NRC FORM 591FF PART 1
(12-2007)
10 CFR 2.201

U.S. NUCLEAR REGULATORY COMMISSION

INSPECTION REPORT

1. LICENSEE OR CERTIFICATE HOLDER/LOCATION INSPECTED:	2. NRC/REGIONAL OFFICE:
United States Enrichment Corporation 6903 Rockledge Road Bethesda, MD 20817 REPORT NO: 2009.001	U.S. Nuclear Regulatory Commission Region II 61 Forsyth Street, Suite 23T85 Atlanta, GA 30303-8931

3. DOCKET NUMBER:	4. LICENSE OR CERTIFICATE NUMBER:	5. DATE(S) OF INSPECTION:
70-7001	GDP-1	January 1, 2009 – March 31, 2009

LICENSEE OR CERTIFICATE HOLDER:

The inspection was an examination of the activities conducted under your license or certificate as they relate to safety and/or safeguards and to compliance with the Nuclear Regulatory Commission (NRC) rules and regulations and the conditions of your license or certificate. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. The inspection findings are as follows:

☐ 1. Based on the inspection findings, no violations were identified.

☐ 2. Previous violation(s) closed.

☑ 3. Reported events reviewed

☐ 4. The violation(s), specifically described to you by the inspector as non-cited violations, are not being cited because they were self-identified, non-repetitive, and corrective action was or is being taken, and the remaining criteria in the NRC Enforcement Policy, to exercise discretion, were satisfied.
Non-Cited Violation(s) was/were discussed involving the following requirement(s) and Corrective Action(s):

(See Part 2)

☑ 5. During this inspection, certain of your activities, as described below and/or attached, were in violation of NRC requirements and are being cited. This form is a NOTICE OF VIOLATION, which may be subject to posting in accordance with 10 CFR 19.11.
(Violations and Corrective Actions)

(See Part 2)

LICENSEE OR CERTIFICATE HOLDER STATEMENT OF CORRECTIVE ACTIONS FOR ITEM 5, ABOVE

I hereby state that, within 30 days, the actions described by me to the inspector will be taken to correct the violation(s) identified. This statement of corrective actions is made in accordance with the requirements of 10 CFR 2.201 (corrective steps already taken, corrective steps which will be taken, date when full compliance will be achieved). I understand that no further written response to the NRC will be required, unless specifically requested.

Title	Printed Name	Signature	Date
LICENSEE/CERTIFICATE HOLDER REPRESENTATIVE			
NRC INSPECTOR	Michael O. Miller	***/RA/ J. Pelchat for***	***5/14/09***

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6. INSPECTOR(S): Chad Cramer, Michael Miller, and Mark Chitty

7. INSPECTION PROCEDURES USED: 88020, 88100, 88102, 88103, 88105

EXECUTIVE SUMMARY

Summary of Plant Status

- The certificate holder performed routine operations throughout the inspection period. Power was lowered on January 27 because of an ice storm and was restored on February 17 where it remained through the end of the inspection period.

Plant Operations (88100 and 88020)

- The inspectors observed routine operations during this inspection period in the enrichment cascade facilities, product and tails withdrawal facilities, and the UF_6 feed facilities. The inspectors assessed operations personnel alertness and general knowledge of equipment status associated with their assigned facilities. The inspectors conducted interviews with operators regarding procedures for reporting safety issues to management.

- On January 14, 2009, at approximately 10 p.m. the inspector was notified that the Emergency Response Organization (ERO) was being activated and the Emergency Response Center (EOC) was being manned (Event Number: 44776). The inspector responded to the scene at the C-337A building (feed building). The inspector found that the C-337A operators saw a white cloud forming around the autoclaves. The operators fled the area as required by procedure and notified management. Management made the decision to activate the ERO even though no Emergency Action Level in the emergency plan required activation of the EOC to bring technical expertise to bear on the event. The operators donned respirators and appropriate PPE and returned to the C-337A building. The operators shutdown the autoclaves in the C-337A building and approached the white cloud to identify the source. They found that the white cloud was a steam/water vapor mixture that resulted from a water leak in the south end of a trench that was wetting steam pipes. Samples taken for HF, an indicator used to detect a UF_6 release, were negative. The ERO stood down at 2:20 a.m., on January 15, 2009.

  The inspector evaluated:
  - ERO readiness and response during a real-time performance based activation.
  - Facility and equipment readiness for an unannounced and non-drill EOC activation.
  - Compliance with the Emergency Plan.
  - The Plant Shift Superintendent's actions to determine whether response to this event would cause interference with ongoing plant operations.

- The inspectors conducted a quarterly detailed walkdown of a representative sample of a selected safety system. The selected safety system was the criticality accident alarm system (CAAS). The inspectors reviewed CAAS operational data as maintained by the system engineer. The inspectors interviewed the system engineer, plant shift superintendent, area control room operators, regulatory compliance manager, and instrument mechanics. The inspector walked down the CAAS air supply systems, power supply, support systems, detector/logic modules, and the horns in Buildings C-333, C-333A, C-409, and C-335.

- On January 27, 2009, the plant was subjected to a major ice storm that produced subzero conditions and that disrupted power lines, telephone phone lines, and cellular communication towers. Most major and secondary roads were blocked by fallen trees and branches, complicating travel to the facility by certificate holder and NRC resident personnel. The Senior Resident Inspector arrived on-site to assess plant conditions and plant response. The inspector communicated plant status with Region II offices using a satellite phone. No other lines of communication were available. The inspector found that the emergency operations center had been activated with minimal staffing including the senior management Team, but most of the emergency response organization was not present and could not be notified due to the loss of communication lines. Since some site staff was unable to get to the site, the certificate-holder set up cots and a duty rotation to allow on-site personnel to rest.

  One facility (building C-333) lost all offsite power due to 161Kv off-site supply lines failing as a result of the ice. The facility was placed in a safe condition and a re-start plan was developed. As plant staff members arrived, on-duty personnel were relieved, and a systematic restoration of C-333 operations was commenced.

- The inspectors discovered a leaking steam pipe flange in the enrichment cascade facility during a walkdown. The inspectors reported it to the certificate holder and it was properly recorded and tracked in an Assessment and Tracking Report (ATR). Also, during a walkdown, the inspectors observed the replacement of a converter in an enrichment cascade facility.

- The inspectors reviewed piping and instrumentation diagrams and TSRs for the product withdrawal and UF_6 feed facility. System walk-downs were then performed in these facilities. The inspectors discussed procedures relating to TSRs and valve alignment with operators in the product withdrawal facility and UF_6 feed facility.

No violations of significance were identified.

Surveillance and Maintenance Observations (88102 and 88103)

- During the observation of maintenance and surveillance activities, the inspectors verified that: activities observed were performed in a safe manner; testing was performed in accordance with procedures; measuring and test equipment was within calibration; TSR limiting conditions for operations were entered, when appropriate; removal and restoration of the affected components were properly accomplished; test and acceptance criteria were clear and conformed with the TSR and the safety analysis report; and deficiencies or out-of-tolerance values identified during the testing were documented, reviewed, and resolved by appropriate management personnel.

- The inspectors observed an annual surveillance relating to the criticality accident alarm system (CAAS). During this surveillance, technicians replaced a CAAS detector. The inspectors noted that the CAAS detector was replaced in accordance with approved procedures.

No violations of significance were identified.

Management Organization and Controls (88105)

- The inspectors reviewed facility staffing to verify that administrative controls had been established and implemented to ensure minimum staffing levels and to control the amount of overtime (OT) as specified in the Technical Safety Requirement (TSR). The inspectors interviewed members of the plant staff including: 1) Managers, 2) Plant Shift Superintendents, 3) Shift Operations Manager, 4) Operators, 5) Security Guards and, 6) Front Line Managers. The inspectors conducted in-office reviews of the following documents:

    1. TSR 3.2.2.b,"Facility Staff"
    2. Shift schedule for 2008
    3. OT worked computer reports for operators and security guards in 2008
    4. Authorized OT exceedences (and their respective justifications) for operators, security guards, and maintenance personnel in 2008
    5. Procedure CP2-HR-LR1030, "Limitations on Hours of Work for TSR Personnel," Revision 2
    6. Thirteen OT Assessment and Tracking Reports (ATR) initiated as a result of human errors
    7. Quality Assurance Surveillance, KP-OP-S06033, "Shift Operations (Companion Surveillance)," dated December 14, 2006

  During the week of January 5, 2009, the inspectors observed what appeared to be the PSS authorization of operators and security guards to exceed TSR OT limits on a routine basis. The inspectors reviewed records of OT worked by operators, security guards, and maintenance personnel during 2008. During this review the inspector determined that the PSS had authorized operators and security guards to exceed TSR OT limits each and every week in 2008 for a total of approximately 955 times. The inspectors noted that the vast majority of these approvals to exceed TSR OT limits were necessary to meet shift staffing requirements.

  The certificate-holder supplied the inspectors with a bar chart that showed that maintenance personnel were approved to exceed TSR OT limits approximately 650 times in 2008.

  The inspectors interviewed USEC management and were told the certificate holder was unable to meet minimum staffing requirements during routine operations without the use of OT in 2008. Certificate-holder representatives stated that OT was necessary during routine operations when operators were absent for training, physicals, sickness, or vacation. The inspectors noted that these are routine and foreseeable shift absences.

  In "Compliance Plan Issue 42" Revision 3, dated July 9, 1996, the NRC identified certificate-holder difficulties in meeting minimum staffing requirements as a noncompliance and that the staffing allocations were not sufficient to meet training needs and comply with working hour guidelines. Part of the justification for continued operation was that first line supervisors would ensure OT was not excessive and programs would be used to detect and minimize any adverse effects of excessive OT.

  NRC Inspection Report 0700701/2002-003 documented an "adverse trend" where the certificate-holder had not been effectively controlling approvals to exceed the TSR OT limits and stated that the certificate-holder management initiated actions to reverse the trend. There were approximately 1,260 authorizations to exceed TSR OT limits in 2002.

  The inspectors interviewed several operators and supervisors and reviewed of a sample of 13 Assessment & Tracking Report (ATR) Program entries that involved human-errors in 2008 to determine if OT was a factor. The inspectors found that 5 of the 13 ATRs indicated that the involved employee

was on overtime. None of the ATRs reviewed or personnel interviewed stated OT-induced fatigue was a cause of human-errors. Two of the documented human-errors resulted in nuclear criticality safety violations and one resulted in a 24-hour report to NRC headquarters operations officer. One of these human errors was made while approval to exceed TSR OT limits was active. The inspectors concluded that OT was a factor in some human-errors that occurred in 2008.

The certificate-holder conducted their own investigation to determine if any significant human errors occurred while authorized to exceed TSR OT limits since 2005. The certificate-holder found one significant human error made while approval to exceed TSR OT limits was active in 2005 (ATRC-05-4073). The ATR did not specifically state that OT induced fatigue was a cause of this human error.

Section 5.7 of USEC human resources Procedure CP2-HR-LR1030, "Limitations on Hours of Work for TSR Personnel," states that each certificate-holder employee is responsible for informing his/her immediate manager before he/she exceeds any established hours of work limitation. Section 6.1 further states that if an If employee determines he or she could violate the hours of work limitations by accepting the overtime assignment, the employee is responsible to inform their immediate manager or the individual offering the overtime assignment of his or her ineligibility. The inspectors questioned a cross-section of TSR workers and determined that most of those questioned were unfamiliar with one or more of the TSR hours of work limits that they are required to know. This finding was also documented in a Quality Assurance Surveillance, KP-OP-S06033, "Shift Operations (Companion Surveillance)," conducted by the certificate holder and dated December 14, 2006. The inspectors noted that when the TSR workers were questioned, they worked together to find the TSR hours of work limits and were able to locate that information quickly. The inspectors concluded that some of the human-errors made in 2008 were made while the individual was working overtime.

The resident inspectors attended the certificate-holder's weekly human performance error review meetings in 2008 and noted that the use of OT had not been discussed during these weekly reviews.

10 CFR 76.87 requires, in part, that the Corporation establish technical safety requirements in Operations and Maintenance and that technical safety requirements must include safety limits, limiting control settings, limiting conditions for operation, design features, surveillance requirements, and administrative controls. TSR 3.2.2.b,"Facility Staff," states, in part, that "Adequate shift coverage shall be maintained without routine heavy use of overtime. The objective shall be to have personnel work an 8-hour or 12-hour workday [i.e., a nominal 40 hour (can be as much as 48 hours) work week]. . . . Any deviation from the above guidelines shall be authorized in advance by the General Manager or his designee. Routine deviation from the above guidelines is not authorized."

The inspectors determined that the PSS routinely deviated from TSR 3.2.2.b when he authorized operators, security guards, and maintenance personnel to exceed the OT limits of TSR 3.2.2.b each and every week in 2008. Specifically, the PSS approved operators to exceed the OT limits approximately 682 times in 2008. The PSS approved security to exceed the OT limits approximately 273 times in 2008. The PSS approved maintenance to exceed the OT limits approximately 650 times in 2008. This resulted in routine deviation from TSR 3.2.2.b. This NRC-identified finding was a cited violation (NOV 07007001/2009-001-01).

Exit Meeting Summary

- The inspection scope and results were summarized on April 7, 2009, with Steve Penrod, and members of his staff. The inspectors asked the certificate holder staff whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

Licensee Performance Review

- On January 12, 2009, the NRC's Chief of Division of Fuel Facility Inspection Branch 2, Region II Public Affairs Officer, and the Resident staff assigned to the Paducah Gaseous Diffusion Plant (PGDP) met with United States Enrichment Corporation (USEC) managers to discuss the NRC's Oversight Process and the PGDP biennial assessment of safety performance for the period from October 4, 2006 through October 3, 2008. The major topics addressed were: the NRC's assessment program, the results of the PGDP assessment, and future NRC inspection activities. Attendees included USEC Management. Members of the public attended. This meeting was open to the public. The NRC's presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML083460003 accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Key Points of Contact

Name	Title
Steve Penrod	General Manager
Jim Lewis	Plant Manager
Jim Wittman	Maintenance Manager
Sherrill Gunn	Operations Manager
Robert Helme	Engineering Manager
Keith Ahern	Production Support
David Clayton	Training Manager
Vernon Shanks	Regulatory Affairs Manager
April Tilford	Emergency Management

List of Items Opened, Closed, Discussed

Item Number	Status	Description
43828 CER	Related to 43829 Closed	UNPLANNED SAFETY SYSTEM ACTUATION AND CONTAMINATION EVENT On December 6, 2007 the PGLD head in the C-337 unit 5 cell 3 housing actuated and would not clear. Operators observed a haze above the cell indicating a UF6 release inside the cell housing. While the operators were responding, two other PGLD heads actuated in C-337 unit 5 cell 5. To stop the release, both cells 3 and 5 were taken below atmospheric pressure. PGDP: ATRC-07-3264, 3265, 3266; Action ID: C08I00344; ER-07-10 The certificate holder determined that the direct cause of the event was due to failure of the unit 5 cell 5 B-outlet balanced elbow expansion joint. The leak was repaired and the system returned to operation. The certificate holder performed root cause and extent-of-condition investigations and implemented corrective actions. Due to the extent of the corrective actions, they will not be listed in this report, but can be referenced in the PGDP documents listed above. The inspectors had no further questions. This event report is closed.
43829 CER	Related to 43828 Closed	UNPLANNED SAFETY SYSTEM ACTUATION AND CONTAMINATION EVENT On December 6, 2007 the PGLD head in the C-337 unit 5 cell 3 housing actuated and would not clear. Operators observed a haze above the cell indicating a UF6 release inside the cell housing. While the operators were responding, two other PGLD heads actuated in C-337 unit 5 cell 5. To stop the release, both cells 3 and 5 were taken below atmospheric pressure. PGDP: ATRC-07-3264, 3265, 3266 The certificate holder determined that the direct cause of the event was due to failure of the unit 5 cell 5 B-outlet balanced elbow expansion joint. The leak was repaired and the system returned to operation. The certificate holder performed root cause and extent-of-condition investigations and implemented corrective actions. Due to the extent of the corrective actions, they will not be listed in this report, but can be referenced in the PGDP documents listed above. The inspectors had no further questions. This event report is closed.
44100 CER	Closed	DEGRADED CRITICALITY CONTROL In C-337 Unit 3 Cell 10 Stage 2 converter, the pre-removal NDA inspection was improperly performed resulting in a violation of NCSA GEN-10. PGDP: ATRC-08-0906 and PAD-2008-08 Inspectors reviewed this issue under NCS inspection report 70-7001/2008-203 dated August 21, 2008. The inspectors identified no safety concerns regarding the certificate holder's evaluation and correction of this event. This event report is closed.

44223 CER	Closed	VIOLATION OF A NUCLEAR CRITICALITY SAFETY APPROVAL On April 17, 2008, a portion of the coolant system was evacuated using an R-114 evacuation pump. The recirculating cooling water (RCW) condenser for the affected cell had not been disconnected or vented before evacuation of coolant system vapor or air, in violation of NCSA CAS-21 Rev. 01, 'Operation and Shutdown of the Diffusion Cascade,' Control 3.2.3. That control states: 'The RCW condenser shall be disconnected or vented before coolant vapor is evacuated.' Coolant system leak rate testing results were logged as of 2100 hours on 5-18-08 showing the coolant system to be evacuated to 30" vacuum and holding. At that pressure the system would be below the vapor pressure of water. Therefore, the coolant system being evacuated to that level and holding would indicate that no liquid water was present in the coolant system. The system being evacuated and holding proves that not only was the condenser free of any significant RCW to coolant leaks, but the process gas cooler was also essentially leak-tight. PGDP: ATRC-08-1471, ATRC-08-1019, and PAD-2008-18 Inspectors reviewed this issue under NCS inspection report 70-7001/2008-203 dated August 21, 2008. The inspectors identified no safety concerns regarding the certificate holder's evaluation and correction of this event. This event report is closed.
44515 CER	Closed	SAFETY EQUIPMENT FAILURE DUE TO LOSS OF POWER On September 23, 2008, building C-315, the tails withdrawal facility, lost power due to a fault on a 14 KV feeder. As a result of the power loss, the C-315 High Voltage Process Gas Leak Detection (PGLD) System was rendered inoperable. This PGLD System contains detectors that cover the C-315 UF6 condensers, accumulators, and piping heated housing. At the time of this loss of power, these areas were operating above atmospheric pressure. TSR 2.3.4.4 requires that all of detector heads in this system be operable during operations above atmospheric pressure. This PGLD System was declared inoperable. TSR LCO 2.3.4.4.A.1 was entered and a continuous smoke watch was put in place within one hour. Once the source of the fault was identified, power was restored to the C-315 facility. The High Voltage PGLD system was tested, and the system was declared operable. PGDP: ATRC-08-2736 and 2731 and PAD-2008-29 The certificate holder repaired the water leak and has implemented a procedure change to increase the reliability of electrical power. The inspectors had no further questions. This event report is closed.

44705 CER	Closed	PROCESS GAS LEAK DETECTION SYSTEM Failure On December 8, 2008, Building C-333 Unit 6 Cell 5 Process Gas Leak Detection (PGLD) System would not test fire during routine testing. PGDP: ATRC-08-3434 and PAD-2008-036 The certificate holder determined that the K1 relay coil installed on the logic control circuit module failed. The K1 relay is energized at all times when the system is in the manual mode (the normal mode of operation). The K1 relay allows manual test firing of the heads. The failure of the K1 relay interrupted power to the test firing and PGLD ACR alarm circuits. The certificate holder determined this was an end-of-life component failure. The inspectors had no further questions. This event report is closed.
44776 CER	Open and Closed	ONGOING RECIRCULATING COOLING WATER LEAK AT C337A FACILITY On January 14, 2009, the plant identified a recirculating cooling water (RCW) leak under the concrete floor of the C337A autoclave facility. Operators in the building pulled the manual isolation shutdown, placing the facility in a stable condition. Plant personnel determined the overall impact to the plant was minimal and subsequently resumed process operations in the cascade facility. The leak was not isolated but was localized. PGDP: ATRC-09-0101 The RCW leak was repaired and the RCW system returned to service. Affected systems were subsequently repaired, tested, and returned to service. The inspectors had no further questions. This event report is closed.
44819 CER	Open	24 HOUR REPORT OF PROCESS GAS LEAK DETECTION SYSTEM INOPERABILITY On January 30, 2009, the C-310 (product withdrawal facility) lost power due to an electrical fault. As a result of the power loss, the C-310 High Voltage Process Gas Leak Detection (PGLD) System was rendered inoperable. Once the source of the fault was identified, power was restored and the C-310 the High Voltage PGLD system was tested satisfactorily. PGDP: ATRC-09-0201, ER-09-01 The certificate holder determined electrical power was lost due to a failure of the pilot wire trip function to trip the 2PPA3T transformer secondary breaker (TSB) in response to a large electrical transient caused by a major ice storm. The certificate holder determined to postpone testing necessary to confirm the failure of the pilot wire trip until the plant's summer low power period.

44820 CER	Open	LOSS OF POWER TO CRITICALITY ACCIDENT ALARM SYSTEM HORN On January 31, 2009, power was lost to the C-409 (Stabilization Building) CAAS horns. This event occurred while activities were underway to determine the cause of a C-409 CAAS trouble alarm that had been received about two hours earlier. Plant personnel discovered that a circuit breaker had tripped causing a loss of power to the CAAS horn uninterruptible power supply (UPS). An I&C mechanic investigating the cause for the trouble alarm pushed the “on/standby” switch on the UPS which caused the loss of CAAS audibility. The circuit breaker that tripped was closed and the UPS was turned back on. This is a repeat event (see PGDP ER-02-03). PGDP: ATRC-09-0203; ER-09-02
URI-01	Open	On March 6, 2009, inspectors found a member of the security force who appeared to be in violation of several plant procedures. This finding remains under NRC review