



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

February 11, 2013

EA 12-235
EN 46996, EN 48022
EN 47531, EN 48398

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

**SUBJECT: NUCLEAR REGULATORY COMMISSION INTEGRATED INSPECTION
REPORT NUMBER 70-7001/2012-005**

Dear Mr. Van Namen:

This letter refers to inspections conducted from October 1 through December 31, 2012, at the Paducah Gaseous Diffusion Plant. The purpose of the inspections was to determine whether activities authorized by the certificate were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of the inspections. The NRC inspectors discussed the inspection findings with members of your staff during exit meetings held on November 8, 2012 and January 25, 2013.

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

Six apparent violations were identified and are being considered for escalated enforcement action 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. The six apparent violations involved failures to properly manage the Process Gas Leak Detector (PGLD) devices as radioactive material devices which include the failure to maintain control of the devices, perform leak testing, perform inventories, perform surveys, maintain the required radioactive material labeling, and improper waste shipments. The apparent violations are described in Paragraph C.2.c of the enclosed report. The circumstances surrounding these apparent violations, the significance of the issues, and the need for lasting and effective corrective action were discussed with members of your staff at the inspection exit meeting on January 25, 2013.

You should be aware that Section 2.3.4 of the NRC Enforcement Policy states that for violations involving the loss, abandonment, or improper transfer or disposal of a sealed source or device, the NRC should normally exercise discretion when proposing the imposition of a civil penalty of at least the base amount. Since one of the apparent violation involves the loss, improper

transfer or disposal of twelve devices (960 microcuries (uCi) total of Americium--241), the NRC is considering proposing imposition of a civil monetary penalty. The base civil penalty amount is based on approximately three times the expected average cost of authorized disposal; however, the NRC may consider adjusting the civil penalty amount to a more appropriate base amount if you can demonstrate that three times the actual cost of disposal would be significantly less than the base amount. However, NRC will not normally decrease the civil penalty to an amount below the lowest base civil penalty for such cases, i.e., \$3,500.

Before the NRC makes its enforcement decision, we are providing you an opportunity to (1) respond to the apparent violations addressed in this inspection report within 30 days of the date of this letter, or (2) request a Pre-decisional Enforcement Conference (PEC). If a PEC is held, the conference will be open for public observation and the NRC will issue a press release to announce the time and date of the conference. If you decide to participate in a PEC, please contact Lisa Castelli at 404-997-4419 within 10 days of the date of this letter. A PEC should be held within 30 days of the date of this letter.

If you choose to provide a written response, your response should be clearly marked as a "Response to Apparent Violations in Inspection Report No. 70-7001/2012-005; EA-12-235" and should focus on the apparent violation involving the failure to maintain control of the radioactive PGLD devices. Your response should include your actions for the other listed apparent violations since they are collectively related to the fundamentals of radioactive materials controls; in addition, provide information as to why your corrective action program was unable to correct the issues associated with the apparent violations. For each apparent violation: (1) the reason for the apparent violation, or, if contested, the basis for disputing the apparent violation; (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 previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision or schedule a pre-decisional enforcement conference.

If you choose to request a PEC, the conference will afford you the opportunity to provide your perspective on the apparent violations and any other information that you believe the NRC should take into consideration before making an enforcement decision. The topics discussed during the conference may include the following: information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned to be taken. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your actions will be considered in assessing any civil penalty for the apparent violations.

We are aware that as of February 6, 2013, you have identified additional information that may classify some of the PGLD devices models possessed as exempt from regulatory requirements. In your response, please provide your basis for the applicability of such exemption to the PGLD devices. Also, please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results of our deliberations on this matter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, the enclosure, 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) 997-4700.

Sincerely,

/RA/

Anthony T. Gody, Director
Division of Fuel Facility Inspection

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

Enclosure:
NRC Integrated Inspection Report
No. 70-7001/2012-005
w/Attachment: Supplemental Information

cc w/encls: (See page 4)

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NRC Integrated Inspection Report
No. 70-7001/2012-005
w/Attachment: Supplemental Information

cc w/encl: (See page 4)

Distribution w/encl:

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- R. Russell, RII

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE ADAMS: X Yes
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OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	RRI:DFFI	RII:EICS	RII:OE	RII:DFFI
SIGNATURE	Via e-mail	/RA/	/RA/	Via e-mail	Via e-mail	Via e-mail	/RA/
NAME	RRussell/DH	LPitts	JDiaz	NPeterka	SSparks	TMarenchin	LCastelli
DATE	1/30/2013	2/11/2013	2/6/2013	2/11/2013	2/5/2013	2/5/2013	2/11/2013
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\DRAFT INSPECTION REPORT FOLDER\PADUCAH\2012\PADUCAH GDP REPORT 2012-005 (20130206) SMITH SIURANO PITTS DIAZ RUSSELL HARTLAND PETERKA GOFF COMMENTS INCORPORATED.DOCX

R. Van Namen

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cc w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-7001

Certificate No.: GDP-1

Report No.: 70-7001/2012-005

Licensee: United States Enrichment Corporation

Facility: Paducah Gaseous Diffusion Plant

Location: Kevil, KY 42053

Dates: October 1 through December 31, 2012

Inspectors: J. Díaz-Vélez, Senior Fuel Facility Inspector
L. Pitts, Senior Fuel Facility Inspector
R. Gibson, Senior Fuel Facility Inspector
D. Hartland, Senior Fuel Facility Inspector
R. Russell, Resident Inspector
G. Goff, Fuel Facility Inspector
P. Startz, Fuel Facility Inspector
N. Peterka, Fuel Facility Inspector
J. Downs, Fire Protection Engineer

Approved by: Lisa Castelli, Acting Chief
Fuel Facility Inspection Branch 2
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

United States Enrichment Corporation
Paducah NRC 2012 4th Quarter Integrated Inspection Report 70-7001/2012-005
October 1, 2012 – December 31, 2012

U.S. Nuclear Regulatory Commission (NRC) resident and regional 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 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 operations of the facility with the exception of issues discussed below in the Special Topics section. (Paragraph A.1)
- The inspectors opened an Unresolved Item (URI) in order to review the results of the certificate holder's analysis and evaluation of the C-360 cylinder tilt mechanism [URI 70-7001/2012-005-07]. (Paragraph A.1)
- The fire protection systems were adequately maintained in accordance with site procedures. (Paragraph A.2)

Facility Support

- 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.1)
- 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, and approved work packages. (Paragraph B.2)
- 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.2)

- Plant procedures, including temporary procedures, were maintained, reviewed, and/or changed in accordance with the certificate requirements. Internal reviews and audits were performed to assess the effectiveness of activities affecting safety. The Plant Operations Review Committees met regularly to review activities important to safety and to provide management with recommendations. The corrective action program used the action tracking system to identify trends and deficiencies and track corrective actions. (Paragraph B.3)

Special Topics

- Two event notices (ENs) related to fire safety equipment were closed. (Paragraphs C.1.a and C.1.b)
- One EN (70-7001/2012-005-00) was opened related to the criticality accident alarm system uninterrupted power supply. (Paragraph C.1.c)
- A previously identified violation related to reporting contamination events was closed. (Paragraph C.1.d)
- One EN was opened related to the loss double contingency related to the testing of cylinders for hydrocarbons (70-7001/2012-04-00). (Paragraph C.1.e)
- The unresolved item (URI) (URI 70-7001/2011-004-01), Process Gas Leak Detector (PGLD), was closed and the concerns were tracked as Apparent Violations (AVs) discussed below. (Paragraph C.2.b)
- An AV (AV 70-7001/2012-005-01) was opened related to control of radioactive material in the PGLD devices. (Paragraph C.2.c.1)
- An AV (AV 70-7001/2012-005-02) was opened related to a waste shipment of the PGLD devices. (Paragraph C.2.c.2)
- An AV (AV 70-7001/2012-005-03) was opened related to leak testing of the PGLD devices. (Paragraph C.2.c.3)
- An AV (AV 70-7001/2012-005-04) was opened related to inventory of the PGLD devices. (Paragraph C.2.c.4)
- An AV (AV 70-7001/2012-005-05) was opened related to radiological survey associated with PGLD maintenance activities. (Paragraph C.2.c.5)
- An AV (AV 70-7001/2012-005-06) was opened related to the labeling of the PGLD devices. (Paragraph C.2.c.6)

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 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 (UF₆) 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 Title 10 of the Code of Federal Regulations (10 CFR) 19.11 and 10 CFR 21.6. The inspectors confirmed that the certificate holder conspicuously posted 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.

On November 25, 2012, the gear mechanism that was used to tilt a liquid UF₆ cylinder in preparation for transfer to daughter cylinders failed while being operated inside partially opened Autoclave No. 4 at Building C-360. The failure caused the plug end of the 10 ton cylinder, which was as much as 18 inches above ground level, to fall back into the horizontal position. No release of UF₆ resulted and a subsequent inspection of the cylinder did not reveal any apparent damage.

As an immediate interim action, the certificate holder suspended autoclave operations in Building C-360 pending results of the ongoing investigation. The certificate holder also allowed the cylinder content to cool and solidify prior to commencing recovery actions which included removal of the cylinder from the autoclave.

Subsequent inspection of the tilt mechanism revealed that the failure occurred because the gear traveled past its limit ultimately resulting in stripping the threads on the lifting screw that the gear turned on. The certificate holder returned to sample and transfer operations with cylinders in the horizontal position after implementing a modification to the tilt mechanism. The modification installed a mechanical device that would prevent the cylinder from dropping in the event that another failure of the mechanism occurred.

Since the certificate holder did not designate the tilting gear as a safety related component, the failure was not reportable per 10 CFR 76.120. However, a potential unreviewed safety question (USQ) existed related to the failure and resulting cylinder drop which may have not been previously analyzed. As a result, tilt operations remained on hold pending the results of the certificate holder's evaluation to determine if the failure of the non-safety related tilt mechanism could result in a liquid UF₆ cylinder rupture. The results of the certificate holder's evaluation will be tracked as URI 70-7001/2012-005-07.

b. Conclusion

The inspectors opened a URI in order to review the results of the certificate holder's analysis and evaluation of the C-360 cylinder tilt mechanism failure (URI 70-7001/2012-005-07).

2. Fire Protection Triennial and Annual (IPs 88054 and 88055)

a. Inspection Scope and Observations

The inspection area focused on the C-331, C-333, C-335, and C-337 Process Buildings; the C-310 Purge and Product Building; the C-360 Toll Transfer and Sampling Building; the C-720 Maintenance and Stores Building and the C-631-1 and C-631-3 Pump house and Firewater Pump house. In addition, the inspectors also conducted a general tour of other areas around site including cooling towers and administrative buildings.

The inspectors reviewed the Fire Hazards Analysis (FHA) for the C-331, C-333, C-335, and C-337 Process Buildings and the C-360 Toll Transfer and Sampling Building. No changes to the FHA had been made since the previous triennial fire protection inspection and the inspectors noted no discrepancies between the FHA

and the actual building conditions. The inspectors also reviewed the pre-fire plans for the above buildings to ensure the pre-fire plans reflected the as-found fire protection equipment locations and hazards. In addition, the inspectors verified that pre-fire plans and any associated attachments provided to on-site emergency responders were current.

The inspectors reviewed the certificate holder's transient combustibles and ignition sources programs. The inspectors verified that flammable materials were stored in marked cabinets as specified in approved procedures and that housekeeping and the control of combustible materials were adequate and consistent with the approved procedures. The inspectors observed the material condition of the lube oil storage tanks and their associated dikes within the process buildings and verified compliance with the transient combustibles exclusion zone set up around the lube oil storage tanks. The inspectors reviewed the hot work permit program and determined that the certificate holder established adequate measures to control ignition sources throughout the facility.

The inspectors reviewed the material condition, operational lineup, and design of fire suppression and detection systems within the process buildings and the C-720 Maintenance and Stores Building. The inspectors observed that the wet-pipe sprinkler systems were spaced properly, not obstructed, or damaged and that the sprinkler heads observed did not exhibit signs of corrosion. The inspectors verified that the satellite fire alarm panels and central alarm panel received power from two independent sources. The inspectors verified that the central alarm panel electronically supervised satellite alarm panels and fire-water pump controllers. The central alarm panel provided both visual and audible trouble alarms to operators. The inspectors verified the operational lineup of the diesel and electric fire-water pumps for availability. The inspectors reviewed building design calculations for water suppression systems for the process buildings and determined the sprinkler systems provided adequate coverage for the specified area.

The inspectors reviewed records and interviewed personnel to verify that observed fire protection systems and equipment were maintained in an adequate state of readiness and had been properly tested to verify their ability to perform their safety functions. The inspectors reviewed the certificate holder's fire protection system out of service records and determined that adequate compensatory measures had been put in place for out of service, degraded or inoperable fire protection equipment, systems or features. The inspectors determined that fire extinguishers and fire alarm pull boxes were provided at their designated locations with unobstructed access. In addition, the inspectors verified that the site emergency lights preventive maintenance program conformed with National Fire Protection Association 101, Life Safety Code requirements regarding periodic operational and functional tests.

The inspectors reviewed the certificate holder's corrective action program entries for the past 10 months and determined that the certificate holder was identifying fire protection operability problems at an appropriate threshold and entering them into the program (Assessment and Tracking Reports (ATRs)).

b. Conclusion

No findings of significance were identified.

B. Facility Support

1. 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.

2. 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.

b. Conclusion

No findings of significance were identified.

3. Management Organization and Controls (IP 88105)

a. Scope and Observations

During this period, the inspectors evaluated plant procedure changes and attended plant operations review committee meetings. The inspectors reviewed facility staffing levels in the cascade buildings and central control facility during normal and backshift hours to evaluate adherence to the minimum staffing requirements. The inspectors verified that personnel were notified and trained on procedure changes in a timely manner and procedure adherence policies were clear and appropriately disseminated. The inspectors reviewed the problem identification and corrective action (ATRC) 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 ATRC system.

b. Conclusion

No findings of significance were identified.

C. Special Topics

1. Event Follow-up

a. Event Notice (EN) 47531: Possible Degradation in High Pressure Fire Water Sprinkler Heads (CLOSED)

On December 1, 2011, the certificate holder informed the NRC they had discovered 32 corroded sprinkler heads in the C-310 Purge and Product Building and had entered LCO in accordance with their TSRs. The corroded sprinkler heads were discovered while conducting a sprinkler head inspection in the C-310 Building as part of a larger sprinkler head inspection and tracking program being conducted within the process buildings. The inspection was a result of corrective actions from previously identified corroded sprinkler heads in other parts of the plant.

The certificate holder's immediate corrective actions were to implement an hourly fire patrol and verify a high-pressure fire-water hydrant available near the building per TSR 2.4.4.5 requirements. The long term corrective actions included replacing all 280 sprinkler heads on the C-310 cell floor. In addition, the certificate holder revised their procedure for inspection of the roof level sprinkler heads to require inspection from elevated walkways if possible instead of the inspections being conducted from the floor level. The inspectors reviewed the corrective actions taken by the certificate holder to address EN 47531 and determined them to be adequate. The review of this event was closed.

b. EN 46996: Failure of High Pressure Fire Water Pump No. 2 to Realign (CLOSED)

On June 28, 2011, the certificate holder informed the NRC their No. 2 and No. 3 High Pressure Fire Water System (HPFWS) pumps started on low header pressure due to a line leak. Following isolation of the water leak, the pumps were shut down and being configured for automatic start to bring the system to its standby condition. An operator observed the 'Auto Start' indicator for the No. 2 pump was not illuminated and the pump was declared inoperable while it was repaired. When the pump was declared inoperable, the HPFWS could not meet its intended safety function of providing 4875 gallons per minute (gpm) per TSR LCO 2,4,4,8. The No. 2 pump was restored to service approximately 15 minutes after being declared inoperable.

The certificate holder later retracted the event after determining that the HPFWS was capable of fulfilling its intended safety function at all times during the incident. The certificate holder determined that the HPFWS could have supplied the 3700 gpm required for the evaluation basis fire event described in Safety Analysis Report (SAR) Section 3.15.7.2. The inspectors reviewed the basis for the retraction and had no further issues. The review of this event was closed.

c. EN 48522: Failure of the C-409 Criticality Accident Alarm System Uninterruptable Power Supply (OPEN)

On November 20, 2012, the certificate holder made a 24-hour notification (EN 48522) to the NRC to report a failure of the Criticality Accident and Alarm System (CAAS) in Building C-409. The failure involved the loss of the audible alerting portion of the system. On November 19, 2012, electrical maintenance and power operations workers were performing circuit breaker change-out in the C-409 facility. The breaker supplied power to the C-409 CAAS Uninterruptable Power Supply (UPS) which supplied the power to the CAAS horns. In the event of an alternate current (AC) power failure, the UPS would be expected to supply battery power to the C-409 CAAS horns, but on the day of the breaker change-out, the UPS failed to throw over to battery power. Maintenance personnel were monitoring the throw over and as soon as the breaker was opened, they identified that the UPS failed to throw over to battery power. The certificate holder reset the breaker and restored AC power to the CAAS horns. The certificate holder estimates the AC power was off the CAAS horns for approximately three to five seconds. The certificate holder reported the event in accordance with 10 CFR 76.120(c)(2)(i) because the CAAS equipment was disabled when (a) the equipment was required by the TSR LCO 2.6.4.1b to prevent exposures to radiation and radioactive materials exceeding specified limits, mitigate the consequences of an accident, or restore this facility to a pre-established safe condition after an accident; (b) the equipment was

required by a TSR to be available and operable and either should have been operating or should have operated on demand; and (c) no redundant equipment was available and operable to perform the required safety function. This issue remains open.

d. Violation (VIO) 70-7001/2011-002-02: USEC-PGDP Failed to Notify the NRC Within 24 Hours of an Unplanned Contamination Event (CLOSED)

On February 4, 2011, the certificate holder failed to notify the NRC within 24 hours following an unplanned contamination event in the withdrawal room in Building C-310 that required access to the contaminated area by workers to be restricted for more than 24 hours by imposing additional radiological controls. In a letter to the NRC titled, "Reply to Inspection Report 70-7001/2011-002: Notice of Violations (NOVs) 2011-002-01 and 02," dated June 3, 2011, the certificate holder denied that a VIO of NRC requirements had occurred. The basis for their denial was that the contamination was not from a spill or release of product material but from a steam condensate leak which mobilized existing contamination to non-contaminated areas. In reply to the certificate holder, the NRC sustained the VIO in a letter dated August 31, 2011, "Withdrawal of Notice of Violation 70-7001/2011-002-01 and Reply to Notice of Violation 70-7001/2011-002-02" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11244A006). In response by letter dated September 30, 2011 (ADAMS Accession No. ML11280A126), to the NRC, the certificate holder accepted the violation. The certificate holder took corrective actions and provided guidance to the Plant Shift Superintendent (PSS) concerning the reporting criteria and requirements. The review of the VIO was closed.

e. EN 48398: Failure to Maintain Double Contingency for Cylinders Prior to Filling (Hydrocarbon Testing) (OPEN)

On October 10, 2012, the PSS was notified that during reviews of paperwork for a customer order, they discovered four clean, empty cylinders used for transfer did not have a hydrocarbon test performed prior to filling, in violation of NCSA 360-005. NSCA 360-005 requires a test be performed for never used non-USEC owned cylinders prior to filling to detect the presence of hydrocarbons. The event and associated corrective actions will be the subject of further NRC inspection.

2. Follow-up on Previously Identified Issues

a. VIO 70-7001/2012-003-01: Operators Failed to Follow Procedures When Conducting Overhead Crane Operations (OPEN)

The certificate holder determined that the root cause for the incidents was a lack of rigor with the use of error prevention tools such as task preview and peer checks during cylinder movement. As corrective action, the certificate holder revised the applicable procedure to require a task preview and incorporate the formal use of error prevention tools for all liquid UF₆ cylinder movements.

On December 26, 2012, while operators were moving a liquid cylinder outside Building C-315, the crane gantry leg struck a trailer carrying solid cylinders. No damage to the cylinders occurred because of the incident. In response to the latest

incident, the certificate holder implemented additional actions to install barricades in the road adjacent to the cylinder yard to prevent cylinder haulers and trailers from entering the yard during liquid cylinder movement. The certificate holder is also further enhancing the training provided to operators regarding cylinder handling. This violation will remain open to review the effectiveness of the certificate holder's corrective actions.

b. URI 07007001/2011-004-01, Process Gas Leak Detectors (PGLDs)

The NRC has completed inspection of URI 70-7001/2011-004-01, PGLDs, and this issue will be closed under this report. Concerns associated with this issue are now being tracked as Apparent Violations (AVs) 70-7001/2012-005-01 thru 70-7001/2012-005-06.

Inspection Scope

The inspectors evaluated the licensing basis for the authorization and safe use of the PGLD devices. The inspectors reviewed the certificate commitments and the requirements specified on the labels on some of the devices. The inspectors evaluated the certificate holder's use of the PGLD devices in the gaseous diffusion process, the control and management of the PGLD devices as radioactive material, the storage of the devices, the installation and removal, maintenance, and refurbishment of the PGLD devices, and disposal of the devices. The inspectors performed tours of the facilities, conducted selective examination of activities, performed interviews and discussions with personnel, evaluated corrective actions, and reviewed facility procedure and records.

Background

The certificate holder uses multiple PGLD devices throughout the process buildings as part of the UF₆ Release Detection System as described in Section 3.3.5.9.5 of the SAR for the Paducah plant. The system functions to detect and alarm to alert facility personnel to take appropriate actions in the event of a release of the UF₆ process gas. The detectors are installed in areas such as cell housings, bypass housings, compressor seals, autoclaves, inter-building tie-lines, process piping, and laboratory areas.

The PGLD devices operate using an alpha emitting radioactive ionization source. The typical detector has 80 microcuries (uCi) of Americium-241 (Am-241) and the certificate holder possesses approximately 4,800 of these devices. The PGLD devices at the plant site are either in use, in storage, or awaiting disposition such as disposal, refurbishment, or cleaning. Some of the PGLD devices have labeling to indicate their restricted use under a general license or under an NRC specific license. Many of the PGLD devices have the following warnings and prohibitions on the label:

"Generally Licensed by Section 30.21 (c) 10 CFR 30 Manufactured and Distributed by Pyrotronics, Inc. Pursuant to AEC License GL 133. Do not transfer, abandon, or dispose of this device except by return to Pyrotronics, Inc. or transfer to other specifically licensed persons. If exposed to fire or otherwise damaged, operation shall be immediately

suspended until tested for leakage of radioactive material and repaired. Maintenance, Tests, or repairs to be made by persons specifically licensed to perform such services. To be tested for leakage of radioactive material at intervals not to exceed three years. Removal of this label Prohibited by AEC Regulators."

On February 18, 2009, a PGLD device entered the waste stream when it was improperly shipped to a waste processing facility. On May 5, 2009, the certificate holder was notified by the waste processing contractor (Perma-Fix of Florida) that improper shipping of a PGLD device occurred (ATRC 09-1056, Non-Conforming Item Discovered at Waste Facility). On November 5, 2010, as documented in NRC Inspection Report 70-07001/2010-003 (ADAMS Accession No. ML103090235), the NRC identified a VIO related to the improper shipment of a PGLD device. The PGLD device was not shipped as waste with the radioactive classification. The NRC issued a VIO (ADAMS Accession No. ML103090228), for the failure of the certificate holder to prepare proper shipping papers, improper labeling of the container, failure to placard the truck, and failure to ship as exclusive use only. The certificate holder's corrective actions were documented in their response to the NOV (ADAMS Accession No. ML103470282). As part of the corrective actions, the certificate holder established additional waste collection containers for PGLD devices and communicated a briefing sheet to alert the employees of the requirements for proper disposal of the devices.

On October 14, 2010, as a result of the inspectors questioning, the certificate holder initiated corrective action ATRC 10-2946, "Evaluation of PGLD Detector Storage and Handling" to evaluate the proper handling, storage, and disposal of the PGLD devices. On December 8, 2010, the certificate holder determined that PGLD devices were being controlled in accordance with regulations and were exempt from licensing requirements since the devices were been used as gas/aerosol detectors pursuant to 10 CFR 30.15 and Part 30.20. The certificate holder reached their conclusion interpreting NUREG-1717, "Systematic Radiological Assessment of Exemption for Source and Byproduct Materials."

On January 25, 2011, the certificate holder initiated corrective action ATRC 11-0201, "PGLD Head Labeling" in response to the inspectors questioning the certificate holder's compliance with the requirements indicated on the manufacturer's label for leak testing of the PGLD devices. The certificate holder determined the PGLD devices were being controlled in accordance with regulations. The certificate holder stated the label was original to the manufacturer date in 1964, and the requirements of 10 CFR 30.21(c) as indicated on the label were no longer applicable to the PGLD devices and stated the section does not contain any leak testing requirements. The certificate holder restated their conclusion in corrective action ATRC 10-2946: since the devices were being used as gas/aerosol detectors, the PGLD devices are exempt from licensing in accordance with 10 CFR 30.15 and 10 CFR 30.20 and no further actions were required.

On February 17, 2011, the inspectors raised an issue after finding numerous PGLD devices lying about on top of the cell housings in building C-335. The cells had been shut down for several years and the devices were pulled and left in place. The inspectors questioned their control of the radioactive devices that were no longer in use. The certificate holder initiated corrective action ATRC 11-0444, "Radiological Storage/Housekeeping Practices" and determined the concern was only a

housekeeping issue and had no radiological significance. The certificate holder walked down other shutdown cells and found a similar condition with devices lying about and abandoned in place in other units in the building. The devices were collected by instrument maintenance personnel and the ATRC was closed as a result of the actions taken with no associated corrective action.

On February 28, 2011, the certificate holder completed corrective actions for the VIO documented in ADAMS Accession No. ML103090228 involving the improper waste shipment.

On November 16, 2011, the certificate holder initiated a corrective action ATRC 11-3076, "PGLD License Requirements," as a result of the NRC URI 2011-004-01 opened in the third quarter Inspection Report 70-7001/2011-004 (ADAMS Accession No. ML11299A158). In the URI, the inspectors questioned the certificate holder's disclosure of the radioactive materials in the PGLD devices, the use, and possession limits in the initial certificate application and request for materials. The inspectors noted Table 1-3 of the SAR, Possession Limits for NRC Regulated Materials and Substances, listed the limit for Americium-241 (atomic number 95) as 100 uCi and the PGLD devices were not included in the description section of the table. Table 1-4 of the SAR, Authorized Uses of NRC-Regulated Materials, listed the authorized use of Americium-241 for smoke detectors. On January 5, 2012, the certificate holder responded to the ATRC and stated the Am-241 in the PGLD devices was covered by the SAR with the intended use as smoke detectors and with no possession limit. The certificate holder stated their position that whether the radioactive material was or was not included in the SAR had no relevance since there are no licensing requirements for the PGLD use as smoke detectors. The certificate holder noted the term smoke detector was used synonymously with PGLD and PGLD gas detector throughout the SAR. The certificate holder restated the exemption in 10 CFR 30.20 and stated the label applied by the manufacturer of the PGLD devices was required by the manufacturer's specific license. The certificate holder stated the belief that the basis for the exemption of the devices can be found in NUREG-1717, "Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials" and NUREG-1556, "Consolidated Guidance About Materials Licenses, Program-Specific Guidance About Exempt Distribution Licenses, Vol. 8."

In the first quarter of 2012, the inspectors went to the instrument maintenance shop in Building C-331 where the PGLD devices were collected and stored, disassembled, cleaned, calibrated, serviced, and refurbished to perform direct inspection of the area. The inspectors requested the radiation surveys of the PGLD work bench and the associated areas where the PGLD devices were collected and serviced. The inspectors noted the instrument maintenance shop was surveyed for removal contamination on a quarterly basis but the surveys did not include the radiation levels and radioactive contamination levels for the PGLD work bench, cleaning sink, waste water collection areas, and other associated areas. The inspectors noted the instrument technicians performed hand and foot monitoring prior to leaving the instrument shop.

On February 10, 2012, the certificate holder received notice from their waste processing contractor (Perma-Fix of Florida) indicating that 12 PGLD devices were found in a waste shipment; the certificate holder was unaware that the PGLD devices (licensed material) had left the site. At the Perma-Fix of Florida waste processing

facility, the waste processor discovered the bagged 12 PGLD devices in the waste held for processing and notified the certificate holder. The certificate holder initiated a corrective action ATRC 12-0400, "Non-conforming Items When Processed for Disposal," and identified the shipment as improperly managed and shipped and non-conforming to their waste processing contract. The certificate holder had shipped the low-level waste shipment to Perma-Fix on August 22, 2011, that contained nine containers. Most of the containers were United States Department of Transportation (USDOT) exempt and contained radioactive contaminated solids and metals in large B-25 metal boxes and one SeaLand container. One of the containers contained radioactive material of low specific activity (LSA-1), fissile excepted, so the shipment was carried as an "Exclusive Use" shipment and the truck had the Class 7 radioactive placard. The B-25 container with the 12 PGLD devices did not have the 960 uCi of Am-241 included in the shipping papers. In addition, the container was labeled as USDOT exempted and not labeled as regulated radioactive material (LSA-1). The certificate holder acknowledged the PGLD devices were improperly managed and shipped.

In the response to the ATRC, the certificate holder noted the person/organization responsible for the improper managing of the devices could not be identified and various plant groups that had access to the devices may not have been informed as to the proper method for managing PGLD devices. The response noted improper disposal of the devices may occur during housekeeping and building clean-up activities not directly related to maintenance or operation of the PGLD devices. The certificate holder generated numerous work orders and actions to complete walk downs in the process buildings to locate any abandoned and uncontrolled PGLD devices and remove devices not in service from the areas. Crew briefings were conducted and expanded to more working groups of personnel from the site.

On March 5, 2012, during conduct of Nuclear Safety and Quality audit for cold weather readiness and UF₆ freeze-out prevention, the auditor noted a bagged PGLD device lying on the floor on the clean side of the contamination control zone (ATRC 12-0609, "Control for Removed PGLD Devices"). He questioned instrument maintenance personnel to determine what controls were in place to preclude the PGLD device from mistakenly being removed or placed in the wrong waste stream to prevent a repeat of the VIO 2010-003-02. The auditor noted collection receptacles for the devices was a corrective action from the violation and questioned if placement of the PGLD collection receptacles at the contamination control zone boundary may be appropriate. The auditor identified a weakness where a PGLD device was processed by health physics personnel for removal out of the contamination control zone but subsequently left uncontrolled on the clean side of the boundary and was not collected in an approved receptacle or physically turned over to qualified personnel. The response to the ATRC noted accumulation areas for the PGLD devices were located on both the clean side and in the contamination control zones and should be effective as long as plant personnel are aware of the requirements. The ATRC credited corrective actions planned in response to ATRC 12-0400 to close the ATRC with no additional corrective actions.

On September 27, 2012, the certificate holder initiated corrective action ATRC 12-2452, "Proposed Apparent Violation PGLD Usage Controls," in response to an AV posed by the inspectors at the quarterly exit meeting. In response to the ATRC, the

certificate holder re-stated their long standing position that the PGLD devices are exempted for users and the 10 CFR Part 20 requirements do not apply.

Regulatory Analysis

The inspectors determined the certificate holder erroneously identified the PGLD devices as exempt and therefore did not subject the devices to the radioactive materials controls and certificate requirements. The certificate holder managed the devices as if there were no associated regulatory requirements. The certificate holder assumed the PGLD devices were exempt under the provisions of 10 CFR Part 32. The inspectors performed direct observations of the devices and noted the sources possessed and used as PGLD devices were of three different types. On July 2012, the inspectors determined that the certificate holder possessed PGLD devices that were identified as Pyrotronics model-F3/5A, Pyrotronics model F/5B (both high voltage type), and Cerberus-Pyrotronics models DI-3, DI-4A, and DI-B3 (low voltage type). The inspectors noted that the observed low voltage devices were labeled in accordance with the requirements for exempt distribution devices as specified in 10 CFR Parts 32.15 and 32.29. The inspectors determined that high voltage devices were labeled in accordance with a GL issued by the Atomic Energy Commission (GL-133); the label indicated these devices could be only possessed under the specific requirements specified on the label or under a specific license authorizing their use. The certificate holder indicated that their use of these devices was inherent to the certificate that authorized operations (10 CFR Part 76) and not under the GL requirements; therefore, the certificate holder did not restrain their activities to the requirements specified in the GL. The inspectors determined that the activities associated with the PGLD devices were performed under the requirements of the certificate and therefore were not exempt from regulatory requirements.

The inspectors determined that the certificate holder's conclusions in ATRC 10-2946, "Evaluation of PGLD Detector Storage and Handling" and the succeeding corrective action reports were in error in that the PGLD devices were not controlled in accordance with applicable regulations. The certificate holder erroneously assumed the PGLD sources were used as gas/aerosol detectors pursuant to 10 CFR Parts 30.15 and 30.20. The inspectors determined that 10 CFR 30.15 was not applicable to the high voltage PGLD devices. The PGLD devices contained more than the limit specified in 10 CFR Part 30.15 of 1.0 uCi of Am-241 and the devices were not smoke detectors used to protect life and property from fires (see 10 CFR 30.15(a)(7)). The inspectors also concluded that the certificate holder's interpretation of the applicability 10 CFR 30.20 was in error because gas and aerosol detectors covered under this section include only detectors designed to protect life or property from fires and airborne hazards; most importantly, the devices must be manufactured, processed, produced, or initially transferred by a manufacturer with a specific license issued under 10 CFR 32.26, which authorizes the manufacturer and initial transfer of exempt sources. The PGLD devices were not manufactured, processed, produced, or initially transferred for exempt distribution by a manufacturer authorized under 10 CFR Part 32.26. The labeling of the PGLD devices indicates the sources were issued under a GL or a specific license and the devices were not exempt and were subject to regulatory requirements.

The requirements in 10 CFR 32.26 are provisions for the application for a license for gas and aerosol manufacturers to obtain a specific license to manufacture, process, produce, or initially transfer devices suitable for exempt distribution. Licensees pursuing this type of authorization (exempt distribution) must submit their application to the NRC using the guidance provided in NUREG-1556, "Consolidated Guidance About Materials Licenses, Program-Specific Guidance About Exempt Distribution Licenses, Vol. 8." NUREG-1556 discusses manufacturers could consider devices suitable for exempt distribution used as smoke detectors containing up to 1.0 uCi of Am-241, or chemical agent detectors containing up to 160 uCi of Am-241. When the exempt distribution license application is reviewed, the exemptions from licensing requirements are based primarily on a determination by the Commission that the exempted classes of products or types of uses will not constitute an unreasonable risk to the common defense or security or to public health and safety. Radiation safety is primarily dependent on safety features built into the sealed source or device or on restrictions on the amount of radioactive material that can be initially distributed. If the NRC safety evaluation concludes the devices can be distributed as exempt, the manufacturer would have been issued the exempt distribution license pursuant to 10 CFR 32.26. In addition, there would be no warnings and restrictions on the labels. As required in 10 CFR Part 32.29, the label would say "EXEMPT FROM ANY REGULATORY REQUIREMENTS." Also, the NRC uses NUREG-1717, "Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials," to conduct dose assessment of current exempt sources or proposed sources as part of their safety evaluation prior to authorizing the exempt distribution of sources. This regulatory guide is not intended for users of devices to determine which devices are automatically exempted because they meet the description/name criteria. The NRC does not use this criterion to exempt sources which were originally distributed under a GL or under a specific license. In the case of high voltage PGLD devices, the certificate holder was in error to use the regulatory guide to demonstrate exemption based on names or uses of devices discussed in the guide. Therefore, with the exception of PGLD devices which are clearly marked pursuant to 10 CFR Part 32.29 requirements as exempt sources, all other PGLD devices under the certificate holder's control, are to be possessed and used in accordance with their certificate and are not to be considered exempt from NRC regulatory requirements.

c. Apparent Violations Identified

(1) Loss of Control of Radioactive Material (AV 70-7001/2012-005-01) (OPEN)

The inspectors identified an AV of 10 CFR 20.1802 for the failure to control or maintain constant surveillance of the licensed material in the PGLD devices. As a result of the failure to maintain control or constant surveillance of the devices, on August 22, 2011, the certificate holder lost control of twelve PGLD devices each containing 80 uCi of Am-241 (960 uCi total). The certificate holder unknowingly shipped the devices in commerce to their waste processor who identified the radioactive material.

The inspectors concluded that the certificate holder's failure to control or maintain constant surveillance of licensed material contained in the PGLD devices that unknowingly left the plant site in a waste shipment to be an AV. The AV could be determined to be of regulatory and safety significance because the aggregate

quantity of the Am-241 was greater than 1000 times the quantity specified in Appendix C of 10 CFR 20 (see NRC Enforcement Policy Section 6.7.c.10.(a) for additional information). Also, the deficiency can be determined to be safety significant because if the failure to control the PGLD devices throughout the site is left uncorrected, a more significant safety concern could exist and have the potential to allow the continued inadvertent and unknowing disposal of the Am-241 sealed sources.

d. Improper Waste Shipment of Radioactive Material (AV 70-7001/2012-005-02) (OPEN)

The inspectors identified an AV of Title 10 Part 71, 49 CFR 171, Subpart A (Section 171.2(e)); and 49 CFR 172, Subpart C (Sections 172.202(a) and 171.202(b), and 172.203(d)), Subpart D (Section 172.302(a)), and Subpart E (Section 172.403) for the improper shipment of the PGLD devices to a waste processing facility. On August 22, 2011, the certificate holder improperly shipped radioactive material in 12 PGLD devices each containing 80 uCi of Am-241 (960 uCi total) as an exempted package in commerce. Specifically, the package was not properly classed as regulated radioactive material, was not described in the shipping papers to denote the material and activity, and was not properly marked and labeled.

The inspectors determined the certificate holder's failure to account for the Am-241 radioactive material in the shipment to be safety significant because shipments of improperly classed material, improper shipping papers, improperly marked and labeled containers could preclude emergency responders to take adequate actions in case of emergency. The radioactive material was offered for transportation in commerce that was not properly classed, described, marked, and labeled as required or authorized by applicable requirements or an exemption from 49 CFR Parts 172-174. (see NRC Enforcement Policy Section 6.8.d.4 for additional information).

e. Failure to Perform Leak Testing of the PGLD Devices (AV 70-7001/2012-005-03) (OPEN)

The inspectors identified an AV of 10 CFR 20.1101 and Section 5.3, "Radiation Protection," of the SAR for the failure to perform leakage testing on alpha emitting sources (e.g., Am-241) of activity greater than 10 uCi. Specifically, the certificate holder failed to test for leakage approximately 3,500 devices in use. The certificate holder reported no record of ever having performed leak testing of the devices.

The inspectors determined the certificate holder's failure to perform leak testing of the radioactive sources in the PGLD devices to be an AV. Specifically, the PGLD devices were not leak tested for Am-241 contamination. The AV could be determined to be of safety significance because of the large number of PGLD devices that have not been leak tested for an extended period. In addition, since Am-241 contamination has been detected in the waste water from the refurbishment and cleaning processes, indicating that some of the PGLD devices could be leaking. The leaking sources were not identified and removed from service (see the NRC Enforcement Policy Section 6.7.d.4, for additional information).

f. Failure to Perform Inventory of the PGLD Devices (AV 70-7001/2012-005-04) (OPEN)

The inspectors identified an AV of 10 CFR 20.1101 and Section 6.2.4 of the certificate holder's procedure CP2-HP-RP1046, "Sealed Radioactive Source Control," for the failure to perform physical inventory of radioactive sources contained in the PGLD devices for approximately 4,800 devices.

The inspectors determined the certificate holder's failure to perform physical inventory to account for the radioactive sources in the PGLD devices to be an AV. The certificate holder has not maintained records or listing documents to identify each PGLD device by unique identifier or serial number. In addition, the certificate holder did not know how many PGLD devices were actually possessed and did not know the number of devices in various locations throughout the plant site, for approximately a total 4,800 devices, including devices in use and storage. The AV could be determined to be safety significant because failure to perform physical inventories could be a contributor to the lack of controls resulting in AV 70-7001/2012-005-01 described above (see NRC Enforcement Policy Section 6.7.d.3 for additional information).

g. Failure to Perform Surveys to Assess Radiological Hazards Associated with PGLD Maintenance Activities (AV 70-7001/2012-005-05) (OPEN)

The inspectors identified an AV of 10 CFR 20.1501 for the failure to perform surveys to assure compliance with limits for worker radiation exposure to Am-241 and to assess the radiological hazards associated with installation and removal, maintenance, cleaning, refurbishment, and the testing/calibration of PGLD devices. Specifically, the certificate holder did not conduct radiation level surveys and contamination surveys in the workbench areas and of the equipment handled in the disassembly, maintenance, cleaning and washing, refurbishment, and testing and calibration of the PGLD devices to demonstrate the compliance with the dose limits of 10 CFR 20.

The inspectors determined that the certificate holder's failure to perform work support surveys for the PGLD maintenance activities could be safety significant because PGLD devices have not been tested for leakage and could be leaking contamination. Specifically, Am-241 has been detected in the waste water from the maintenance and cleaning of PGLD devices (see the NRC Enforcement Policy Section 6.7.d.3 for additional information).

h. Failure to Label Several PGLD Devices (AV 70-7001/2012-005-06) (OPEN)

The inspectors identified an AV of 10 CFR 20.1904 for the failure to ensure several PGLD devices were properly labeled with the radioactive material warnings and prohibitions and statements to provide sufficient information to permit individuals handling or using the devices to take precautions to avoid or minimize exposure. Specifically, several PGLD devices did not bear a label that identified the Am-241 radionuclide or the quantity of radioactivity, nor did it otherwise bear the words "CAUTION, RADIOACTIVE MATERIAL," or "DANGER, RADIOACTIVE MATERIAL."

The inspectors determined the certificate holder's failure to ensure the PGLD devices were labeled to identify the radiologic hazards and precautions to be an AV of 10 CFR 20.1904. The AV could be safety significant because without the label, PGLD devices have no markings to indicate that the devices contain radioactive materials that require special handling. In addition, the certificate holder did not know how many PGLD devices were missing the labeling. The absence of the labeling of the PGLD devices, if left uncorrected, could contribute to a more significant safety concern because failure to label devices could contribute to the inadvertent disposal or mishandling of licensed materials similar to the circumstance identified in AV 70-7001/2012-005-01 described above (see NRC Enforcement Policy Section 6.7.d for additional information).

D. Exit Meeting

The inspection scope and results were discussed on January 25, 2013, with Mr. M. Buckner, Acting General Manager at the quarterly exit meeting and on November 8, 2012, with certificate holder's staff. The certificate holder acknowledged the issues presented. The inspectors confirmed no proprietary information was identified. Proprietary information was discussed but not included in the report.

SUPPLEMENTAL INFORMATION

1. List of Persons Contacted

Name	Title
M. Atkins	Front Line Manager, C-331
B. Arnett	Front Line Manager, C-333
K. Beasley	Fire Chief
M. Boren	Regulatory Compliance and Nuclear Operations
M. Buckner	Plant Manager
S. Childers	Quality Control Manager
S. Cornwell	Front Line Manager for Fire Services
D. English	Nuclear Safety and Quality Manager
L. Fink	Regulatory Engineer
J. Gosha	Building Manager, C-360
S. Gunn	Operations Manager
T. Henson	Nuclear Criticality Safety Manager
O.E. Hickman	Radiation Protection Manager
M. Hayden	Building Manager, C-333
D. Howard	Fire Major (Day Shift Manager)
M. Keef	Field Services Manager
J. Lewis	Vice President and General Manager
J. Lambert	Authority Having Jurisdiction (AHJ) Fire Protection Engineer
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
E. Walker	Front Line Manager, C-337
C. Willett	Maintenance Manager

2. List of Documents Reviewed

Procedures

CP2-SH-IS-2030, Storage and Handling of Compressed Gas Cylinders, Revision (Rev.) 10
CP2-SS-FS-1038, Combustible Storage in Process Buildings, Rev. 2
CP4-SS-FS-6210, Fire Services Vehicle Inspections, Rev. 4
CP4-HP-RP-2101, Performance of Radiological Surveys, Rev. 7
CP2-HP-RP-1046, Sealed Radioactive Source Control, Rev. 2
CP4-HP-RP-2106, Posting and Tagging Requirements, Rev. 7
CP4-HP-RP-2102, Radioactive Source Control, Rev. 5

Records

HPFWS Corroded Sprinkler Head Quarterly Report, dated July 16, 2012
 History Report for Monthly Ambulance Inventory Training and Development and
 Administrative Guide (TDAG) for Fire Services, Rev. 1, dated June 18, 2008
 Hot Work Permit, Safety & Health Work Permit, 12-360-32
 Engineering Notice, Effect of Impaired Sprinkler Heads on System Operability, dated
 January 12, 2000

Assessment & Tracking Report Paducah (ATRC)

ATRC-12-2306, ATRC-12-2795, ATRC-12-2804, ATRC-12-2805, ATRC-12-2810,
 ATRC-12-2811, ATRC-12-2813, ATRC-12-2849

Work Orders/Requests

5164636/1218340
 5164867/1218593
 5164869
 5164473
 SOW-841-1115, Sprinkler Head Replacement Services in C-310, Rev. 0
 SOW-840-902, Statement of Work for ESO ZA9620, Rev. 1
 SOW-822-1151, Rev. 0

3. List of Items Opened, Closed, and DiscussedOpened

07007001/2012-04-00	LER	EN 48522: Failure of the C-409 Criticality Accident Alarm System Uninterruptable Power Supply
07007001/2012-03-00	LER	EN 48398: Failure to Maintain Double Contingency for Cylinders Prior to Filling (Hydrocarbon Testing)
07007001/2012-005-01	AV	Loss of Control of Radioactive Material
07007001/2012-005-02	AV	Improper Waste Shipment of Radioactive Material
07007001/2012-005-03	AV	Failure to Perform Leak Testing of the PGLD Devices
07007001/2012-005-04	AV	Failure to Perform Inventory of the PGLD Devices
07007001/2012-005-05	AV	Failure to Perform Surveys to Assess Radiological Hazards Associated with PGLD Maintenance Activities
07007001/2012-005-06	AV	Failure to Label Several PGLD Devices
07007001/2012-005-07	URI	C-360 Autoclave/Cylinder Tilt Mechanism Failure

Opened and Closed

None

Closed

07007001/2011-003-00	LER	EN 46996: Failure of High Pressure Fire Water Pump #2 to Realign
07007001/2011-002-02	VIO	USEC-PGDP Failed to Notify the NRC Within 24 Hours of an Unplanned Contamination Event
07007001/2011-010-00	LER	EN 47531: Possible Degradation in High Pressure Fire Water Sprinkler Heads
07007001/2011-004-01	URI	Process Gas Leak Detector(PGLD) General License Requirements

Discussed

70-7001/2012-003-01	VIO	Failure to Follow Procedures to Ensure Clear Path
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4. List of Inspection Procedures Used

88100	Plant Operations
88102	Surveillance Observations
88103	Maintenance Observations
88105	Management Organization and Controls
88054	Fire Protection Triennial
88055	Fire Protection Annual

5. List of Acronyms Used

AC	Alternate current
ADAMS	Agencywide Documents Access and Management System
AQ	Augmented Quality
ATRC	Assessment & Tracking Report (Paducah)
AV	Apparent Violation
CAAS	Criticality Accident Alarm System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
EN	Event Notice
FHA	Fire Hazard Analysis
GL	General License
gpm	Gallons per Minute
HPFWS	High Pressure Fire Water System
IP	Inspection Procedure
LCO	Limiting Condition of Operation
LOTO	Log-out/Tag-out

LSA	Low Specific Activity
NCS-AQ	Nuclear Criticality Safety Augmented Quality
NCSE/A	Nuclear Criticality Safety Evaluation/Approval
No.	Number
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
PEC	Pre-decisional Enforcement Conference
PGLD	Process Gas Leak Detector
PORC	Plant Operations Review Committee
PSS	Plant Shift Supervisor
Q	Quality
Rev.	Revision
SAR	Safety Analysis Report
SOW	Statement of Work
TDAG	Training and Development and Administrative Guide
TSR	Technical Safety Requirement
uCi	microcurie
UF ₆	Uranium Hexafluoride
UPS	Uninterruptable Power Supply
URI	Unresolved Inspection Item
USDOT	United States Department of Transportation
USQ	Unreviewed Safety Question
VIO	Violation