



August 7, 1998
GDP 98-1061

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

Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001
Event Report ER-98-21

Pursuant to 10CFR76.120(d)(2), enclosed is the required 30-day written event report covering the process gas leak detector (PGLD) supply power interruption in Building C-310. The Nuclear Regulatory Commission (NRC) was notified of the event on July 9, 1998 (NRC No. 34498). Investigation activities are continuing to determine the root cause and recommended corrective actions for this event. A revised report is planned for submission by September 18, 1998.

Any questions regarding this matter should be directed to Larry Jackson at (502) 441-6796.

Sincerely,

Keith. Allen For H.P.

Howard Pulley
General Manager
Paducah Gaseous Diffusion Plant

Enclosures: As Stated

cc: NRC Region III Office
NRC Resident Inspector - PGDP

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EVENT REPORT
ER-98-21

DESCRIPTION OF EVENT

On July 8, 1998, at approximately 0958 hrs., the Normetex pump process gas leak detector (PGLD) power supply was interrupted when the circuit breaker supplying 110 volt power to the system tripped in Building C-310. A buffer alarm was received in the area control room (ACR). The Plant Shift Superintendent (PSS) declared the Normetex PGLD system inoperable. Operations personnel initiated immediate steps according to procedure and a smoke watch was established in accordance with Limiting Conditions For Operation (LCO) 2.3.4.3.A-1. At approximately 1010 hrs., the circuit breaker was reset, power restored, and the PSS declared the system operable at approximately 1033 hrs. On July 9, 1998, at 0128 hrs., the Nuclear Regulatory Commission Headquarters (NRC-HQ) operations office was notified of this event in accordance with 10CFR76.120(c)(2).

At the time of the event, an instrument and calibration (I&C) technician plugged a Fourier Transform Infrared (FTIR) buggy into an instrument power receptacle located on the rear of cell cubicle 8. Normally, FTIR buggies are plugged into electrical receptacles located on the columns to the rear of the cell; however, the employee noticed that there was standing water on the floor in the vicinity of column 8. Because of the presence of water on the floor, the employee believed that it would be unsafe to connect the buggy to column 8 and chose to plug into the instrument power electrical receptacle on the rear of the cell. When the buggy was plugged into the receptacle the employee heard an alarm. After cleaning up the water, the employee disconnected the FTIR from the cell cubicle receptacle; reconnected using the receptacle located in the column; and proceeded to assist Operations personnel in determining the cause for the alarm. While investigating the cause for the buffer alarm, it was discovered that two power indicating lights were not illuminated on the PGLD system panel. They noticed that an electrical breaker had been cautioned tagged indicating that operation of the breaker could effect power to the PGLD system. It was difficult to determine the position of the breaker because of the caution tag. However, the breaker appeared to be approximately 1/8-inch off the normal position. The caution tag was moved and the breaker immediately moved to the tripped position confirming that a trip had occurred.

The Normetex PGLD electrical circuit is shared by instrument electrical power receptacles located in cell cubicles 7, 8, 9, and 10. FTIR buggies were connected to instrument power receptacles at cells 8 and 10. This is in addition to other electrical loads, such as buffer photohelics, on the system which overloaded the circuit and caused the circuit breaker to trip. When the buffer alarm came in all FTIR buggies, with the exception of the buggy located at cell 7, were disconnected and reconnected to an alternate power supply. After re-establishing power to cell 7, the FTIR buggy was reconnected to an alternate power supply located behind cell cubicle 5.

Beginning in 1995, there have been Significant Condition Adverse to Quality (SCAQ) investigations initiated as a result of circuit breaker trips caused by plugging equipment into power receptacles that also supply power to safety systems. Among the safety systems affected were PGLDs, criticality accident alarm systems (CAAS), and freezer/sublimator (F/S) control power. In February 1996, the Management Assessment & Analysis Team (MAAT) approved the corrective action plan for SCAQ PR-CO-95-1239. This SCAQ was generated as a result of a sample buggy plugged into a receptacle at a cell buffer panel causing a breaker to trip interrupting power to the PGLD system. The corrective action plan included modifications to pertinent procedures to avoid use of spare outlets in the cell panel, or cell buffer panel, for power to sample buggies in Buildings C-331, -333, -335, and -337; installation of plastic safety plugs to cover unused outlets and painting the safety plugs red; and attaching a "Do Not Use" label. On September 16, 1996, a determination was made that SCAQ PR-CO-95-1239, "was inadequate and did not address the global issue of inadvertent loss of power to safety equipment." Therefore, with the concurrence of MAAT, the six original corrective actions were canceled and replaced by six new corrective actions that included completion of an evaluation to determine if an Engineering Service Order (ESO) was needed to install additional 110-volt AC outlets. Engineering Evaluation, EV-C-813-96-06 concluded that the need for "additional outlets was not needed for power to the portable analytical buggies or for electrical tools in the vicinity of the cell panel." The evaluation recommended use of extension cords, properly sized to carry the load, or extension of existing outlet circuits for outlets mounted next to lighting panels nearest the cell panels, be utilized.

SCAQ PR-CO-95-4883, was initiated as a result of the loss of all ground floor power in Building C-315, with the exception of the withdrawal room. This electrical outage occurred as a result of the operation of a stove in a break room overloading an electrical circuit. In April 1996, MAAT approved a corrective action plan which included a requirement to develop an ESO requesting an engineering analysis on distribution panels in all other areas of the plant which supply electrical power to safety systems. Further, the ESO would evaluate the panel loading condition and include field walkdowns to verify the as-built status of drawings. This resulted in the initiation of ESO Z96620. In March 1997, MAAT approved cancellation of ESO Z96620, along with all corrective actions associated with this ESO. Justification for the cancellation was "the root cause for this SCAQ has been addressed and measures have been taken to prevent future problems. All safety systems which have receptacles have been labeled and no safety system trips have occurred since these receptacles were labeled."

In June 1996, a problem report (PR-SU-96-3310) was generated as a result of an electrical circuit breaker trip in Building C-333. The trip was caused by connecting a test buggy to a receptacle at Unit 5, Cell 3 which overloaded an electrical circuit affecting the operability of PGLD heads. When the power cord was removed from the cell and the breaker reset, power was restored. The problem report indicated, "there is no action plan available."

SCAQ PR-CO-96-2608, was initiated due to the loss of the main power supply to a F/S in Building C-337, because of a portable fan plugged into a power strip located in a cell cabinet. In July 1996, MAAT approved a corrective action plan that included initiation of an ESO (Z91460) to provide a new dedicated source of AC power for each PGLD signal conditioner in Buildings C-331, -333, -335, and -337. Additionally, a dedicated source of power for PGLD systems will be added for Buildings C-310, -315, -333-A, -337-A, and -360 where one is not already present. The expected date for completion of dedicated source of power for Building C-310 is March 1999.

All requests to cancel SCAQs were made to the MAAT following approval by the functional manager as the issue owner.

During the period 1995-1996, the corrective actions which were generated in response to the SCAQs generally did not address generic safety system issues in buildings other than C-331, -333, -335, and -337. The exception was SCAQ PR-CO-95-4883, which was generated as a result of the power loss to all ground floor lighting in Building C-315, with the exception of the withdrawal room. As a result of an action step in SCAQ PR-CO-95-4883, plant procedure CP3-GP-GP1109, "Configuration Control Program for Q, AQ, and AQ-NCS Structures, Systems, and Components," was changed on January 16, 1998. Included in the procedure change was an action step to ensure receptacles/power strips, field labeled as dedicated for PGLD, or F/S, are not to be used for other electrical power supply purposes. Additionally, a caution statement was added which warned that use of electrical outlets labeled as dedicated for PGLD and F/S could cause a circuit overload and trip a breaker providing power to a Q, AQ-NCS, or AQ-SSC. At the time of this event, there was a caution tag attached to the tripped breaker that stated "Do Not Use Without FLM Permission. May Affect PGLD Systems For Normetex Pumps." However, a caution tag was not attached to the power strip receptacle where the FTIR was plugged.

The corrective action process that existed prior to March 1997, did not contain the necessary rigor to assure corrective actions were effectively implemented and verified. Additionally, the process of tracking corrective actions had not reached the requisite quality necessary to assure that changes, deletions, or closures, were cross-referenced to determine the impact on subsequent investigations. Plant procedure CP2-BM-CI1031, "Corrective Action Process At PGDP," with an effective date of March 23, 1998, defines the management process for identifying off-normal conditions through the Assessment and Tracking Report (ATR) reporting system. This procedure defines the corrective action process including assigning, validating, implementing, verifying, and closing issues derived from the ATR system. There has been an increase in cross-reference issues and corrective actions. Compliance with this procedure will minimize the possibility of recurrence of ineffective corrective actions, as well as the absence of corrective actions discovered during this investigation.

The safety significance of this event was the loss of power to the PGLD for approximately 12 minutes which affected the ability to detect a UF₆ release.

CAUSE OF EVENT

A. Direct Cause

The direct cause for this event was the loss of power to the PGLD as a result of an electrical circuit breaker trip. Plugging the FTIR buggy into the receptacle, which was not labeled according to procedure, overloaded the electrical system.

B. Root Cause

Being Determined

CORRECTIVE ACTIONS

A. Completed Corrective Actions

1. On July 7, 1998, caution tags were attached to electrical power strip receptacles in Building C-310 prohibiting use of the receptacles without permission of the Operations Front-Line Manager (FLM).
2. On August 4, 1998, the manager of Safety, Safeguards, and Quality addressed MAAT relative to this event and the necessity to ensure that effective corrective actions are implemented.

B. Planned Corrective Actions

Being Determined