



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

August 13, 2012

EN 47911  
EN 48022

Mr. Robert Van Namen  
Senior Vice President, Uranium Enrichment  
United States Enrichment Corporation  
Two Democracy Center  
6903 Rockledge Drive  
Bethesda, MD 20817

**SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 70-7001/2012-003 AND  
NOTICE OF VIOLATION**

Dear Mr. Van Namen:

This letter refers to the results of the above-referenced Nuclear Regulatory Commission (NRC) inspections conducted at your Paducah facility from April 1 through June 30, 2012. The purpose of the inspections was to determine whether activities authorized by the certificate were conducted safely and in accordance with NRC requirements. The NRC inspectors discussed the inspection findings with members of your staff during exit meetings held on May 24, 2012, July 11, 2012, and July 26, 2012.

The inspections were an examination of activities conducted under your certificate of compliance as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your certificate. Areas examined during the inspections are identified in the enclosed report. Within these areas, the inspections consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of these inspections, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. The violation involved operators' failure to follow procedures while performing overhead crane cylinder handling operations. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is available on the NRC's Web site at [www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html](http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html). The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding the occurrences are described in the subject inspection report.

If you contest the violation or the significance, 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 II, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration in presenting the corrective actions, the guidance from NRC Information Notice 96-28, Suggested Guidance Relating to Development and Implementation of Corrective Action, is available on the NRC website and may be helpful. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact me at (404) 997-4418.

Sincerely,

**/RA/**

Joselito O. Calle, Chief  
Fuel Facility Inspection Branch 2  
Division of Fuel Facility Inspection

Docket No. 70-7001  
Certificate No. GDP-1

Enclosures:

1. Notice of Violation
2. NRC Integrated Inspection Report  
No. 70-7001/2012-003  
w/Attachment: Supplemental Information

cc w/encls: (See page 3)

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X PUBLICLY AVAILABLE      ☐ NON-PUBLICLY AVAILABLE      ☐ SENSITIVE      X NON-SENSITIVE  
ADAMS: X Yes      ACCESSION NUMBER: ML12227A343      X SUNSI REVIEW COMPLETE X FORM 665 ATTACHED

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI	RII:DFFI
SIGNATURE	/RA/		/RA/	/RA/	/RA/	/RA/	/RA/
NAME	RRussell	MChitty	MCrespo	DHartland	NPitoniak	MToth	JDiaz
DATE	8/7/2012		8/7/2012	8/7/2012	8/7/2012	8/7/2012	8/7/2012
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY      DOCUMENT NAME: G:\DFFI\REPORTS\FINAL REPORTS\IPADUCAH\2012\IPADUCAH GDP  
REPORT 2012-003-\_\_\_REFORMATTED AND WED WORK\_\_\_(4).DOCX

cc w/encls:

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Letter to Mr. Robert Van Namen from Joselito O. Calle dated August 13, 2012

SUBJECT: NRC INTEGRATED INSPECTION REPORT NO. 70-7001/2012-003 AND  
NOTICE OF VIOLATION

Distribution w/encls:

PUBLIC

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T. Liu, NMSS

J. Calle, RII

J. Díaz, RII

M. Chitty, RII

M. Crespo, RII

D. Hartland, RII

R. Russell, RII

## NOTICE OF VIOLATION

United States Enrichment Corporation-PGDP  
Paducah, Kentucky

Docket No. 70-7001  
Certificate No. GDP-1

During an NRC inspection conducted from April 1 through June 30, 2011, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 76.93 requires, in part, that the certificate holder establish, maintain, and execute a quality assurance program satisfying each of the applicable requirements of The American Society of Mechanical Engineers (ASME) NQA-1-1989, "Quality Assurance Program Requirements for Nuclear Facilities," or satisfying acceptable alternatives to the applicable requirements; and that the certificate holder execute the criteria in a graded approach to an extent that is commensurate with the importance to safety.

ASME NQA-1-1989, section II, "Basic Requirements," paragraph 2, "Quality Assurance Program," requires that a documented quality assurance program be planned, implemented, and maintained in accordance with this Standard, or portions thereof.

The certificate holder's quality assurance program states, in part, that a quality assurance program has been established to achieve the required level of safety and quality, and that it has been established in a graded, three-category program with the level of quality designation of "Q" as important to safety.

Section 3.15 of the certificate holder's Safety Analysis Report, "Safety System Classification," and in Table 3.15-1, "Boundary Definition for Q Structures, Systems, and Components," has identified the UF<sub>6</sub> cylinder handling cranes and the UF<sub>6</sub> cylinders as "Q" systems and components.

The certificate holder's quality assurance program states, in part, activities affecting quality are prescribed in documented procedures and "Q" activities are performed in accordance with documented work procedures.

Procedure CP2-CO-CA2031, "Operation Of Overhead Cranes," Step 8.17.5, directs the operator to ensure the load does not contact any obstructions, and Step 8.17.10, directs the operator to ensure the path is clear from obstructions when moving liquid filled UF<sub>6</sub> cylinders.

Contrary to the above, the crane operators failed to follow procedures when conducting overhead crane operations while handling and in the area of liquid-filled uranium hexafluoride cylinders. Specifically, on May 27, 2012, in Building C-315, the operators struck a stationary cylinder while moving a solid cylinder from the liquid-filled cylinder cool down area and on December 18, 2011 and on February 7, 2012, in Building C-360, the operators struck the building overhead garage door while conducting liquid-filled cylinder movement. The operators failed to ensure the load did not contact any obstructions and failed to ensure the path was clear from obstructions. (Violation (VIO) 70-7001/2012-003-01)

This is a Severity Level (SL) IV Violation (NRC Enforcement Policy, Section 6.2.d.2).

Pursuant to the provisions of 10 CFR 76.70, the United States Enrichment Corporation, Paducah Gaseous Diffusion Plant is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region II, and a copy to the NRC Senior Resident Inspector at the Paducah Gaseous Diffusion Plant within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation, and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved.

Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the certificate of compliance should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

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.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> to the extent possible, it should not include any personal privacy, proprietary, classified, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

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

Dated at Atlanta, Georgia this 13<sup>th</sup> day of August, 2012

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 70-7001

Certificate No.: GDP-1

Report No.: 70-7001/2012-003

Licensee: United States Enrichment Corporation

Facility: Paducah Gaseous Diffusion Plant

Location: Kevil, KY 42053

Dates: April 1 through June 30, 2012

Inspectors: M. Chitty, Acting Senior Resident Inspector  
M. Crespo, Acting Senior Resident Inspector  
D. Hartland, Senior Fuel Facility Inspector  
N. Pitoniak, Fuel Facility Inspector (In-training)  
R. Russell, Resident Inspector  
M. Toth, Fuel Facility Inspector

Approved by: J. Calle, Chief  
Fuel Facility Inspection Branch 2  
Division of Fuel Facility Inspection



## **EXECUTIVE SUMMARY**

United States Enrichment Corporation  
Paducah NRC 2011 2nd Quarter Integrated Inspection Report 70-7001/2012-003  
April 1 – June 30, 2012

U.S. Nuclear Regulatory Commission (NRC) resident inspectors conducted inspections at the Paducah Gaseous Diffusion Plant during normal and off normal shifts in the areas of plant operations, maintenance and surveillance, plant modifications, and management and controls. The inspectors performed a selective examination of activities which was accomplished by direct observation of safety-significant activities and equipment, tours of the facilities, interviews and discussions with personnel, independent verification of safety system status and limiting operation conditions, corrective actions, and a review of facility records. The NRC's program for overseeing the safe operation of uranium enrichment facilities is described in Manual Chapter 2600, "Fuel Cycle Facility Operational Safety and Safeguards Inspection Program," dated January 27, 2010.

### **Safety Operations**

- Management controls were effective in achieving continued safe operation of the facility. (Paragraph A.1)
- The facility operated safely and in accordance with regulations, certificate, the Safety Analysis Report (SAR), and certificate holder policies and procedures, with the exception of the finding described in Paragraph C.2 of the enclosed report. (Paragraphs A.1 and A.2)
- The material condition and "as-found" configuration of the site, structures, and equipment, conformed to the certificate requirements and were appropriate to protect worker and public safety during normal, off-normal, and possible accident conditions. (Paragraph A.2)
- Safety controls over the facility and process operations that affect certificated material were effectively implemented. (Paragraph A.2)

### **Facility Support**

- The facility developed, implemented, and maintained an appropriate configuration control program. The facility properly processed facility design changes and modifications. (Paragraph B.1)
- The facility developed, implemented, and maintained programs for the control and evaluation of surveillance testing, calibration, and inspections required by the Technical Safety Requirements (TSRs), nuclear criticality safety evaluations/approvals (NCSEs/As), and other applicable programs, including the calibration of "Q" and "NCS-AQ" safety related instrumentation not specifically controlled by TSRs. (Paragraph B.2)
- The surveillance of safety significant systems and components reviewed was conducted in accordance with TSRs, NCSEs/As, and other requirements. (Paragraph B.2)
- The facility implemented a program to ensure that maintenance activities were performed in conformance with TSRs, regulatory requirements, commitments in the application, and industry codes and standards. (Paragraph B.3)

- Maintenance activities for "Q," "AQ," and other safety significant structures, systems, and components (SSCs) were conducted in a manner that resulted in reliable safe operation of the plant and plant equipment. (Paragraph B.3)
- The organizational structure, the qualifications of personnel, and assignment of responsibilities and authorities, were found in conformance with the certificate requirements. (Paragraph B.4)
- Plant procedures, including temporary procedures, were maintained, reviewed, and/or changed in accordance with the certificate requirements. (Paragraph B.4)
- Internal reviews and audits were performed to assess the effectiveness of activities affecting safety. (Paragraph B.4)
- Plant operations review committees reviewed activities important to safety and provided management with recommendations for continued safe plant operations. (Paragraph B.4)
- The facility established a quality assurance program to ensure the quality of equipment and systems important to safety, including "Q" and "AQ" systems and components. (Paragraph B.4)
- The certificate holder implemented the configuration management system to evaluate, implement, and track each permanent plant modification that could affect safety. (Paragraph B.5)
- The certificate holder's configuration management system ensured that permanent plant modifications did not degrade the performance capabilities of items relied on for safety. (Paragraph B.5)
- The design modifications reviewed were properly implemented, and in accordance with the certificate holder's design change process. (Paragraph B.5)

### **Special Topics**

- Two events were reviewed and a violation of minor safety significance (not subject to formal enforcement action) was identified. (Paragraph C.1)
- A violation of NRC requirements was identified for the failure to follow procedures for overhead crane operations while handling UF<sub>6</sub> cylinders. (Paragraph C.2)
- The NRC's review of URI 07007001/2011-004-01, Process Gas Leak Detectors (PGLD) issue continues and the issue remains open. (Paragraph C.2)

### **Attachment**

List of Persons Contacted  
 List of Documents Reviewed  
 List of Items Opened, Closed, and Discussed  
 List of Inspection Procedures Used  
 List of Acronyms Used

## REPORT DETAILS

### Summary of Plant Status

The facility was operated continuously during this inspection period and the certificate holder performed routine operations and maintenance activities safely throughout the inspection period. The operators controlled power levels and product assay according to the production schedule.

#### A. Safety Operations

##### 1. Plant Operations (Inspection Procedure (IP) 88100)

###### a. Scope and Observations

The inspectors observed routine operations in the central control facility, the cascade buildings, the feed vaporization facilities, product and tails withdrawal facilities, the toll and transfer facility, and all associated control rooms. The inspectors observed control room personnel to determine whether proper control room staffing was maintained, access to the control room was properly controlled, and operations were conducted in a manner commensurate with the plant configuration and plant activities in progress.

The inspectors examined the status of selected control room alarm indicators, instrumentation, and recorder traces to identify abnormalities and to determine the plant status. The inspectors reviewed control room and plant shift superintendent log entries, daily operating instructions, and corrective action program entries to obtain information concerning operating trends and activities.

The inspectors observed on-duty operators to verify the attentiveness in carrying out their assigned duties. The inspectors compared operator actions to approved procedures for ongoing activities and evaluated compliance with the appropriate technical safety requirements (TSRs) limiting condition for operation (LCO) action statements during abnormal conditions.

The inspectors toured portions of the cascade and uranium hexafluoride (UF<sub>6</sub>) handling areas to assess safety conditions, general plant cleanliness, and equipment status. The inspectors assessed the handling and storage of portable gas cylinders and flammable material, management of fire loads, postings and controls of radioactive material control zones and radiation areas, and implementation of criticality controls. The inspectors walked-down portions of the fire protection system to verify the correct system alignment, physical condition, and operability.

The inspectors determined all required notices to workers were appropriately and conspicuously posted in accordance with 10 CFR 19.11 and 10 CFR 21.6. The inspectors confirmed that the certificate holder met the requirement to conspicuously

post copies of NRC Form-3, "Notice to Employees," in sufficient quantities and locations to permit workers engaged in licensed activities to observe them on the way to or from any activity location as required. The inspectors reviewed the postings located in the vicinity of the normal employee access and egress locations.

b. Conclusion

No findings of significance were identified.

2. Operational Safety (IP 88020)

a. Inspection Scope and Observations

The inspectors interviewed and observed operators associated with filling and handling UF<sub>6</sub> cylinders in the toll and sampling building. The inspectors determined that the safety controls associated with cylinder filling operations with liquid UF<sub>6</sub> were adequately implemented and properly communicated as described in the Safety Analysis Report (SAR). The inspectors determined that the certificate holder was operating safely and in compliance with requirements.

The inspectors confirmed that safety controls, including cylinder handling equipment, pressure and weight indicators, and UF<sub>6</sub> leak detection equipment were present and capable of performing their intended safety functions. To complete the safety confirmation, the inspectors verified the physical presence of passive and active engineered safety controls and evaluated the safety controls to determine their capability and operability.

The inspectors observed cascade operators isolate a cell and perform a simulated loss of power evolution and determined the operators adequately implemented the required safety surveillances. The inspectors reviewed the procedures applicable to the observed tasks and determined that these procedures were current, reflected safety controls, and were followed by the operators.

The inspectors observed operators perform an annual UF<sub>6</sub> leak detection TSR surveillance on UF<sub>6</sub> detector heads in a feed facility building. The inspectors noted the operators followed surveillance procedure requirements. The inspectors verified that the smoke test met UF<sub>6</sub> equivalency criteria.

b. Conclusion

No violations of NRC requirements were identified.

B. Facility Support

1. Configuration Control (IP 88101)

a. Scope and Observations

The inspectors reviewed the adequacy and implementation of the facility's configuration control program. The inspectors determined that proposed changes

were made in accordance with approved design-change documents. The inspectors reviewed the change packages, interviewed the parties responsible for proposed changes, and walked down the implementation of the changes.

b. Conclusion

No findings of significance were identified.

2. Surveillance Observations (IP 88102)

a. Scope and Observations

The inspectors reviewed the performance of periodic surveillances required by the TSR and plant procedures to verify activities were being conducted in accordance with the administrative and safety controls. The inspectors reviewed the surveillance documentation to verify that required administrative approvals and tag-outs were obtained before test initiation. The inspectors observed portions of the conduct of the surveillance test, checked to verify testing was done by qualified personnel, reviewed test data for accuracy and completeness, and confirmed the safety systems were properly returned to service.

b. Conclusion

No findings of significance were identified.

3. Maintenance Observations (IP 88103)

a. Scope and Observations

The inspectors observed selected maintenance activities to determine if the activities were completed in accordance with approved work documents. Inspection activities consisted of observations, review of documents, and interviews of maintenance personnel. Maintenance activities were evaluated to determine if they were adequate in ensuring the reliable operation of the plant's safety systems and if activities were performed in accordance with regulatory requirements.

The inspectors evaluated if personnel were knowledgeable of the requirements contained in work packages and if they were complying with procedural requirements. The inspectors noted that acceptance criteria, where appropriate, was provided in the work packages. The inspectors reviewed completed work package documents for accuracy and completeness. The inspectors reviewed procedures associated with the preventive maintenance, surveillance testing, and work control programs. The inspectors evaluated the status of equipment and systems in the certificate holder's plant tracking system. Inspectors examined day shift and back shift maintenance activities for the various functional areas (i.e., mechanical, electrical, instrument and control). The inspectors attended pre-job briefings conducted prior to maintenance activities.

The inspectors reviewed the lock-out/tag-out (LOTO) records for selected systems to determine if there was any impact on the systems' operability status. For the

LOTOs, the inspectors confirmed that systems were properly returned to the normal configuration after the completion of maintenance. The inspectors selected safety-related LOTOs in effect and independently evaluated if they were prepared and implemented by verifying proper selection and placement of tags on breakers, switches, and valves. Additionally, the inspectors verified that tagged components were in the required positions.

The inspectors reviewed the certificate holder's program for tracking and trending maintenance activities and for maintaining equipment and component reliability. The inspector reviewed associated documentation and conducted discussions with responsible personnel. The inspectors evaluated the certificate holder's program for tracking and trending various performance indicators to monitor systems health.

The inspectors evaluated maintenance activities and work control requirements for special authorizations for activities involving welding, radiological controls, and personnel safety controls including the radiation work permits, confined space permits, hot work permits, fall hazards precautions, and other industrial hygiene permits and evaluations.

The inspectors observed maintenance activities associated with the "A to 35" converter replacement in Building C-331 using Procedure CP2-CO-CN2030, "Inspection, Removal, Installation, and Handling of Uranium Contaminated Cascade Equipment." The inspectors observed the line crawl activities and the non-destructive assay of the removed converter. The inspectors observed Quality Control (QC) inspectors at the hold points perform weld inspections using CP4-QA-QI4055, "Visual Examination of Welds and Cascade Equipment." The inspectors reviewed the permits associated with the activities and evaluated work supervision, radiation safety practices, performance of confined space and fire watches during the work activities.

b. Conclusion

No findings of significance were identified.

4. Management Organization and Controls (IP 88105)

a. Scope and Observations

During this period, the inspectors evaluated plant procedures changes and attended plant operations review committee (PORC) meetings. The inspectors reviewed facility staffing and overtime records, including management approval of overtime. The inspectors verified that personnel were notified and trained on procedure changes in a timely manner, and that procedure adherence policies were clear and appropriately disseminated. The inspectors reviewed the Assessment & Tracking Report (ATR) system (problem-identification system) to evaluate the certificate holder's effectiveness in resolving problems. The inspectors verified that deficiencies identified during other inspection activities were entered and tracked using the ATR system.

b. Conclusion

No findings of significance were identified.

5. Permanent Plant Modifications (IP 88070)

a. Inspection Scope and Observations

The inspectors interviewed the design engineering manager and reviewed the SAR and Design Change Process procedure to verify the certificate holder established an effective configuration management system that evaluated, implemented, and tracked permanent plant modifications to the site which could affect safety. The inspectors determined the configuration management system had adequate provisions that ensured permanent plant modifications did not degrade the performance capabilities of safety controls that are part of the safety design basis.

The inspectors reviewed the implementation of the following permanent plant modification design packages:

- ZB0320, C-333 Process Gas Leak Detection Wiring Deviation and Consistency Improvement
- ZB0640, Vacuum pump and manifold installation for C-710 spectrometers
- ZB4511, Local Temperature Indicators for Electronic Uranium
- ZB6100, Design and Replace Hoist Caliper Brake Systems on UF<sub>6</sub> Handling Cranes

The inspectors verified that applicable post maintenance installation and testing requirements were adequately identified and performed prior to implementation of permanent plant modification design packages. The inspectors determined that completed modifications were adequately reviewed prior to implementation and before returning affected equipment to service. The inspectors verified that designs of permanent plant modifications met the specific design criteria specified in applicable modification packages.

b. Conclusion

No violations of NRC requirements were identified.

C. Special Topics

1. Event Follow-up

Event Notice (EN) 47911: Autoclave High Pressure Isolation System Failure [Retracted].

On May 8, 2012, the certificate holder made a 24 hour notification (EN 47911) to the NRC pursuant to 10 CFR 76.120(c)(2) to report a safety system equipment failure. The certificate holder noted that the C-360 #2 autoclave was leaking water, which could have

been an indicator that the Autoclave High Pressure Isolation System (AHPIS) was inoperable. The certificate holder credited the AHPIS as a safety system designed to mitigate  $UF_6$  releases from inside the autoclave and credited the AHPIS as a nuclear criticality safety control to ensure  $UF_6$  is not released in an unfavorable geometry configuration. In response to the water leak, autoclave operation was halted and testing of the AHPIS was performed to determine if the system could still perform its safety function. The certificate holder performed a pressure decay test in the as-found condition of the AHPIS and verified that system would perform its safety function. The certificate holder subsequently retracted the EN on May 15, 2012. No issues were noted with the certificate holder's response to the event. The review of this event was closed.

EN 48022: Safety Equipment Failure – Criticality Air Horns Not Tested For Audibility [Retracted].

On June 13, 2012, the certificate holder made a 24-hour notification (EN 48022) to the NRC pursuant to 10 CFR 76.120(c)(2) to report a safety system equipment failure. The certificate holder's procedure CP4-GP-IM6513, "C-335 CAAS Maintenance and Testing," Revision (Rev.) 12, Step 8.8.9 states, in part, the actions that are to be performed if any as found value of a horn regulatory is more or less than 12 psig of the tag value. On April 28, 2012, personnel conducting the Criticality Accident Alarm System (CAAS) surveillance failed to perform the required steps to demonstrate operability when six horns were noted to be outside of the 12 psig band for audibility requirement. Instead of implementing Step 8.8.9 of the testing procedure to determine the acceptability of the as-found condition and to demonstrate operability, the regulators were adjusted back to their tag value. The out of tolerance horns were documented in an ATR for follow-up. A subsequent management review of the ATR on June 12, 2012, discovered that Step 8.8.9 had not been performed and the required testing to demonstrate operability of the system was not conducted. The system may not have been able to perform the required safety function and was reported to the NRC. The certificate holder created a work package to modify the regulators of the horns back to the as-found value from April 28, 2012, to demonstrate horns could have performed their safety function and demonstrate operability. The inspectors observed portions of this audibility testing and noted that three of the horns did not meet the criteria from procedure CP-GP-IM6513; however, additional testing conducted under procedure CP2-EG-EG6065, "Audibility Testing of the C-331, C-333, C-33A, C-335, C-337, and C-337A Criticality Accident Alarm System," Rev. 1, determined the horns met the minimum audibility requirement. The inspectors reviewed the certificate holder's engineering evaluation, EV-C-822-12-078, "CAAS Horn Audibility," Rev. 0, and confirmed that additional testing demonstrated the horns met the minimum audibility requirement and could have performed their safety function. The certificate holder subsequently retracted the EN on July 16, 2012. Even though the testing found the audibility acceptable, the certificate holder replaced all six air regulators. Based on the results of the operability evaluation, the inspectors determined the certificate holder's failure to conduct a proper test evaluation of the test data and to follow the CAAS testing procedure to demonstrate operability was a violation of minor safety significance and not subject to formal enforcement action. The review of this event was closed.



## 2. Follow-up on Previously Identified Issues

### Unresolved Item (URI) 70-7001/2012-002-01: Failure to Ensure Clear Path While Moving Liquid UF<sub>6</sub> Cylinders (Closed)

#### a. Inspection Scope and Observations

The inspectors conducted a detailed review of the events and circumstance following incidents involving crane operations and the handling of liquid filled UF<sub>6</sub> cylinders. The inspector reviewed procedures, training materials and lessons plans, corrective actions program entries, an investigative team's report, quality assurance program and SAR requirements, and hazard and accident analyses. The inspectors conducted interviews with responsible individuals, managers, and the workers involved in the incidents; reviewed video recordings of crane operations; conducted direct inspection of on-going crane operations and cylinder handling activities; and walked down the affected areas and facilities.

#### b. Conclusion

One Severity Level IV violation of NRC regulatory requirements was identified.

#### Introduction

The inspectors identified a violation involving the failure to follow procedures for overhead crane cylinder handling operations. Specifically, the certificate holder failed to operate the overhead UF<sub>6</sub> cylinder handling cranes in accordance with procedures and ran the crane's overhead bridge into the garage door while handling a liquid filled UF<sub>6</sub> cylinder on two separate occasions. On another occasion, the crane operators failed to follow procedures and hit a stationary cylinder while moving another cylinder.

#### Description

On December 18, 2011, in the C-360 Toll and Transfer Building, the operators were in the process of taking a cylinder partially filled with liquid UF<sub>6</sub> out of the building using the overhead crane to the cylinder cool-down yard outside. One operator opened the lower garage door and started the opening of the upper garage door before walking to join the operator at-the-controls on the upper deck. After both operators verified the lifting shackles were secured, the operator at-the-controls hoisted the cylinder and began to move the crane towards the outside garage door opening. While traveling, the bridge of the crane came into contact with the upper garage door that had not yet fully opened. The crane operator at-the-controls manipulated the crane to minimize load swing and returned the cylinder to the original scale cart position. Even though the garage door alarm was sounding as the upper door was opening, the at-the-controls operator was not attentive to the audible alarm and the other operator was placing paperwork near the scale cart house and was not watching. The collision resulted in moderate damage to the crane door, cosmetic damage to the crane bridge, and no damage to the cylinder. The crane doors were taken out of service. The certificate holder entered the incident into their corrective action program (ATRC 11-3386A).

On February 7, 2012, in Building C-360, another set of operators were taking a cylinder full of liquid  $\text{UF}_6$  out of the building using the overhead crane to the outside yard when the crane bridge collided with the closed upper garage door. The upper garage door had recently been repaired and returned to service. During the operators' shift, the garage doors were opened then closed, later in the shift the lower door was opened to allow cool air to enter the building, the upper door was left closed. When the time came to move the liquid cylinder to the outside yard after weighing, the crane operator hoisted the cylinder and began travel to the outside yard. While moving, the crane bridge bumpers collided with the upper garage door. The at-the-controls operator did not realize the upper garage door had not been opened. He reported he had focused his attention on aligning the crane with the hash marks to ensure the cylinder cleared the lower garage door opening. Both operators reported during the interview they were focused on the cylinder and not the bridge of the crane. The cylinder was safely returned to the original scale cart position. The upper garage door was damaged and removed from service. The certificate holder entered the incident into their corrective action program (ATRC 12-0358) and formed a Significant Condition Adverse to Quality (SCAQ) team to investigate both events.

On March 13, 2012, in Building C-360, an operator reported he had hit a file cabinet in the autoclave high bay area with a solid  $\text{UF}_6$  cylinder while conducting cylinder movement on February 23, 2012. He reported the incident when building management questioned the staff about the damage to the file cabinet. On the day of the incident, he operated the crane alone as allowed by the site's crane operating practices for cylinders containing solid  $\text{UF}_6$ . After striking the file cabinet, he conducted the pre heating inspection of the cylinder and successfully heated the cylinder in the autoclave. He did not report the event at the time since the cylinder sustained cosmetic damage and the file cabinet was excess and he was not aware of an additional inspection requirement. He was unaware of the inspection required by a criticality control for a fissile cylinder after a cylinder makes contact with an object. Following the report, the cylinder was tagged and removed from service and then evaluated as required by a criticality control for cylinder integrity. The certificate holder evaluated the incident as a nuclear criticality control near miss. (ATRC 12-0676).

On April 25, 2012, while inspecting overhead crane operating practices and cylinder movement in the feed facility Building C-337A, the inspectors observed the crane operator moving a solid product cylinder while not facing the load. He walked ahead of the traveling crane and the moving cylinder was to his rear. Even though he was working alone as allowed by the site's crane operating practices, he failed to operate in accordance with the overhead crane operating procedure when he was not facing the crane and the load. The procedure required the operator to face the crane at all times when the crane was in motion. The certificate holder entered the incident into their corrective action program (ATRC 12 1059) and expanded the corrective actions from previous incidents to include all  $\text{UF}_6$  handling personnel and buildings.

On May 27, 2012, in the tails withdrawal facility, Building C-315, two crane operators and a supervisor providing management oversight were conducting cylinder handling operations in order to weigh cylinders. Using the overhead crane, the operator at-the-controls was moving a cylinder in the yard from the liquid cool-down row on the West side maneuvering around cylinders in the solid East row in order to take the

cylinder to the building for weighing. After the operators verified the shackles were secured for lifting, the operator at-the-controls hoisted the cylinder and began moving with the load. The operator did not clear the stationary cylinder in the East row while maneuvering and the moving cylinder hit the stationary cylinder causing both to move and the suspended cylinder to swing. Both cylinders sustained minor surface damage but the structural integrity of the cylinder remained intact. The other operator who was involved in the lift and the supervisor reported they had focused their attention on a nearby liquid cylinder to ensure the moving cylinder remained clear. The inspectors determined by direct inspection, the operator at-the-controls was not in a position where there was clear line of sight of the travel path. The certificate holder entered the incident into their corrective action program (ATRC 12-1358) and clarified expectations to the managers for proper oversight and the operators during cylinder handling operations.

### Analysis

The SAR in Section 3.7, "UF<sub>6</sub> Cylinders, Storage Yards, and Handling Equipment" identifies the UF<sub>6</sub> cylinders and UF<sub>6</sub> cranes as important to safety. The cylinder's safety function is to provide primary containment to prevent a release of UF<sub>6</sub> to the atmosphere. The UF<sub>6</sub> cylinder handling cranes safety function is not to fail in a manner that causes a UF<sub>6</sub> primary system failure and the cranes are designed for the safe movement of liquid-filled cylinders. The cylinder failure event has been classified as an Evaluation Basis Event (EBE) whose consequences could exceed the off-site emergency guidelines if the cranes were to fail in a manner that resulted in the drop and failure of a liquid-filled cylinder. The UF<sub>6</sub> cylinder handling cranes are designed and approved for handling liquid-filled UF<sub>6</sub> cylinders and meet the criteria for classification as a quality "Q" system.

The SAR in Chapter 4, "Accident Analysis" analyzes the physical integrity failure of a liquid-filled cylinder failing outside of an autoclave and identifies administrative controls to preclude the failure of the cylinder's primary system integrity. The SAR credits cylinder inspections and qualified operators as administrative controls to preclude the failure of the cylinder.

The inspectors determined the failure of the qualified operators to follow procedures for safe operations using the overhead cranes when handling and in the area of liquid UF<sub>6</sub> cylinders to be a performance deficiency and a violation. Specifically, the operators, on several occasions, failed to ensure the load did not contact any obstructions and failed to ensure the path was clear from obstructions. The deficiency was determined to be more than minor because if the failure to follow procedures is left uncorrected a more significant safety concern could exit. The violation was similar to a SL IV example in the NRC Enforcement Policy, "Fuel Cycle Operations," paragraph 6.2.d.2, where failure of a safety control occurs such that an acceptable safety margin has not been maintained, but the failure does not result in a Severity I, II, or III violation. Specifically the administrative control credited in the accident analysis of qualified operators who follow procedures failed such that an acceptable safety margin had not been maintained.

## Enforcement

10 CFR part 76.93, requires that the certificate holder establish, maintain, and execute a quality assurance program satisfying each of the applicable requirements of ASME NQA 1 1989, "Quality Assurance Program Requirements for Nuclear Facilities," or satisfying acceptable alternatives to the applicable requirements; and that the certificate holder execute the criteria in a graded approach to an extent that is commensurate with the importance to safety. ASME NQA-1-1989, section II, "Basic Requirements," paragraph 2, "Quality Assurance Program," requires that a documented quality assurance program be planned, implemented, and maintained in accordance with this Standard, or portions thereof. The quality assurance program has been established to achieve the required level of safety and quality and that it has been established in a graded, three-category program with the level of quality designation of "Q" as important to safety. Section 3.15 of the certificate holder's SAR, "Safety System Classification," and in Table 3.15-1, "Boundary Definition for Q Structures, Systems, and Components," has identified the UF<sub>6</sub> cylinder handling cranes and the UF<sub>6</sub> cylinders as "Q" systems and components. The quality assurance program requires activities affecting quality are prescribed in documented procedures and "Q" activities are performed in accordance with documented work procedures. Procedure CP2-CO-CA2031, "Operation of Overhead Cranes," Step 8.17.5, directs the operator to ensure the load does not contact any obstructions, and Step 8.17.10, directs the operator to ensure the path is clear from obstructions when moving liquid filled UF<sub>6</sub> cylinders.

Contrary to the above, the crane operators failed to follow procedures when conducting overhead crane operations while handling and in the area of liquid-filled uranium hexafluoride cylinders. Specifically, on May 27, 2012, in Building C-315, the operators struck a stationary cylinder while moving a solid cylinder from the liquid-filled cylinder cool down area and on December 18, 2011 and on February 7, 2012, in Building C-360, the operators struck the building overhead garage door while conducting liquid-filled cylinder movement. The operators failed to ensure the load did not contact any obstructions and failed to ensure the path was clear from obstructions. (Violation (VIO) 70-7001/2012-003-01)

### URI 07007001/2011-004-01, Process Gas Leak Detectors (PGLD) (Open)

#### a. Inspection Scope and Observations

The inspectors continued to evaluate the licensing basis for the authorization and safe use of the Process Gas Leak Detector (PGLD) devices. The inspectors reviewed the basis for authorized use, certificate commitments, the requirements specified on the labels on the devices, and the control and handling of the PGLD devices.

#### b. Conclusion

The inspectors continue to inspect and the issue remains open.

D. Exit Meeting

The inspection scope and results were summarized on July 11, 2012, with Mr. J. Lewis, Site Vice President and General Manager at the quarterly exit meeting and on May 24, and July 26, 2012, with members of his certificate holder's staff. The certificate holder acknowledged the issues presented. The inspectors confirmed no proprietary information was identified.

## SUPPLEMENTAL INFORMATION

### 1. List of Persons Contacted

Name	Title
M. Boren	Regulatory Compliance and Nuclear Operations
M. Buckner	Plant Manager
S. Childers	Quality Control Manager
D. English	Nuclear Safety and Quality Manager
L. Fink	Regulatory Engineer
S. Gunn	Operations Manager
T. Henson	Nuclear Criticality Safety Manager
O.E. Hickman	Radiation Protection Manager
M. Keef	Field Services Manager
J. Lewis	Vice President and General Manager
S. McKinney	Engineering Manager
L. Moffatt, II	Cascade Manager
V. Shanks	Regulatory Affairs Manager
S. Shell	Production Support and Product Scheduling Manager
S. Smith	Security Manager
D. Snow	Environmental, Safety, and Health Manager
D. Stadler	Lead, Regulatory Engineer
J. Stephens	Regulatory Engineer
C. Willett	Maintenance Manager

### 2. List of Documents Reviewed

#### Procedures:

CP4-CO-CN2051t, C-360 UF<sub>6</sub> Transfer, Rev. 12  
CP4-CO-CN6046g, C-333A/C-337A UF<sub>6</sub> Detection Safety and Non-Safety Systems, Rev. 9  
CP4-CO-CN6040j, UF<sub>6</sub> Detection Test for C-331, 333, 335, 337, Rev. 9  
CP4-CO-CN6073, Testing of C-333A/337A Autoclave Manual Isolation System, Rev. 6  
CP4-CO-CN2002, Cell Isolation and Evacuation to Cascade, Rev. 14  
CP4-CO-CN2004, Cell Evacuation, Rev. 25  
CP4-CO-CP6001w, C-331 Emergency Diesel Power Systems Test Operations, Rev. 9  
CP2-EG-EG1046, Design Change Process, Rev. 6

#### Other Documents:

EN-C-821-98-044, Evaluation of Smoke Test Methodology and Compliance Plan 49, Rev. 0  
DAC-821-16615-0032, Compliance Plan Issue 49, Rev. 0  
KY/L-1894, Rev. 0  
DIVS-ZB6100-C001, Rev. 0  
CP4-CO-CN6020t, TSR Surveillance – Test Firing of PYR-A-Larm Type 1, High Voltage UF<sub>6</sub> Detection Systems in C-331/333/335/337, Rev. 17  
CP4-CO-CN2045a, Operation of the C-333A and C-337A Vaporizer Facilities, Rev. 37  
CP2-HP-RP1046, Sealed Radioactive Source Control, Rev. 1  
CP4-HP-RP2102, Radioactive Source Control, Rev. 5  
CP4-QA-QI6085, Inspection and Load Test of UF<sub>6</sub> Cylinder Handling Cranes, Rev. 9

CP4-QA-QI6089, Structural and Mechanical Below-The-Hook Lifting Device Inspections, Rev. 6  
 CP4-QA-QI6081, Overhead and Semigantry Crane Inspection, Rev. 6  
 CP4-GP-IM6130, 000 Cell Datum and Deviation Calibration, Rev. 9  
 CP4-GP-IM4133, Buggy Connection and Disconnection, Rev. 11  
 CP4-CO-CP6001z, C-337 Emergency Diesel Power Systems Test Operation, Rev. 5  
 CP4-CO-CN200, Charging a 00 or 000 Cell from Cascade and Placing On-Stream, Rev. 14  
 CP4-GP-EM6130, Dry Type Power and Distribution Transformers, Cleaning and Repair, Rev. 5  
 CP3-CO-CO2060, Leak Testing 'Q' and 'AQ-NCS' Systems, Rev. 0  
 CP2-CO-CO1032, Shift Routines and Operating Practices, Rev. 18  
 CP2-SH-SH1031, Confined Space Program, Rev. 5

### 3. **List of Items Opened, Closed, and Discussed**

Item Number	Status	Type/Description
70-7001/2011-004-01	Discussed	URI – Process Gas Leak Detectors (PGLD) authorization/use
70-7001/2012-003-01	Open	VIO - Failure to Follow Procedures to Ensure Clear Path
70-7001/2012-001-00	Open/Closed	LER - Event Number 47911: Autoclave High Pressure Isolation System Failure [Retracted]
70-7001/2012-002-00	Open/Closed	LER - Event Number 48022: Safety Equipment Failure – Criticality Air Horns Not Tested For Audibility
70-7001/2012-002-01	Closed	URI - Failure to Ensure Clear Path While Moving Liquid UF <sub>6</sub> Cylinders

### 4. **List of Inspection Procedures Used**

88020 Operational Safety  
 88070 Permanent Plant Modifications  
 88100 Plant Operations  
 88101 Configuration Control  
 88102 Surveillance Observations  
 88103 Maintenance Observations  
 88105 Management Organization and Controls

### 5. **List of Acronyms Used**

AHPIS Autoclave High Pressure Isolation System  
 ASME American Society of Mechanical Engineers  
 ATR Assessment & Tracking Report

CAAS	Criticality Accident Alarm System
CFR	Code of Federal Regulations
EN	Event Notice
IP	Inspection Procedure
LCO	Limiting Condition of Operation
LOTO	Log-out/Tag-out
NRC	Nuclear Regulatory Commission
NCSE/A	Nuclear criticality Safety Evaluation/Approval
PORC	Plant Operations Review Committee
QC	Quality Control
Rev.	Revision
SAR	Safety Analysis Report
SCAQ	Significant Condition Adverse to Quality
SSC	Structures, Systems, and Components
TSR	Technical Safety Requirement
UF <sub>6</sub>	Uranium Hexafluoride
URI	Unresolved Inspection Item
VIO	Violation