USEC
A Global Energy Company

May 6, 2005
GDP 05-1018

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001, Certificate No. GDP-1
Report: PAD-2005-07

Enclosed is the final report pertaining to the actuation of a zone 1 Process Gas Leak Detection (PGLD) head in the C-360 Toll Transfer and Sampling Facility on March 6, 2005. The Nuclear Regulatory Commission (NRC) was verbally notified in accordance with the Safety System Actuation reporting criteria in PGDP SAR 6.9 and NRC No. 41378 was assigned to the notification. The event notification was subsequently retracted on March 24, 2005, because it was determined that the detector head was actuated by an incidental UF_6 leak from the deteriorated packing on a valve in the 5/8-inch UF_6 sample line located inside a heated sample cabinet in the C-360 laboratory. This written report is being submitted to the NRC because discussion with the NRC of the Safety System Actuation reporting criteria (SAR 6.9 Table 1. criteria J.2) has revealed that there is not a common understanding between NRC and USEC of the current reporting criteria wording.

Since initial Certification, USEC's understanding of the reporting criteria is that the NRC is notified when "Q" systems actuate to mitigate the consequences of the condition that the system is credited to protect against. USEC does not believe the reporting criteria in the SAR Table 6.9-1 requires the reporting of any "Q" system actuation when the condition that the system is credited to protect against, i.e., a condition which would result in the "Q" classification, did not exist. The Zone 1 PGLD system's safety function is to limit the release from a cylinder pigtail/line rupture to less than the accident analysis Evaluation Guidelines for the assigned Evaluation Basis Event by isolating the UF_6 cylinder from the line rupture and is thus classified as "Q". The type of incidental leak described in this report is an anticipated event in the PGDP accident analysis. In this instance the UF_6 detector was actuated by an incidental release from a valve packing, not a pigtail/line failure. The incidental release from a valve packing is not a condition that would result in a Zone 1 PGLD system classification as a "Q" system. Based on this understanding the event notification was retracted.

NMSS01

United States Enrichment Corporation
Paducah Gaseous Diffusion Plant
P.O. Box 1410, Paducah, KY 42002

USEC intends to revise the wording of the Safety System Actuation reporting criteria to clarify its intent. There are no commitments contained in this report. Any questions regarding this matter should be directed to Steve Cowne at (270) 441-6796.

Sincerely,

Steven R. Penrod
General Manager
Paducah Gaseous Diffusion Plant

Enclosures: As Stated

cc: NRC Region II Office
NRC Resident Inspector - PGDP

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REPORT
PAD-2005-07

A. Description of Event

On March 06, 2005, at 1140 hours, the Plant Shift Superintendent (PSS) was notified that the C-360 Toll and Transfer Facility Zone 1 (Laboratory) Process Gas Leak Detector (PGLD) system had actuated. The two Operators in the lab at the time of the actuation responded to the alarm and followed the plant "see and flee" policy and evacuated to the proper assembly point. The UF_6 PGLD system isolated the UF_6 cylinder as designed. The Emergency Squad entered the building and sampled for Hydrogen Fluoride (HF). Sample results were positive inside autoclave 4 sample cabinet pipe galley. The pipe galley is located between the sample cabinet and the autoclave. The autoclave and sample cabinet UF_6 lines were evacuated and purged. Health Physics surveyed the lab and found no contamination.

The two Operators working in the lab at the time of the actuation stated that they did not smell anything or observe any smoke. Precautionary urine samples were submitted.

B. Description of Equipment Failure

Valve PL-437 is a ½-inch Swagelok/Nupro globe valve, which is part of the UF_6 sample transfer line between the autoclave and sample cabinet. Examination of the valve after removal revealed that a small leak in the packing between the bonnet and body of the valve caused the actuation of the Zone 1 PGLD.

C. Exact Location of Event

Building C-360 (Toll and Transfer Facility) Zone 1.

D. Description of Isotopes, Quantities, and Chemical and Physical Form of the Material Involved

Uranium Hexafluoride (UF_6) in very small quantities.

E. Causes of the Event

1. Direct Cause of the Event

The direct cause of this event was the failure of the packing between the bonnet and the body of the PL-437 globe valve located in the sample cabinet pipe galley. The small amount of UF_6 that escaped actuated the PGLD system.

2. Root Causes of the Event

The root cause of the event is an insufficient amount of support for the valve and the actuator in the pipe galley. The current design for the pipe galley does not allow space to adequately support the actuator and valve such that with continued operation of the valve, the packing becomes weakened and is prone to leak.

The same valve and actuator are currently in operation in the C-310 updated design sample cabinets and have not experienced any instances of UF_6 releases.

F. Corrective Actions Taken

On March 8, the valve and actuator for PL-437 were replaced under Work Order Task 0503519-01.

G. Corrective Actions Planned

By June 15, 2006, modifications to the sample cabinets including the support brackets will be completed. An Engineering Service Order (ESO) has been approved to upgrade the sample valve cabinets in C-360, which house the five ½-inch Swagelok/Nupro globe valves. The ESO installs a larger cabinet on each of the 4 sample stations including support brackets for the valves similar to the cabinets installed in the C-310 sampling system.

H. Results of Any Evaluations or Assessments

None

I. Extent of Exposure of Individuals to Radiation or to Radioactive Material

The two employees who submitted urine samples after the release had urine concentrations of 7.3 µgU/L and 5.2 µgU/L respectively. Subsequent samples were below the follow-up recall limit. 7.3 µgU/L corresponds to an uptake of less than 0.1 mg of soluble Uranium, which is below the 10CFR20 limit of 10mg soluble Uranium per week.

J. Lessons Learned

N/A