
M. L. Thomas, Resident Inspector
S. Caudill, Resident Inspector
J. K. Everly, Senior Facilities Security Specialist
L. M. Numkin, Senior Computer Security Specialist

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

Security Inspection
Approved By: A. Lynn Silvious, Chief
Information Security Branch
Division of Facilities and Security
Office of Administration

EXECUTIVE SUMMARY

United States Enrichment Corporation Paducah Gaseous Diffusion Plant NRC Inspection Report 07007001/2001-007(DNMS)

Operations

- The inspectors concluded that routine operations observed were conducted in accordance with the conduct of operations procedure, and that routine communications among operators were adequate. No nuclear criticality safety issues were identified by the inspectors during the observation of routine operations activities. (Section O1.1)
- The inspectors observed operators perform cylinder disconnect and withdrawal activities. The inspectors identified that operators performed a stable pressure test with a purge and evacuation valve closed when the valve was required to be open, and after the Front Line Manager (FLM) was contacted and the system placed in a safe condition, the operators began to troubleshoot the system without the FLM present. The inspectors identified that failure to implement an approved procedure as prescribed in the procedure steps during the removal of the cylinder from a withdrawal position is an example of a procedure violation. (Section O1.2)
- The certificatee discovered two examples of failure to implement procedures containing nuclear criticality safety controls, which subsequently resulted in the loss of a nuclear criticality safety controls and two Bulletin 91-01 Reports. The first issue involved failure to perform a weekly fluorinating environment check on a cell, and the second issue dealt with failure to maintain the minimum required spacing for waste containers in a storage area. The certificatee identified failure to correctly implement the approved procedures for these operations is a Non-Cited Violation. (Section O1.3)
- The inspectors reviewed the certificatee's actions taken in response to the adverse trend in human performance in day-to-day operations. The inspectors concluded that the action plan developed for this significant condition adverse to quality was comprehensive and addressed the root causes for issues associated with the failure to implement procedures. (Section O7.1)
- The inspectors reviewed USEC's Strike Contingency Plan which was developed to continue operating the gaseous diffusion plant in the event of a strike. The inspectors concluded the following: the minimum number of qualified personnel were available as required for the proper operation and safety of the facility; if implemented, the contingency plan provided guidance to assure that gaseous diffusion plant operation, facility security, and emergency response capabilities would be safely maintained as required; the contingency plan complied with and assured the continued implementation of the Technical Safety Requirements and 10 CFR Part 76 of the Code of Federal Regulations. (Section O8.1)

Maintenance

- The inspectors observed that troubleshooting activities were conducted in accordance with applicable procedures and work orders. The inspectors noted that maintenance and operations staff were knowledgeable of the ongoing work, for the activities

observed. The inspectors identified an inspection follow-up item tracking the resolution of weaknesses in the procedures prescribing troubleshooting activities and the administrative control of jumpers and leads. (Section M1.1)

- The inspectors concluded that the observed or reviewed maintenance and surveillance activities were conducted in accordance with procedure requirements. When questions arose during the performance of maintenance activities regarding a procedure, work was stopped, and the issue was resolved prior to the resumption of work. In addition, the inspectors noted that the acceptance criteria contained in surveillance procedures were adequate, and that when required, Assessment and Tracking Reports (ATRs) were initiated by workers for identified issues. (Section M1.2)

Engineering

- The inspectors performed partial system walkdowns of safety related uranium hexafluoride handling cranes and the vaporization facility autoclaves. In addition, the inspectors reviewed recent ATRs for these systems to verify that no operability concerns existed. The inspectors concluded that the system engineers and operations staff were knowledgeable of the respective systems. (Section E2.1)

Plant Support

- During routine plant tours and walk throughs, the inspectors identified, on two separate occasions, that the contamination control zone postings were moved and knocked down in the Building C-333A cylinder storage yard. Discussion with operators in the facility revealed that the movement of the postings by the cylinder handlers was a routine occurrence. The radiological operations procedure requires that workers not move radiological boundaries, unless approved by health physics. In addition, radiological workers are required to stop work and inform supervision and health physics when the radiological controls were not implemented. The inspectors identified repetitive procedure implementation violations, which included failure to document and correct this repetitive condition adverse to quality in the corrective action process. This is one example of a procedure violation. (Section R1.1)
- The inspectors concluded that the certificatee had developed and was implementing improvement initiatives to address the results of the Nuclear Safety Culture assessments. The inspectors noted that the backlog of concerns was low, and that investigations were generally completed in the timeframe defined in the program procedure. In addition, the inspectors' sample of investigations reviewed verified that the investigations were comprehensive. (Section C6.1)
- An inspection follow-up item was identified regarding responses to individuals who entered concerns into the program through the exit interview process who were not sent results of any follow-up investigation. A second example of a follow-up item was identified in that on-site visibility of the Employee Concerns Program appeared to be low. (Section C6.1)
- A random sample of 30 employees interviewed by the inspectors highlighted that individuals onsite would raise a perceived safety issue by utilizing the established plant processes or NRC processes for reporting safety concerns. Responses concerning the Employee Concerns Program and corrective action programs were consistent with the detailed surveys performed by the certificatee. (Section C6.2)

- The inspectors noted that, while the backlog of open items in the corrective action program may have been slightly reduced compared to the previous two years, there has not been a significant decrease in backlogs. In addition, the inspectors determined that feedback mechanisms to employees who initiated Assessment and Tracking Reports were adequate and several improvements were planned to improve this area. A detailed action plan existed to improve the effectiveness of the corrective action program with many items remaining to be completed, but on schedule. (Section C6.3)

Security and Safeguards

- The inspectors concluded that the Science Research Laboratory staff were prepared to properly implement the physical security requirements contained in the Science Research Laboratory Classified Matter Plan. (Section S1.2)
- The inspectors verified that the Science Research Laboratory staff were prepared to properly implement the storage and control of classified matter procedures contained in the Science Research Laboratory Classified Matter Plan. (Section S1.3)
- The inspectors verified that the Science Research Laboratory staff were in a position to properly implement the classification requirements contained in the Science Research Laboratory Classified Matter Plan, provided that the Facility Security Officer completed Authorized Derivative Classifier training and became familiar with the requirements of Executive Order 12958. (Section S1.4)
- The inspectors verified that the Science Research Laboratory staff were prepared to properly implement the computer security requirements contained in the Science Research Laboratory Classified Matter Plan. (Section S1.5)

Report Details

I. Operations

O1 Conduct of Operations

O1.1 Routine Operations Activities

a. Inspection Scope (88100 and 88020)

The inspectors observed routine operations activities and discussed routine operations with the appropriate operations staff and management.

In addition, the inspectors reviewed the applicable area log books, routine surveillance forms, and observed operators respond to various alarms. The inspectors also reviewed the following procedures:

- CP2-CO-CO1033, "Communications," Revision 2; and
- UE2-OP-OP1030, "Conduct of Operations," Revision 0.

b. Observations and Findings

The inspectors observed routine operations activities in the cascade buildings and area control rooms, vaporization facilities, product and tails withdrawal facilities, and the central control facility. The inspectors reviewed and verified that the appropriate nuclear criticality safety requirements were implemented, if appropriate, for the routine activities observed. Operations staff in the facilities observed were alert and knowledgeable of the current status of equipment associated with the assigned facility. The inspectors noted that when alarms initiated, the operators acknowledged and responded to the alarms in accordance with procedure.

During the inspection period, the inspectors also observed the following significant activities:

- On two occasions, operations staff entered into a plant-wide Limiting Condition for Operation, in order to perform troubleshooting and emergent maintenance activities on the criticality accident alarm system;
- Numerous emergency squad responses to various emergent situations;
- Timely and accurate characterization of events which were subsequently reported to the NRC in the appropriate timeframe; and
- Successful coordination between operations and maintenance staff to address the reduced flow issues in the Top Overlap Header in Building C-335.

In the above instances, the inspectors noted consistent communications among operations staff and other organizations. In addition, the inspectors observed that emergent issues were addressed by operations staff in a consistent, methodical manner, in accordance with applicable procedures, which led to the successful completion of the activity.

c. Conclusions

The inspectors concluded that routine operations observed were conducted in accordance with the conduct of operations procedure, and that routine communications among operators were adequate. No nuclear criticality safety issues were identified by the inspectors during the observation of routine operations activities.

O1.2 Uranium Hexafluoride Cylinder Filling and Product Withdrawal Activities

a. Inspection Scope (88100)

The inspectors observed routine product withdrawal and cylinder filling activities in Building C-310, the Product Withdrawal Facility. The inspectors observed the preparation for cylinder filling, the stopping of cylinder filling and the movement of cylinders containing liquid uranium hexafluoride (UF₆).

The inspectors discussed the operations with the applicable operations staff and reviewed the following Assessment and Tracking Reports (ATRs) and procedures:

- ATRC-01-4216, Violation of CP4-CO-CN2010 In-Hand Procedure;
- CP4-CO-CN2010, "Operation of the C-310 Product and Side Withdrawal System," Revision 10; and
- CP2-CO-CA2031, "Operation of Overhead Cranes," Revision 6.

b. Observations and Findings

On August 17, 2001, the inspectors observed cylinder filling and product withdrawal operations at Building C-310. The inspectors noted that the operators performing the work were knowledgeable of the evolutions which were performed. The inspectors also noted that operations were performed in accordance with procedure, with one exception, which resulted in the failure to implement the approved in-hand procedure.

The inspectors observed the operators remove a cylinder from a withdrawal position as prescribed in Section 8.7 of Procedure CP4-CO-CN2010. Section 5.1 of the procedure, stated, in part, that if during the performance of the procedure, the anticipated result of any step does not occur or any unexplained or unusual condition occurs, the operators shall place the system in a safe configuration, report the condition immediately to the Front Line Manager (FLM) and troubleshoot with the FLM as deemed appropriate.

Section 8.7.2 directs the operators to perform SP-20527, "C-310 Cylinder Disconnect Sheet." Steps 3 through 8 of the disconnect sheet directed the operators to perform a valve line up and the equivalent of 20 doubling purges of the piping which could potentially contain UF₆. Step 9 then prescribed that the operators observe digital pressure indication to ensure that system pressure was stable for a minimum of 2 minutes. If the system pressure were not stable, Step 11 directed the operators to perform a second evolution of 20 doubling purges. If a pressure increase was again observed, the operators were required to contact the FLM for further instructions.

The inspectors observed the following during this portion of the activity:

- the operators performed Steps 1 through 8 of the cylinder disconnect sheet to complete one evolution of 20 doubling purges on the UF₆ piping;
- at Step 9, when the operators were not able to achieve a stable pressure reading, a second evolution of doubling purges was initiated in accordance with Step 11;
- during the performance of Step 9, the observation of pressure indication for the second evolution, an operator at the cylinder put on his respirator and was preparing for the next steps, while an operator at-the-controls of the valves announced that two minutes was approaching and that pressure was stable;
- the inspectors noted at this point that the Purge and Evacuation Valve XV-3PE1 was closed, and was required to be open by Step 4 for the stable pressure test;
- the inspectors confirmed, with a third operator at the job site, that Valve XV-3PE1 was required to be open; the operator at-the-controls of the valve opened XV-3PE1 and pressure indication started to increase again;
- the third operator contacted the FLM and the FLM stated he would be at the job site shortly;
- the operators then began “troubleshooting” the system without the FLM present, through valve manipulations, and discussing that a nitrogen supply valve might be leaking, the operators closed a manual block valve for the nitrogen supply and also opened the Liquid UF₆ Block Valve CV-369 which was not manipulated during this portion of the procedure; and
- the FLM arrived at the job site and instructed the operators to perform a third evolution of 20 doubling purges, and after this third evolution the pressure indication test was successful and the operators continued on with the procedure.

The operators continued on with the procedure, and the inspectors did not identify any further issues. However, the inspectors discussed with the operators and FLM that the in-hand procedure was not implemented, as required, in accordance with the approved cylinder disconnect sheet and Procedure CP4-CO-CN2010. While Step 9 was performed on the second evolution of 20 doubling purges, the inspectors noted that the XV-3PE1 Purge and Evacuation Valve had been inadvertently closed, and the FLM was contacted after the inspectors identified this to the operators and the valve was reopened. In addition, before the FLM arrived at the job site, the operators had begun troubleshooting. Opening the Liquid UF₆ Block Valve CV-369 did not constitute an action to place the system in a safe condition, as this removed one isolation point for the liquid UF₆ piping. Also, the observation that pressure was stable when the XV-3PE1 Purge and Evacuation Valve was closed indicated that the two liquid UF₆ block valves were not leaking-by based on the system configuration. Finally, when the FLM arrived at the job site, he only directed that a third evolution of doubling purges be completed, and after this the pressure test was successful.

Technical Safety Requirement 3.9.1, states, in part, that written procedures shall be implemented to cover activities described in Safety Analysis Report Section 6.11.4.1 and listed in Appendix A to Safety Analysis Report Section 6.11. Safety Analysis Report 6.11.4.1 states, in part, that a procedure is required for any task that is described in the Safety Analysis Report, and Appendix A to Safety Analysis Report Section 6.11 lists UF₆ cylinder filling and product withdrawal operations as activities that shall be covered by written procedures. Procedure CP4-CO-CN2010, "Operation of the C-310 Product and Side Withdrawal System," Revision 10, Section 5.2, requires, in part, that if at any time, during the performance of the procedure, the anticipated result of any step does not occur or any unexplained or unusual condition occurs, the following shall be performed: place the system/component in a safe and stable condition; report the condition immediately to the FLM; and troubleshoot with the FLM as deemed appropriate. Section 8.7.2 stated, in part, that the C-310 Cylinder Disconnect Sheet, CP-20527, be performed and Steps 4 through 11 of the Sheet required that the manifold digital pressure indication be observed for the applicable withdrawal position for a minimum of 2 minutes with the XV-3PE1 P&E valve opened.

Contrary to the above, the observation of stable manifold digital pressure indication for the second evolution of 20 doubling purges was performed with the XV-3PE1 valve closed, instead of open as required by the C-310 Cylinder Disconnect Sheet. In addition, after the inspectors identified this to the operators and the FLM was initially contacted, the operators began to "troubleshoot" a possible leaking valve after the system was placed in a safe condition without the FLM, by opening the Liquid UF₆ Block Valve CV-369. This failure to implement the prescribed requirements and action steps in an approved procedure is an example of a Violation of the Technical Safety Requirements. **(VIO 070-07001/2001-007-01a)**

The certificatee documented this issue in ATRC-01-4216. In addition, the certificatee was currently addressing generic issues associated with human performance and the failure to follow procedures. These generic corrective actions are described in Section O7.1 of this Report.

c. Conclusions

The inspectors observed the operators perform cylinder disconnect and withdrawal activities. The inspectors identified that operators performed a stable pressure test with a purge and evacuation valve closed when the valve was required to be open, and after the FLM was contacted and the system placed in a safe condition, the operators began to troubleshoot the system without the FLM. The inspectors identified that the failure to implement an approved procedure as prescribed in the procedure steps during the removal of the cylinder from a withdrawal position was an example of a violation.

The certificatee has taken corrective actions to address procedure implementation issues, and these actions are discussed in Section O7.1 of this Report.

O1.3 Operations Activities Associated with Nuclear Criticality Safety

a. Inspection Scope (88020)

The inspectors reviewed the initial response, and interim actions for the certificatee-identified instances of failure to follow procedures which resulted in Bulletin

91-01 Reports for the loss of nuclear criticality safety controls. The inspectors also discussed issues with the appropriate operations and nuclear criticality safety staff.

The inspectors reviewed the following ATRs and procedures:

- ATRC-01-3377, C-335 U/4 C/8 Shut Down without Weekly Check;
- ATRC-01-4043, Violated Spacing Requirement of NCSA GEN-15;
- UE2-OP-OP1030, "Conduct of Operation," Revision 0;
- CP4-CO-CN2004, "Cell Evacuation," Revision 10;
- CP4-CO-CN6069, "Periodic Regulatory Checks," Revision 16; and
- CP4-EW-MW2100, "Operation of Temporary Fissile Storage Areas (TSFA) and Consolidation Areas," Revision 8.

b. Observations and Findings

The certificatee identified two instances where personnel did not comply with procedural requirements for approved procedures, both of which resulted in Nuclear Criticality Safety (NCS) violations and Bulletin 91-01 Reports. The two instances were as follows:

- On June 27, 2001, operators performed a procedure review for UF₆ negative cells and discovered that in Building C-335, Unit 4, Cell 8 was shut down with the fluorinating environment left in, the R-114 moisture not known, and no weekly fluorinating check initiated for the presence of the fluorinating environment. Procedure CP4-CO-CN2004, "Cell Evacuation," Section 8.1.10.C required that if a cell was not independently verified to be less than 1.0 wt. percent ²³⁵U according to CP2-EG-NS1033 and R-114 moisture was unknown, that weekly checks be initiated (within 7 days) for the presence of a fluorinating environment according to CP4-CO-CN6069, "Periodic Regulatory Checks." Procedure CP4-CO-CN6069, Section 8.3.10, stated, in part, that when a cell with a fluorinating environment was isolated from the cascade and the R-114 water content was unknown, the operators were required to confirm the presence of a fluorinating environment weekly by sampling according to CP4-CO-CN2033 and recording the data on CP-22511. As a result, the certificatee determined that the weekly check required to be initiated within 7 days for the presence of a fluorinating environment was not initiated until after 14 days. This condition adverse to quality was documented in ATR No. ATRC-01-3377 and reported in Event No. 38101.
- On August 8, 2001, during the movement of waste in a Temporary Fissile Storage Area in Building C-335, certificatee staff observed an operator momentarily place a potentially fissile 5.5-gallon waste drum in the corner of a containment pan instead of the physical restraint, which was closer than two feet from another potentially fissile waste drum. The operator then continued the task, and transported the drum to a desired location. The requirements of Nuclear Criticality Safety Approval GEN-15 stated that a minimum two foot edge-to-edge spacing was required between fissile and potentially fissile waste

containers. Procedure CP4-EW-MW2100, "Operation of Temporary Fissile Storage Areas (TSFA) and Consolidation Areas," Section 8.2.1, required the use of physical restraints, arranged in a square-pitched array for each container size, to maintain the two-foot minimum edge-to-edge spacing between waste containers. In addition, Section 8.2.3, stated, in part, that the operator notify NCS of any condition that adversely affects criticality safety of a Temporary Fissile Storage Area. Contrary to these requirements, the operator did not utilize the physical restraint in a containment pan and subsequently did not maintain the 2-foot spacing requirement between waste containers when momentarily placing a potentially fissile drum in the corner of a containment pan. This condition adverse to quality was documented in ATR No. ATRC-01-3901 and reported in Event No. 38191.

As a result of these ATRs, the certificatee performed an initial response and took immediate interim actions to correct these situations. The responses included the issuance of Procedure CP4-CO-CN2075, "Operation of Cascade Recirculating Cooling Water Systems," to give guidance on control of Recirculating Cooling Water systems and revising Procedure CP4-CO-CN6069 to reduce the amount of time required for the initial sampling of a cell for moisture. In addition, a stand-down of waste management staff was initiated until briefings of the requirements of Procedure CP4-EW-MW2100 to re-emphasize the nuclear criticality safety requirements for Temporary Fissile Storage Areas. Commitment Management also initiated ATR No. ATRC-01-3901 to document an adverse trend in nuclear criticality safety violations.

Technical Safety Requirement 3.9.1 requires, in part, that written procedures shall be implemented for activities described in Section 6.11, Appendix A of the Safety Analysis Report. Safety Analysis Report 6.11.4.1 states, in part, that a procedure is required for any task that is described in the Safety Analysis Report. Appendix A to Safety Analysis Report, Section 6.11 lists Cascade Cells and Nuclear Criticality Safety operations as activities that shall be covered by written procedures. On June 27, 2001, the certificatee identified the failure to implement the approved procedures for the weekly fluorinating environment check on a cell. On August 8, 2001, the certificatee identified the failure to maintain the two-foot spacing requirements for waste containers. These non-repetitive, certificatee-identified and corrected violations are being treated as a Non-Cited Violation, consistent with Section VI.A.8 of the NRC Enforcement Policy. These violations are in the certificatee's corrective action program as ATRs ATRC-01-3377, and ATRC-01-3901. **(NCV 70-7001/2001-007-02a,b)**

The certificatee has taken corrective actions to address procedure implementation issues, and these actions are discussed in Section O7.1 of this Report.

c. Conclusions

The certificatee identified two examples of failure to implement procedures containing nuclear criticality safety controls, which subsequently resulted in the loss of a nuclear criticality safety controls and two Bulletin 91-01 Reports. The first issue involved the failure to perform a weekly fluorinating environment check on a cell, and the second issue dealt with the failure to maintain the minimum required spacing for waste containers in a storage area. The certificatee recognized and was actively addressing recent human performance issues which have resulted in procedure violations. The failure to correctly implement the approved procedures for these operations is a Non-Cited Violation.

07 Quality Assurance in Operations

07.1 Human Performance Improvement Initiatives

a. Inspection Scope (88100)

Since the Spring of 2001, the plant staff has identified numerous human performance issues related to the implementation of procedures. As a result of these issues, plant management has developed and started implementation of action plans to address these human performance issues.

During the inspection period, the inspectors reviewed the action plans which were developed; the inspectors then discussed the corrective actions with plant management and commitment management staff.

b. Observations and Findings

As a result of adverse trends in human performance at the plant, a human performance improvement plan was initiated. Assessment and Tracking Report No. ATRC-01-1827 was consolidated with several other ATRs in order to fully scope and evaluate these issues and to develop actions to prevent recurrence for this significant condition adverse to quality.

The inspectors noted that the scope of the actions planned was comprehensive, and the inspectors noted that some of the developed actions included the following:

- Issue memoranda to all personnel reinforcing the need for procedure compliance and reemphasize these points during a shift stand-down meeting. The following major points were addressed in this action:
 - front line managers [FLMs] will perform briefings on any task or evolution that results in operation of equipment;
 - procedures shall be followed step-by-step or the job stopped;
 - cover sheets will be utilized to document the following for each procedure used for operation: the pre-brief; identity of users; and management review of the procedure; and
 - when an error does occur, the responsible manager will be involved with the investigations and development of corrective actions.
- Prior to the start of an evolution which involves nuclear criticality safety requirements from Nuclear Criticality Safety Approvals CAS-02 and CAS-011 (new due to High Assay Upgrade Project), the section or group manager must be contacted prior to the start of the evolution to ensure that appropriate reviews were performed;
- Develop a briefing on Procedure CP2-PS-PS1044, "Use of Procedures," for delivery by line management to all employees participating in the human performance program;

- General Manager will develop a memorandum to all Functional Organization Managers that formalizes the following tasks:
 - include comments on adherence to the 10-pillar expectations during the required monthly “Management By Walking Around” observation reports;
 - include at least one self-assessment of specific techniques from the FLMs’ Handbook in the self-assessment plan;
 - develop performance indicators with limits or goals for events for each work group attributable to the failure to follow in-hand procedures;
- Crew briefings conducted for group managers to FLMs and FLMs to assigned crews covering the use of procedures;
- Operations Functional Directive issued to require employees to initial and “place keep” next to each step performed in an in-hand procedure;
- Every month issue a “Prevent Events” letter detailing a factual assessment of issues in the past month relating to human performance;
- Initiate a Procedure Quality and Compliance Review Program; and
- Perform end-point assessments of the actions to assure effectiveness.

The actions noted above are not an all inclusive list of actions planned or taken; however, this details the major initiatives plant management has undertaken to address this significant condition adverse to quality. The inspectors also noted that the development and implementation of the action plans was on schedule.

c. Conclusions

The inspectors reviewed the certificatee’s actions taken in response to the adverse trend in human performance in day-to-day operations. The inspectors concluded that the action plan developed for this significant condition adverse to quality was comprehensive, and it addressed the root causes for issues associated with the failure to implement procedures.

O8 Miscellaneous Operations Issues

O8.1 Strike Contingency Plan

a. Inspection Scope (92709)

On July 31, 2001, the union contract between the Paper, Allied-Industrial, Chemical and Energy Workers International Union (PACE) Local 5-550 and the United States Enrichment Corporation ended. The PACE Union represents approximately 700 operations, maintenance and administrative workers at the Paducah Gaseous Diffusion Plant.

The inspectors evaluated the adequacy of the USEC Strike Contingency Plan content to determine the following:

- if the minimum number of qualified personnel was available, as required, for the proper operation and safety of the facility;
- if gaseous diffusion plant operation and facility security would be maintained as required; and
- if the plan complies with the Technical Safety Requirements and the 10 CFR Part 76 of the Code of Federal Regulations.

b. Observations and Findings

A Strike Contingency Plan was developed by USEC to continue operating the gaseous diffusion plant in the event of a strike using non-union and management personnel. About 700 workers were represented by the PACE union. A large number of non-union staff and management personnel were unavailable who previously held positions as operators and maintenance workers. The contingency plan was developed to ensure that the plant was operated safely and to assure regulatory requirements were adhered to in the event of a work stoppage.

The inspectors reviewed the Strike Contingency Plan and verified that the contingency plan was reviewed and approved by site management. In addition, the inspectors held discussions with site management to determine the impact of a strike including the number and disciplines of bargaining unit employees and verified that the strike contingency planning was adequate. The inspectors noted during these discussions that the plant security force would be unaffected by a PACE Union strike, as the security guards were members of a separate union, and their contract contained a “no strike” clause. In addition, the inspectors determined that health physics, laboratory operations and engineering activities would also remain unaffected by a strike, if it were to occur. Therefore, no changes to either the Physical Security Plan or the certificate would be required if a strike were to occur.

The inspectors also compared the contingency plan to the minimum staffing requirements contained in Table 3.2.2.1 of the Technical Safety Requirements. The inspectors noted during these reviews that the minimum number of staff required were met based on the contingency plan. As a part of this inspection, a random selection of the plant staff’s qualification requirements for designated positions were reviewed. For the random selection of operations employees chosen, the inspectors compared qualification requirements of a position to the training history for an individual. While minor examples of administrative issues associated with the worker evaluation forms used to document qualification were identified, the inspectors noted that in all cases, the qualifications required for an individual were met.

The inspectors also reviewed a sample of qualifications for employees chosen to fill positions in the maintenance, security, and fire services organizations. No issues were identified. The inspectors noted that the maintenance tasks required for continued safe plant operation and implementation of Technical Safety Requirement Surveillances had qualified personnel assigned.

The inspectors verified that the contingency plan addressed the use of other local agencies to ensure unimpeded access of personnel to the plant, mitigation of any possible threat to the site, and unimpeded access of medical care and ambulance services to treat injured personnel. The inspectors also verified that the contingency plan contained a sufficient number of qualified personnel to implement the site emergency plan and to staff the emergency squad. Finally, the inspectors noted the contingency plan provided direction to assure that emergency communication equipment would remain available.

At the end of the inspection period, the union contract continued to be negotiated between the PACE Union and USEC, and the PACE Union had agreed to give USEC 24 hours advance notice if a strike were to occur.

c. Conclusions

The inspectors reviewed USEC’s Strike Contingency Plan which was developed to continue safe operations in the event of a strike. The inspectors concluded the following: the minimum number of qualified personnel were available for the safe operation of the facility; if implemented, the contingency plan provided adequate guidance to assure that gaseous diffusion plant operation, and facility security and emergency response capabilities would be maintained as required; and the contingency plan detailed necessary steps to assure the continued implementation of the Technical Safety Requirements and 10 CFR Part 76 of the Code of Federal Regulations.

O8.2 Certificatee Event Reports (90712)

The certificatee made the following operations-related event reports 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 reports for the events following submittal, as applicable.

<u>Number</u>	<u>Date</u>	<u>Status</u>	<u>Title</u>
38088	7/9/01	Closed	Retraction of Original Event Report Made on June 23, 2001, for a Loss of Power to Building C-333 Criticality Accident Alarm System (CAAS) Beacons
38182	8/2/01	Open	Safety System Actuation - Building C337A, Autoclave No. 2W Steam Pressure Control System Actuation

O8.3 Bulletin 91-01 Reports (90712)

The certificatee made the following reports pursuant to Bulletin 91-01 during the inspection period. The inspectors reviewed any immediate NCS concerns associated with the reports at the time of the initial verbal notification and the reports are considered

closed unless discussed specifically below. The inspectors' reviews for Bulletin 91-01 Numbers 38101 and 38191 are discussed in Section 01.3 of this report, and the reports are considered closed. Follow-up of Bulletin 91-01 Number 38155 will be conducted during the next annual Nuclear Criticality Safety Inspection.

<u>Number</u>	<u>Date</u>	<u>Title</u>
38101	6/27/01	24-Hour Report - Weekly Fluorinating Environment Check Not Completed on Building C-335 Unit 4, Cell 8 (Identified as a Non-Cited Violation as discussed in Section O1.3)
38113	7/10/01	Update of Original July 2, 2001, 24-Hour Report on Unapproved Cylinder Washed at Building C-400 Cylinder Wash Stand
38155	7/19/01	4-Hour Report - Deficient Nuclear Criticality Safety Evaluation of Nuclear Criticality Safety Approvals GEN-10 and CAS-011 (Follow-up during next annual Nuclear Criticality Safety Inspection)
38161	7/23/01	24-Hour Report - Failure to Perform Clarity Check on Recirculating Cooling Water Pressure Gauge
38161	8/7/01	Update of Original July 23, 2001, 24-Hour Report stating that Clarity Check on Recirculating Cooling Water Pressure Gauge was actually performed and no loss of a control existed
38191	8/8/01	24-Hour Report - Loss of One Control During Waste Management Operation Which Resulted in a Spacing Violation

II. Maintenance and Surveillance

M1 Conduct of Maintenance and Surveillance

M1.1 Troubleshooting Activities

a. Inspection Scope (88103)

The inspectors reviewed and, when possible, observed troubleshooting activities which took place during the inspection period for emergent equipment issues. The inspection consisted of observing work activities in progress, when possible, reviewing completed work packages, and discussion with the appropriate operations, maintenance, engineering and quality assurance staff.

The inspectors also reviewed the following ATRs and procedures:

- ATRC-01-3865, Weakness in Configuration Control Program for Normal Operation;

- CP3-GP-GP4110, “Administrative Control of Jumpers and Leads,” Revision 1;
- CP2-PO-FO1031, “Independent Verification,” Revision 1;
- CP2-GP-GP1038, “Troubleshooting Guidelines,” Revision 1; and
- CP2-GP-GP1032, “Work Control Process,” Revision 6.

b. Observations and Findings

The inspectors reviewed and, when possible, observed the troubleshooting activities documented in the following Work Packages:

- 0108523-01, Troubleshoot and Repair Programmable Logic Controller for Autoclave 1 West in Building C-337A;
- 0108502-02, Troubleshoot/Repair/Replace Remote Interface Module in Rack No. 3 for Autoclave 1 West in Building C-337A;
- 0108755-01, Repair/Replace Cluster Trouble Relay and Diode for Building C-710 “AR” Cluster Located in Building C-300 Basement; and
- 0108111-01, Troubleshoot/Repair Trouble Alarms on C-300 Criticality Accident Alarm System Console for the “AN, AP, and AR” Clusters.

The inspectors noted that for the troubleshooting activities which were observed there was clear communication among operations, maintenance and engineering staff. The inspectors did not identify any significant issues in the scope, documentation and work practices observed and reviewed for the troubleshooting activities. The inspectors noted that when workers were unsure, work was stopped, the Front Line Manager consulted and then, if applicable, work resumed. In addition, any issues or problems certificatee staff encountered during the activities were entered into the certificatee’s corrective action system.

During the review of the certificatee’s procedures, the inspectors did identify a weakness in maintenance Procedures CP2-GP-GP1038, “Troubleshooting Guidelines,” and CP3-GP-GP4110, “Administrative Control of Jumpers and Leads.” The procedures may not provide the necessary controls to assure effective implementation of the intent of the procedures in terms of quality assurance and configuration control. Some relevant examples of this include the following:

- the procedures only control jumpers and leads landed in terminal sockets without consideration to other temporary or permanent system alterations that could affect the design of equipment;
- the procedures only apply to conditions which involve more than one lifted lead or jumper, which may be acceptable if equipment was out-of-service; however, this may not be acceptable if a lead or jumper was lifted or added to in-service equipment;
- temporary system alterations to in-service equipment were not required to be approved or discussed with operations staff prior to implementing a change,

which may prevent personnel responsible for safe operation of the plant from knowing, in advance, what alterations were to be made; and

- the configuration control log sheet states in the description section that the log was applicable to a variety of operations including valve manipulations and configuration modification required; however, the action steps of Procedure CP2-GP-GP1038 require the log sheet only for lifting multiple leads.

The certificatee staff concurred with the inspectors' observations and ATRC-01-3865 was written to document these issues. Although these weaknesses were identified, the inspectors did not identify any performance issues as a result of these weaknesses, and the intent of the procedures were met in the activities observed. However, the inspectors will continue to track the resolution of this issue as an Inspector Followup Item. **(IFI 070-07001/2001-07-03)**

c. Conclusions

The inspectors concluded that troubleshooting activities observed were conducted in accordance with applicable procedures and work orders. The inspectors noted that maintenance and operations staff were knowledgeable of the ongoing work, for the activities observed. The inspectors identified one inspection follow-up item to track the resolution of identified weaknesses in the procedures prescribing troubleshooting activities and the administrative control of jumpers and leads.

M1.2 Maintenance and Surveillance Activity Reviews

a. Inspection Scope (88102 and 88103)

The inspectors observed selected safety system surveillance and maintenance activities to verify that the activities were performed safely, and in accordance with the Technical Safety Requirements and applicable procedure requirements.

The inspectors also reviewed the applicable sections of the Technical Safety Requirements and Safety Analysis Reports in addition to the following procedures:

- CP4-GP-EM6143, "C-331 and C-335 Building Process Cell Trip Test," Revision 2;
- CP4-GP-IM6263, "C-333A and C-337A P-515 Loop Calibration and Functional Test of Autoclave Opening Prevention System, Steam Pressure Control System, and High Pressure Isolation System," Revision 5;
- CP4-GP-IM6261, "C-333A and C-337A - Calibration and Functional Testing of Autoclave Cylinder Relief System," Revision 3;
- CP4-GP-IM6258, "C-333A and C-337A P-514 Loop Calibration and Functional Test of Autoclave Opening Prevention System, Steam Pressure Control System, and High Pressure Isolation System," Revision 4;
- CP4-CO-CA2035, "Pre-Use Inspection of UF₆ Handling Cranes," Revision 1
- CP4-CO-CM6023, "Shipment, Receipt, and Inspection of UF₆ Cylinders," Revision 13;

- CP4-CO-CA2032, "Operation of the UF₆ Cylinder Weigh Scales," Revision 6;
- CP4-GP-IM6239, "C-710 Criticality Accident Alarm System Annual Cluster Replacement and Functional Tests," Revision 2; and
- CP4-CO-CN6054c, "TSR Surveillance - C-333A/337A Autoclave Pressure Decay Test," Revision 6.

b. Observations and Findings

For the maintenance and surveillance activities listed below, the inspectors verified one or more of the following: activities observed were performed in a safe manner; testing was performed in accordance with procedures; measuring and test equipment was within calibration; Technical Safety Requirement Limiting Conditions for Operation were entered, when appropriate; removal and restoration of the affected components were properly accomplished; test acceptance criteria were clear and conformed with the Technical Safety Requirements and Safety Analysis Report; and any deficiencies or out of tolerance values identified during the testing were properly documented, reviewed and resolved by appropriate management personnel.

Maintenance Activities

- Work Order 0103710-01, Perform Routine Transformer/Cell Maintenance During Process Transformer Outage on Unit 2, Cell 4 in Building C-331;
- Work Order 0104800-01, Annual Calibration and Functional Testing of Autoclave 4 South in Building C-333A;

Surveillance Activities

- Confirmation that UF₆ cylinder weigh scales were operable in accordance with Procedure CP4-CO-CA2032;
- Performance of UF₆ cylinder pre-heat or pre-fill visual inspections in accordance with Procedure CP4-CO-CM6023;
- Building C-710 Criticality Accident Alarm System Functional Tests in accordance with Procedure CP4-GP-IM6239; and
- Autoclave Pressure Decay Test on Autoclave 1 North in Building C-333A in accordance with Procedure CP4-CO-CN6054c.

The inspectors observed plant staff implement the appropriate radiological controls for performing activities, when applicable. In addition, the inspectors noted that during maintenance activities, when a question or issue regarding the procedure was made, work was stopped; the Front Line Manager was contacted; and the question or issue was resolved prior to the resumption of work. The inspectors also observed that Front Line Management periodically checked and evaluated the status of ongoing work.

c. Conclusions

The inspectors concluded that the maintenance and surveillance activities which were observed or reviewed were conducted in accordance with procedure requirements. When questions arose during maintenance activities regarding a procedure, the work was stopped, and the issue was resolved prior to the resumption of work. In addition, the inspectors noted that the acceptance criteria contained in surveillance procedures were adequate, and that when required, ATRs were initiated by workers for identified issues.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 System Walkdowns

a. Inspection Scope (88101)

The inspectors performed system walkdowns of the cylinder handling cranes in Buildings C-333A, C-360, C-310 and C-315, and the autoclaves in Building C-333A. As part of the walkdowns, the inspectors reviewed the applicable Technical Safety Requirement and Safety Analysis Report Sections, process and instrumentation diagrams, and engineering analyses and documentation. The inspectors also discussed the systems with operations, maintenance and engineering staff, and reviewed recent ATRs identified by the certificatee for the system.

The inspectors also reviewed the following ATRs and procedures:

- ATRC-01-4253, The protective bellows is missing on the Southwest Crane Buffer of the Building C-333A West Crane, identified by NRC;
- ATRC-01-4029, Building C-360 East Crane Rail Stop have Deteriorated Wooden Inserts at the East End;
- ATRC-01-3970, Building C-337A, No. 1 Autoclave went into halt;
- ATRC-01-3974, Building C-337A, No. 1 Autoclave went into halt for third time;
- ATRC-01-3969, Building C-337A, Received High Autoclave Steam Pressure Alarm on No. 2 West;
- ATRC-01-3978, Wrong Power Supply Replaced on Position 1 West in Building C-337A; and
- ATRC-01-4139, During an NRC walkdown, the inspectors found the vent line plugged on the C-333A, 2 South Conductivity System; no other lines were plugged on the other autoclaves.

b. Observations and Findings

The inspectors performed partial field walkdowns of the following systems and respective components:

- Building C-360, C-333A and C-315 UF₆ cylinder handling cranes; and
- Autoclaves in Building C-333A and C-337A.

As part of the walkdowns, the inspectors reviewed and compared the as-built configuration to the appropriate design documents, including process and instrumentation diagrams. In addition, the inspectors also discussed the systems with the respective system engineers. For a random selection of components, the inspectors verified that the assumptions in engineering analyses were consistent with the as-built configuration of the system or component.

The inspectors verified, through discussions, that operators assigned to those areas were familiar with the operation and current condition of the respective systems. The inspectors also reviewed recent ATRs for the systems to verify that the safety functions of the systems were not affected by any adverse conditions identified by the certificatee. In all instances, the justification for operability was evaluated and no operability concerns existed.

The inspectors identified some minor configuration control issues with an as-built component and the corresponding plant drawings; however, the issues were all minor in nature and did not affect equipment operability in any way. Finally, the inspectors verified that no temporary modifications on the systems existed which would preclude the system or components from performing the intended safety function.

c. Conclusions

The inspectors performed partial system walkdowns of safety related UF₆ handling cranes and the vaporization facility autoclaves. In addition, the inspectors reviewed recent Assessment and Tracking Reports for these systems to verify that no operability concerns existed. The inspectors concluded that the system engineers and operations staff were knowledgeable of the respective systems.

IV. Plant Support

R1 Radiation Protection Controls

R1.1 Radiation Control Boundaries and Practices

a. Inspection Scope (83822)

During routine plant tours and inspections, the inspectors observed and assessed the postings of radiological control boundaries and observed operator work practices related to radiological controls.

The inspectors also reviewed the following ATRs and procedures:

- ATRC-01-4158, NRC inspectors noted that the radiation control boundary around the cylinder yard in Building C-333A had been knocked down twice by the cylinder haulers;
- UE2-HP-RP1030, "Conduct of Radiological Operations," Revision 2 ;

- CP2-BM-CI1031, “Corrective Action Process at the Paducah Gaseous Diffusion Plant”;
- CP2-CO-CO1033, “Communications,” Revision 2; and
- UE2-OP-OP1030, “Conduct of Operations,” Revision 0.

b. Observations and Findings

The inspectors noted during the inspection period that, in general, radiological controls and boundaries were implemented in various buildings and areas onsite, as required. However, during routine tours, the inspectors identified a deficiency in the Building C-333A Cylinder Yard with respect to radiological controls and boundaries.

During observations at the Building C-333A cylinder storage yard facility, the inspectors noted that the south postings for the contamination control zone around the cylinder storage yard were moved and knocked over onto the ground. The inspectors informed the operators at the facility; health physics was notified, as required; and the boundary and postings were reestablished.

The following day, the inspectors returned to the facility and again noted that the postings were moved and knocked over onto the ground. The inspectors again informed the operators at the facility; the health physics staff was notified, as required; and the boundary and postings were re-established. The inspectors discussed this recurrence with the operations staff in the facility and the health physics staff and learned that this was a routine occurrence. Cylinder haulers routinely removed empty cylinders, which had been surveyed for radioactive contamination from the cylinder storage yard and, in the process of doing so, moved the radiological boundary or knocked down the postings. The inspectors also determined, that when this occurred, the cylinder handlers did not notify health physics that the boundary was moved, and later in the day, the operators or health physics technicians discovered the condition.

Moving radiological postings, unless authorized by the health physics organization, was prohibited by the conduct of radiological operations procedure. In addition, individuals were required to stop work and inform supervision and health physics when radiological controls, such as radiological postings, were not implemented. The certificatee and inspectors did not identify any instances where inadvertent contaminations or Radiological Work Permit violations occurred as a result of this issue.

However, the repetitive movement of the postings during routine cylinder handling operations and the failure to inform supervision and health physics that the controls were not implemented when the postings were moved by the cylinder handlers, was an example of the failure to implement approved procedures for the conduct of radiological operations. The repetitive nature and the failure to self identify, document, and correct this condition adverse to quality in the corrective action process contributed to the significance of this issue.

Technical Safety Requirement 3.9.1, states in part, that written procedures shall be implemented to cover activities described in Safety Analysis Report Section 6.11.4.1 and listed in Appendix A to Safety Analysis Report Section 6.11. Safety Analysis Report

6.11.4.1 states, in part, that a procedure is required for any task that is described in the Safety Analysis Report, and Appendix A to Safety Analysis Report Section 6.11 lists radiation protection as an activity that shall be covered by written procedures. Procedure UE2-HP-RP1030, "Conduct of Radiological Operations," Revision 2, Section 5.7.2, stated in part, that a radiological worker complies with the general radiological protection requirements listed in Appendix B. Appendix B stated in part, that radiological workers will not move radiological boundaries unless approved by health physics, and that radiological workers stop work and inform supervision and health physics when radiological controls were not implemented. The movement of the radiological boundaries by the cylinder handlers during routine cylinder handling evolutions, and the failure of the operators to stop work and inform supervision and health physics when the radiological boundaries were moved is another example of a Technical Specification Requirement procedure Violation. **(VIO 070-07001/2001-007-01b)**

The certificatee documented this issue in ATRC-01-4158. Immediate corrective actions taken included discussions between health physics and operations management, and crew briefs for the cylinder handlers which included a discussion of the requirements for the conduct of radiological operations. In addition, the certificatee was currently addressing generic issues associated with human performance and the failure to follow procedures. These generic corrective actions are described in Section O7.1 of this Report.

c. Conclusions

During routine plant tours and inspections, the inspectors identified, on two separate occasions, that the contamination control zone postings were moved and knocked down in the Building C-333A cylinder storage yard. Discussion with operators in the facility revealed that the movement of the postings by the cylinder handlers was a routine occurrence. The conduct of radiological operations procedure required that workers not move radiological boundaries, unless approved by health physics. In addition, radiological workers were required to stop work and inform supervision and health physics when the radiological controls were not implemented. The inspectors' identification of repetitive procedure implementation violations was an example of a procedure violation.

C6 Miscellaneous Self-Assessment Activities

C6.1 General Inspection Scope

On December 8, 1997, the NRC issued a letter to USEC regarding the "Recognition of Issues Related to Chilling Effects." Subsequent to that initial correspondence from the NRC, a management meeting was held at NRC Headquarters on January 15, 1998, to discuss the basis for the NRC's concerns. At the conclusion of the January 15, 1998, meeting, the NRC accepted a proposed response date of June 1, 1998, for USEC to evaluate and respond to the NRC's December 8, 1997, letter. On June 1, 1998, USEC provided their initial response and on June 29, 1998, a management meeting was held to review the results of USEC's independent survey and Nuclear Safety Culture Assessment. At that meeting, USEC identified the Employee Concerns Program (ECP) and Corrective Action Program as areas that warranted attention.

Management meetings between the NRC and USEC were also conducted on January 25, 1999, and October 18, 2000, to discuss USEC's continued efforts to

assess and improve the Nuclear Safety Culture. At the October 2000 management meeting, USEC noted that the ECP was “rated as “nominally less-than-adequate” with a steady trend.”

As a result, the NRC made a decision to perform a status review of the ECP and improvement initiatives undertaken by USEC. In addition, this inspection was also conducted as a follow-up to EA-98-012.

The inspectors discussed with plant management, including the Regulatory Affairs Director and General Manager, the status and extent of the USEC improvement initiatives. The inspectors noted that the initiatives proposed and planned addressed the issues discussed in the October 2000 meeting and were in the process of being implemented.

C6.1 Employee Concerns Program

a. Inspection Scope (40001)

The inspectors reviewed the following aspects of the ECP: the timely completion of investigations for concerns received, trends of concerns entered into the program, and initiatives taken and planned to improve the program. The inspectors also sampled investigations to determine the thoroughness of the investigation; whether the investigation was completed in accordance with the program procedure; whether the program provided the results of the investigation to the initiator, if applicable; and if the technical content of the investigation was captured in other reporting requirements, if applicable.

Due to the proprietary nature of the specific content of the investigations, the inspection observations are not discussed in detail. The inspectors reviewed the following procedure:

- UE2-HR-EO1035, “Employee Concerns,” Revision 2.

b. Observations and Findings

The inspectors discussed the ECP structure and implementation with the ECP Manager. The inspectors noted that the ECP Manager reported directly to the General Manager onsite and had sufficient access to quickly address safety significant issues in a timely manner.

A review of performance indicators compiled for the ECP revealed that investigations were generally completed in accordance with the goals established in the program procedure. In addition, the inspectors noted that an action plan was developed and was being implemented to improve the effectiveness of the ECP. Items in the action plan which were already scheduled to be completed, had been successfully completed in a timely manner. However, numerous improvement actions remained open.

The inspectors also reviewed a sample of seven completed non-anonymous ECP investigations of nuclear safety issues. The inspectors noted that only a small percentage of concerns entered into the ECP program were nuclear safety related issues. In addition, the inspectors concluded that the investigations reviewed were comprehensive based on the concerns and facts provided. In general, the inspectors

noted that the files were well documented, and that the cases were handled in accordance with Procedure UE2-HR-EO1035, "Employee Concerns."

However, the inspectors did observe that for the concerns entered into the program through the exit interview process, the response to the concerned individual upon completion of the investigation was not performed as prescribed in Section 6.5 of Procedure UE2-HR-EO1035. The significance of this observation was that providing an individual the results of an investigation allows an opportunity for the individual to provide additional information to the investigators, if necessary. This also assures the correct issue was investigated. The certificatee documented this observation in ATRC-01-3995. The inspectors will track resolution of this observation as an Inspection Follow-up Item. **(IFI 070-07001/2001-007-04a)** At the end of the inspection period, responses were sent to the subject individuals.

The inspectors also noted, based on reviews of the NRC and USEC meeting minutes from June 1998 and October 2000, that the visibility of the ECP was an area where improvement was warranted. In addition, discussions with plant management indicated an intent to make the program highly visible. However, during routine tours and daily activities, the inspectors observed that the day-to-day visibility of the ECP was low. This was evidenced by the following: ECP posters and postings did not appear to be conspicuously posted around the plant - posters were not observed in main entrances to the plant and process buildings; outdated ECP posters and postings were observed in the administrative and process buildings; no information concerning the ECP was published in the plant daily newspaper; and approximately 60 percent of the 30 employees interviewed did not know who the current ECP manager onsite was. The inspectors will track resolution of this observation as an Inspection Follow-up Item. **(IFI 070-07001/2001-007-04b)** At the end of the inspection period, efforts were undertaken to improve the visibility of the ECP.

c. Conclusions

The inspectors concluded that the certificatee had developed and was implementing improvement initiatives to address the results of the Nuclear Safety Culture assessments conducted by the certificatee. The inspectors noted that the backlog of concerns entered into the ECP was low, and that investigations were generally completed in the timeframe defined in the program procedure. In addition, a random sample of investigations were noted to be comprehensive.

One inspection follow-up item was identified regarding the observation that responses to individuals who entered concerns into the program through the exit interview process were not sent the results of the investigation. In addition, a second example of a follow-up item was identified for the observation that the day-to-day visibility of the Employee Concerns Program appeared to be low.

C6.2 Safety Conscious Work Environment

a. Inspection Scope (71152)

The inspectors interviewed a random sample of approximately 30 employees onsite from each of the functional organizations to determine awareness of the ECP and the Nuclear Safety Culture.

b. Observations and Findings

The inspectors randomly interviewed a small sample of employees onsite. Every employee interviewed was aware of the ECP. However, approximately 60 percent of the respondents were unaware of who the ECP manager was but also mentioned they knew how to communicate with that person, if needed.

Every employee participating in the discussions stated that they would raise a safety issue by either utilizing the established plant processes (discussion with supervisor, ATR, ECP) or the NRC processes for reporting safety concerns. Responses concerning the ECP and Assessment and Tracking Report processes were consistent with the certificatee's responses received during the detailed surveys of Nuclear Safety Culture.

Finally, the inspectors noted that all salaried employees who had received the Safety Conscious Work Environment refresher training were familiar with the current ECP manager.

c. Conclusions

The random sample of 30 employees interviewed by the inspectors highlighted that individuals onsite would raise a perceived safety issue by utilizing the established plant processes or NRC processes for reporting safety concerns. Responses concerning the ECP and corrective action programs were consistent with the detailed surveys performed recently by the certificatee.

C6.3 Corrective Action Program

a. Inspection Scope (71152)

The inspectors reviewed the corrective action program to determine ATR trends by discipline or work groups, long term backlog of ATR corrective actions or closure, and the feedback mechanism available to employees for initiating ATRs.

b. Observations and Findings

The inspectors reviewed corrective action program data and did not identify any anomalies associated with ATR trends by discipline or work groups. The inspectors noted that there was an established feedback mechanism available to employees who initiated ATRs. This included timely feedback on the resolution of an ATR through the use of the plant electronic mail system. In addition, employees could access the status of an ATR through the use of the plant intranet system through plant computers.

The number of open items in the certificatee's corrective action program for the month of June 2001 was as follows:

<u>Time Period</u>	<u>Number of Open Items</u>
Less than 6 months	358
6 months to 1 year	173
1 year to 2 years	136
Greater than 2 years	68

A review of corrective action program documents for June 2000 and June 1999, revealed that although the backlog numbers may have lowered slightly, there had not been a significant decrease in the number of open items greater than 6 months old. However, the inspectors also noted during a review of open issues greater than 2 years that the issues were not immediate nuclear safety concerns.

The inspectors noted a number of corrective action process improvements planned and completed as part of the action plans to address this issue. The following actions had already been taken to improve effectiveness:

- conducted a gap analysis to identify reasons why the corrective action process does not have the desired level of employee confidence and develop an action plan to improve these gaps;
- conducted individual and group discussions with plant employees to obtain input on what should be changed to make the ATR process more user friendly and meet employee expectations; and
- commitment management personnel began monitoring ATR data entry backlog on a weekly basis.

The inspectors identified that the following actions were planned for implementation:

- expedite and implement a computer application which will automatically submit work requests from an ATR when required;
- revise the corrective action program to include an automatic feedback mechanism to inform an initiator who the ATR was assigned to and when the response is due;
- develop a communication plan to highlight the advantages of the corrective action program; and
- correct time delays between the submittal of an ATR for closure and update of the database.

c. Conclusions

The inspectors determined that while the backlog of open items in the corrective action program may have been reduced slightly compared to the previous two years, there has not been a significant decrease in backlogs. In addition, the inspectors determined that feedback mechanisms available to employees who initiated ATRs were adequate and several improvements were planned to improve this area. A detailed action plan existed to improve the effectiveness of the corrective action program with many items remaining to be completed, but on schedule.

S1 Conduct of Security and Safeguards Activities

S1.1 General Inspection Scope (81820)

An inspection of security and safeguards activities was conducted on June 28, 2001, at the Science and Research Laboratory (SRL) facility (classified contractor to USEC)

located in Somerville, Massachusetts. Areas examined during the inspection covered the commitments contained in the SRL Classified Matter Plan (CMP). The inspection centered on detailed reviews of four core areas of the CMP: Physical Security (e.g., exterior locks, access control, and visitor control procedures); storage and control of classified matter (e.g., intrusion alarm system, security containers, and incoming classified mail procedures); classification (e.g., use of classified cover sheets and marking stamps); and computer security.

S1.2 Physical Security

a. Inspection Scope

The inspectors examined SRL's physical security and access control procedures to verify compliance with the requirements of the SRL CMP. The inspection included a review of exterior locks, access control, and the perimeter of the building.

b. Observations and Findings

A review of SRL's physical security posture consisted of interviews with personnel, observations of activities, tests, and review of the current CMP. The main entrance door to the SRL facility was secured by an electronic lock with key pad and equipped with alarm contacts. A closed-circuit television camera and an intercom were also present at the main entrance to allow the receptionist to view and communicate with visitors. Other doors and windows around the perimeter were also observed to be alarmed with contacts to detect unauthorized building penetrations. Inside the main entrance was a vestibule with an elevator that led to a lab area on the second floor and an office/administrative area on the third floor. There was also another key pad door off the vestibule that led to a lab area on the first floor. It should be noted that the camera, intercom and perimeter alarms were not committed to in the SRL CMP because they were not required by NRC regulations for such a facility. However, these devices were noted in this report because they enhanced the protection of classified material at SRL.

With respect to personnel identification and control practices, the inspectors noted that SRL employees were not required to wear photo-identification badges because SRL employed less than 30 individuals. NRC regulations require facilities with 30 or more employees to institute a badging program. However, the inspectors were required to sign a visitors' log and were told that a visitor badge program was being considered. Again, there was no mention of this practice in the SRL CMP. The visitors' log and possible badging program were only noted because they were enhancements that added to the protection of classified material at SRL.

The inspectors reviewed SRL's interior intrusion detection system that will be used to protect classified material stored within the "secure room." The alarm system consisted of several intrusion motion sensors and a local audible annunciator. A review of the alarm system's functional abilities is discussed in Section S1.3 of this report.

c. Conclusions

The inspectors concluded that the Science Research Laboratory staff were prepared to properly implement the physical security requirements contained in the Science Research Laboratory Classified Matter Plan.

S1.3 Storage and Control of Classified Matter

a. Inspection Scope (81820)

The inspectors examined SRL plans to store and control classified matter to verify compliance with the requirements contained in the SRL CMP. The inspection included a review of the construction features of the SRL secure room; documentation involving security containers within the secure room; classified mail procedures; and intrusion alarms.

b. Observations and Findings

Storage of classified matter at SRL will be limited to two classified security containers within the secure room and the secure room itself for open storage. While examining the secure room, the inspectors were able to confirm that the Standard Form 700's, "Security Container Information," and Standard Form 702's, "Security Container Check Sheets," for the two containers and the secure room door, were in place and ready to be executed in accordance with the commitments contained in the approved CMP. The inspectors were also able to confirm that the intrusion alarm system for the secure room was functioning properly. An alarm test was conducted during the inspection, and the private company that monitors the SRL alarm system notified the SRL Facility Security Officer (FSO) via fax that the alarm was received. It was also noted that the local audible annunciator at the secure room entrance properly activated during the alarm test as well.

With respect to SRL's handling of classified mail, the inspectors noted that the SRL receptionist who would be potentially responsible for incoming and outgoing classified mail did not possess a "Q" personnel security clearance. Since SRL will be a facility cleared to the SECRET-Restricted Data (SRD) level, the potential exists for an "L" cleared individual to gain unauthorized access to SRD material. To alleviate this possibility, the SRL staff agreed to verify that only "Q" cleared personnel will be authorized to receive classified mail.

c. Conclusions

The inspectors verified that the Science Research Laboratory staff was prepared to properly implement the storage and control of classified matter requirements contained in the Science Research Laboratory Classified Matter Plan.

S1.4 Handling of Classified Documentation

a. Inspection Scope

The inspectors examined SRL's proposed methods for classifying and marking information to verify compliance with the commitments contained in the approved CMP and appropriate Executive Order (EO). The inspectors specifically reviewed the procedures for classifying information, preparation of classified documents for transmittal, classification guidance to be used, and classified marking stamps.

b. Observations and Findings

Through discussions and observations, the inspectors confirmed that SRL was equipped with the proper document cover sheets, marking stamps, and classification guidance required for the preparation and handling of classified documents. However, the inspectors were also able to determine that the SRL FSO had not yet received authorized derivative classifiers (ADCs) training and was not familiar with the requirements of EO 12958, "Classified National Security Information." After discussing these findings with SRL and USEC staff, USEC informed the inspectors that it was their intent to initiate action to have the SRL FSO trained as an ADC as soon as possible. The inspectors also informed the SRL FSO of the location of EO 12958 on the Internet.

c. Conclusions

The inspectors verified that the Science Research Laboratory staff were in a position to properly implement the classification requirements contained in the Science Research Laboratory Classified Matter Plan provided that the Facility Security Officer completed Authorized Derivative Classifier training and became familiar with the requirements of Executive Order 12958.

S1.5 Computer Security

a. Inspection Scope

The inspectors examined SRL's proposed methods for processing classified data on designated stand-alone personal computers to verify that processed data was protected in accordance with CMP commitments.

b. Observations and Findings

The inspectors reviewed SRL's proposed Computer Security Program to verify that there were measures in place to control access to the classified stand-alone computers and protect classified data processed on them. SRL had two stand-alone microcomputer systems ready for use. The inspectors confirmed that the two systems had removable hard drives which could be stored in approved security containers within the secure room. The two systems also met the 6-inch separation requirement of classified computers from unclassified systems/equipment (e.g., telephones, FAX machines, modems, etc.). Both systems were physically located in the secure room and appear to meet the computer security requirements contained in the SRL CMP. However, the inspectors did note that both systems (i.e., CPUs [central processing unit], monitors, removable hard drives) had not yet been labeled/marked with the highest classification of the data to be processed. SRL staff assured the inspectors that proper classification labels were ready for application upon the start of the classified computing operation.

c. Conclusions

The inspectors verified that the Science Research Laboratory staff was prepared to properly implement the computer security requirements contained in the Science Research Laboratory Classified Matter Plan.

S8 Miscellaneous Security Issues

S8.1 Certificatee Security Reports (90712)

The certificatee identified the following security-related 24-hour loggable report pursuant to 10 CFR 95 during the inspection period. The inspectors reviewed any immediate security concerns associated with the report at the time of the initial verbal notification.

<u>Date</u>	<u>Title</u>
8/13/01	Classified information inadvertently transmitted via electronic mail to another employee.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the routine resident inspection results to members of the facility management on August 21, 2001. In addition, the security inspectors presented the security inspection results to members of the SRL and USEC staff at the conclusion of the inspection on June 28, 2001. The facility staff acknowledged the findings presented and indicated concurrence with the facts, as stated. The inspectors asked the certificatee 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

- * M. Buckner, Operations Manager
- * A. Canterbury, Maintenance
- * S. Cowne, Nuclear Regulatory Affairs
 - G. Duncan, Paducah Locksmith
 - K. Edwards, Site Classification Officer
 - J. Feezor, FOCI Coordinator
 - T. Grace, Badging Coordinator and Protective Force Officer
- * S. Gunn, Operations
- * E. Hickman, Health Physics and Industrial Health Manager
 - G. Hoffman, Engineer for Process Technology, USEC
- * P. Jenny, Plant Services Manager
- * J. Labarraque, Nuclear Safety and Quality
- * J. McKinney, Engineering
- * D. Page, Operations
- * S. Penrod, Enrichment Manager
- * H. Pulley, General Manager
- * S. Scholl, Nuclear Regulatory Affairs
- * V. Shanks, Production Support
 - S. Spencer, Process Technology Section Manager
 - D. Stadler, Paducah Nuclear Regulatory Affairs
- * K. Stratemeyer, Operations
 - J. Trampe, Front Line Manager
 - B. Walker, Protective Force Officer
 - J. Watkins, Security Group Manager

* Denotes those present at the exit meeting on July 2, 2001.

INSPECTION PROCEDURES USED

- IP 40001: Employee Concerns Program
- IP 81820: Physical Protection Facility Approval and Safeguarding of National Security Information (NSI) and Restricted Data (RD)
- IP 83822: Radiation Protection
- IP 88020: Regional Nuclear Criticality Safety
- IP 88050: Emergency Preparedness
- IP 88100: Plant Operations
- IP 88101: Configuration Control
- IP 88102: Surveillance Observations
- IP 88103: Maintenance Observations
- IP 90712: In-office Reviews of Written Reports on Non-routine Events
- IP 92709: Strike Contingency
- IP 71152: Problem Identification and Resolution

ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened</u>	<u>Type</u>	<u>Summary</u>
38182	CER	Safety System Actuation - Building C337A, Autoclave No. 2W Steam Pressure Control System Actuation
07007001/2001-007-01a,b	VIO	Failure to implement approved procedures for radiation protection and UF ₆ cylinder filling and product withdrawal operations
07007001/2001-007-02a,b	NCV	Certificatee identified failures to implement approved procedures which resulted in the loss of a nuclear criticality safety control
07007001/2001-007-03	IFI	Troubleshooting and Lifted and Landed Leads Procedure
07007001/2001-007-04a,b	IFI	Issue Concerning the feedback of Employee Concern Program Investigations to individuals submitting issues through exit interviews, as required by procedure; Day-to-day Visibility of the Employee Concerns Program onsite
<u>Closed</u>		
38088	CER	Loss of power to Building C-333 CAAS beacons
07007001/2001-007-01a,b	VIO	Failure to implement approved procedures for radiation protection and UF ₆ cylinder filling and product withdrawal operations
07007001/2001-007-02a,b	NCV	Certificatee identified failures to implement approved procedures which resulted in the loss of a nuclear criticality safety control
<u>Discussed</u>		
None		

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ADC	Authorized Derivative Classifier
ATR(s)	Assessment and Tracking Report(s)
CER	Certificate Event Report
CFR	Code of Federal Regulations
CMP	Classified Matter Plan
CRD	CONFIDENTIAL-Restricted Data
CPU	Central Processing Unit
DNMS	Division of Nuclear Material Safety
DOE	Department of Energy
ECP	Employee Concerns Program
EO	Executive Order
FLM	Front Line Manager
FSO	Facility Security Officer
GDP	Gaseous Diffusion Plant
HP	Health Physics
NCS	Nuclear Criticality Safety
NCV	Non-Cited Violation
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
PACE	Paper, Allied-Industrial, Chemical and Energy Workers International
PARS	Publicly Available Records
RCW	Recirculating Cooling Water
SAR	Safety Analysis Report
SRD	SECRET-Restricted Data
SRL	Science Research Laboratory
TSR	Technical Safety Requirement
UF ₆	Uranium Hexafluoride
USEC	United States Enrichment Corporation