U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-237/92028(DRS); No. 50-249/92028(DRS)

Docket Nos. 50-237; 50-249 Licenses No. DPR-19; No. DPR-25

Licensee: Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Dresden Nuclear Power Station - Units 2 and 3

Inspection At: Dresden Site, Morris, IL 60450

Inspection Conducted: October 26, 1992, through January 4, 1993

Inspectors: Z. Falevits — Date: 1-15-93

R. Winter — Date: 1/15/93

Approved By: R. N. Gardner, Chief, Plant Systems Section — Date: 1/15/93

Inspection Summary

Inspection on October 26, 1992, through January 4, 1993 (Reports No. 50-237/92028(DRS); No. 50-249/92028(DRS))

Areas Inspected: Announced inspection of previously identified items; Licensee Event Reports LERs; fuse control program; 125Vdc ground detection process; design changes for physical separation and control room annunciators; design basis program; and modifications (37700).

Results: Of the seven areas inspected, two apparent violations were identified: (1) failure to follow existing procedures requiring entry into an administrative LCO and the isolation and removal of 125Vdc system grounds (Paragraph 4.2); and (2) failure to promptly replace oversized fuses which could result in miscoordination and damage to safety related components and circuits (Paragraph 4.3). One non-cited violation was identified during reviews of cable separation (Paragraph 4.5).

During the course of the inspection, the following were noted:

- Licensee progress to closeout remaining EDSFI items was satisfactory.
- Design basis program, master equipment list upgrade program and component classification program were considered good management initiatives.
- Fuse control program appeared to need increased management involvement.
- Procedures to enter administrative LCOs, locate and isolate 125Vdc grounds were not consistently followed.
- Proposed design changes to control room annunciators appeared appropriate and should improve reliability of control room annunciators.
- Modification process was detailed and comprehensive for the packages reviewed.

DETAILS

1.0 Principal Persons Contacted

Commonwealth Edison Company (CECo)

*J. Kotowski, Production Superintendent
H. Massin, BWR Systems Design Superintendent
*J. Gates, Assistant Technical Staff Supervisor
+*E. Carroll, Regulatory Assurance, NRC Coordinator
*D. VanPelt, EDSFI Director
*B. Viehl, Nuclear Engineering Department Site Supervisor
+*R. Sparks, Technical Staff Engineer
*D. Barrett, Supervisor, Quality Verification
S. Dileto, CECo BWR System Design

U. S. Nuclear Regulatory Commission (NRC)

W. Rogers, Senior Resident Inspector

*Denotes those present during the initial exit meeting on December 11, 1992.

+Denotes those participating in the exit telecon on January 4, 1993.

2.0 Licensee Event Reports (LERs) Followup

a. (Closed) LER 249/92-004: Inadequate calculation to determine degraded voltage relay trip setpoint put plant in an unanalyzed safety condition. The electrical distribution system functional inspection (EDSFI) team determined that the degraded voltage setpoint was set too low to adequately protect safety related motors during a LOCA concurrent with a degraded voltage condition that hovered above the degraded voltage relay setpoint (3708 to 3784 volts).

The licensee performed a voltage drop calculation for the assumed worst-case 480 volt motor load (Unit 2, Division 2, diesel generator cooling water pump (DGCWP)). The DGCWP critical starting and running voltage requirements at the 4160 bus were 3960 and 3950 volts, respectively. Compensatory measures were initiated until new degraded voltage setpoints were established in early 1992. The new setpoint calculations were developed using current setpoint techniques. The inspectors reviewed the new setpoint calculations and found them to be acceptable. This item is considered closed.

b. (Closed) LER (237/91-013, Revision 1): 250 VDC battery discharge voltage below acceptance value. The licensee added four additional battery cells to the 250 Vdc battery and conducted a battery performance test that verified that the battery terminal voltage did not drop below the 210 Vdc level during the crucial first six minute period, when many large loads were added. This item is considered closed.

c. (Closed) LER (237/91-017): Spurious closure of AC solenoid operated primary containment isolation valves during fast bus transfers. The isolation valves close when power is removed from their solenoids. During fast bus transfers (approximately 83.35 msec), the spurious closing of Group II isolation valves was increasing. The licensee identified that several GE type 12HMA111B9 relays were dropping out during the transfer. Testing identified the HMA relay drop out time was approximately 100 msec.

The licensee replaced the Unit 3 HMA relays with GE type 12HGA17S63 relays. The measured drop out times of the HGA relays were greater than 300 msec. Similar relays in Unit 2 will be replaced during the next refueling outage. This item is considered closed.

3. Action on Previously Identified Inspection Findings

a. (Open) Unresolved Items (237/91038-05(DRS) and (249/91038-06(DRS)): Adequacy of cable ampacity of some cables routed in safety related and balance of plant (BOP) cable trays had not been confirmed. Approximately 953 cable tray routing points were identified as potentially thermally overloaded.

The licensee performed an analysis which consisted of taking a sample of 10 (five from each unit) cable tray routing points believed to represent the worst case thermal conditions. The actual full load current on power cables was used rather than the original conservative current value which was based on cable size. The control cables were considered as a negligible heat load and deenergized. The thermal margin was the additional number of power cables that could be added without exceeding the present SLICE calculated ampacity values. Preliminary results showed that evaluation of engineering assumptions and replacing conservative assumptions with actual current values reduced the number of potentially overloaded routing points but did not eliminate the potential for individual cables to be thermally overloaded. On November 12, 1992, the licensee took field current and

temperature measurements on the worst case tray. The licensee extrapolated these external temperatures to get an estimate of the internal cable temperatures. However, the inspectors noted inconsistencies in the methodology used which could leave doubt whether the thermal overload conditions could be easily resolved. If cable ampacity is found to be inadequate, allowable conductor temperatures could be exceeded. Higher temperatures could degrade the cable insulation and its ability to withstand the 40 year design life and accident load conditions. Pending licensee evaluations, experimental results and NRC review, this item will remain open.

b. (Closed) Open Item (237/91023-05(DRP)): Adequacy of cable ampacity with thermal overload has not been confirmed. This item will be followed by unresolved items (237/91038-05(DRS) and (249/91038-06(DRS)). This item is considered closed.

c. (Open) Open Item (237/91038-06(DRS): The EDSFI team found the Unit 2/3 EDG room to be excessively hot. The licensee committed to monitor the 2/3 EDG room temperature each shift. During the period of August 17 to September 28, 1992, the cabinet mounted thermometer was removed and other thermometers were used; however, 51 shift readings were not taken. The licensee will evaluate whether readings taken during this second period were comparable to previous temperature readings and if the missed readings during this period would require more data be taken to reach an engineering evaluation.

No violations or deviations were identified.

4.0 Electrical Systems Reviews

4.1 Control Room Annunciator System Design Changes

The inspectors reviewed the licensee's special investigation reports for General Station Emergency Procedure (GSEP) events and the proposed design changes and corrective actions to prevent recurrence. Each of the reports dealt with instances where the control room annunciators were lost. No concerns were noted with the proposed modifications. The inspectors were informed that the Unit 2 modification will be completed during the 1993 outage and Unit 3 during the 1994 outage. The inspectors determined that, when implemented, these actions should improve the design and reliability of the annunciator system.

4.2 Review of 125Vdc Ground Detection and Isolation Process

During the review of past control room annunciator failures, the inspectors noted that on September 22, 1991, all Unit 3 control room annunciators were lost when an undersized fuse blew. The potential cause for this event was attributed to intermittent grounds in the 125Vdc system. Further NRC review of ground detector charts revealed that on September 26, 1992, the Unit 3 125Vdc ground detector recorder indicated a full 125Vdc ground on the system. This ground was present for approximately 7 hours. The Operator's Log also documented the 125Vdc battery ground. Procedure DOP 6900-07, Revision 9, "125 Vdc ground detection", required that at DC grounds above 60Vdc, the procedure be immediately implemented. For a ground above 115Vdc, the procedure required that a 14 day time clock (administrative LCO) be entered and actions be taken to locate the ground and remove it. The procedure further stated that if the ground could not be located within 14 days or if it was located but could not be isolated to permit repair, a Justification for Continued Operation (JCO) be prepared. In addition, Procedure DAP 07-05, Revision 9, "Operating Logs and Records", Paragraph B.5, required that when a Limiting Condition for Operation (LCO) entry condition occurs, the event will be logged in the LCO Log. However, no entry for this ground condition on Unit 3 was made on the LCO Log and no Work Request was written to identify and remove the ground.

The inspectors also noted that on November 3, 1992, 125Vdc grounds were present in both Units 2 and 3 for approximately 7 hours. Work Requests (WRs) D13806(U2) and D13836(U3) were written and the event was logged in the LCO Log for Unit 3 only. The Unit 3 WR and the LCO Log indicated that the ground was on bus 3A-2, circuit #16. The LCO was exited on November 6, 1992; however, the licensee could not provide evidence that Procedure DOP 6900-07, Revision 9, was performed or that actions were taken to identify and remove the grounds.

On November 12, 1992, a 125Vdc ground was present in Unit 3 as evidenced by the LCO Log entry that indicated that the ground was again on bus 3A-2, circuit #16. The ground detection procedure was not performed and no WR was issued to locate and remove this ground. On November 16, 1992, work request D14129 was written to document a 90Vdc ground on Unit 3. The "Work Performed" section of the WR did not indicate that action was taken to identify and remove the ground.

The inspectors considered the failure to follow plant procedure requirements to (1) locate, isolate and remove the 125Vdc grounds, (2) enter an administrative LCO, and (3) issue a JCO when appropriate, to be an example of a violation of 10 CFR 50, Appendix B, Criterion V (237/92028-01(DRS); 249/92028-01(DRS)).

4.3 Fuse Control/Upgrade Program

In early 1992, the licensee initiated a Fuse Control/Upgrade Program following EDSFI findings, issuance of NRC Information Notice 91-51 and an INPO initiative to properly size and classify all installed fuses. As of December 1992, the licensee completed walkdowns of approximately 65% of the known safety related fuses. The licensee established a fuse list, issued a fuse control procedure and documented various fuse discrepancies in Technical Problem Reports (TPRs). The TPRs were then submitted to Sargent & Lundy (S&L) for evaluation and analysis to determine whether the fuses were correctly sized and coordinated and to provide proposed corrective action. NED then evaluated S&L's analyses prior to sending the TPRs to Dresden system engineers for field implementation.

The inspectors reviewed five of sixteen licensee Nuclear Engineering Department (NED) and S&L evaluations issued to resolve field identified fuse discrepancies. The inspectors reviewed the safety related fuse circuit discrepancies documented in TPRs DF-0143, 0147, 0149, 0184 and 0186, where the installed fuses did not correspond with vendor design and drawing requirements. The fuse discrepancies were identified in February and April 1992. The design analysis/evaluation which included vendor input was completed in June 1992 when the licensee and Sargent & Lundy engineers concluded that, under a fault condition, the currently installed fuses would not provide adequate circuit protection or coordination and could result in damage to safety related components and circuits. The proposed corrective action was to replace the discrepant fuses with the correct size and type.

The following observations were made during the review of the TPRs:

- TPRs DF-0147 and DF-0186 documented that the currently installed fuses in the excitation and control circuits of EDGs 2 and 3 were 30A and 40A fuses rather than the vendor specified 25A fuses. The engineering evaluation stated that the currently installed fuses did not provide adequate circuit and component protection. Under a fault condition, these fuses could cause a loss of power to excitation and control circuits for the

standby diesel generators. The licensee's evaluation relied on the redundant EDG to provide power if a fault occurred on one EDG. The engineering evaluation recommended that the existing fuses be replaced with the 25A fuses specified by the vendor. The inspectors determined that a TPR was not issued for the oversized fuse in the Unit 2/3 EDG circuitry; neither were WRs issued to replace the oversized fuses on all three EDGs until questioned by the inspectors on December 12, 1992. In addition, a replacement schedule had not been established to replace the improperly sized fuses. The replacement fuses and fuse holders were not ordered until November 1992.

- TPR DF-0143 documented a discrepancy in the Unit 3 Uninterruptible Power Supply (UPS) circuitry, where an 800A fuse was installed instead of the required 500A fuse. The UPS provides 120Vac to the 1E ESS bus. The inspectors questioned the licensee whether Unit 2 was inspected to verify if the appropriate fuses were installed in similar UPS circuits. The inspector was informed that this was not accomplished yet, even though the Unit 3 fuse discrepancy was identified on February 14, 1992. The inspectors noted that Work Request (WR) D10349 was issued on June 30, 1992, to replace the Unit 3 fuse. However, as of this inspection, the WR has not been assigned a work priority, nor had it been processed for field implementation. On January 4, 1993, during a telephone conference requested by the licensee, the inspectors were informed that while attempting to replace the 800A fuse during a short outage on December 28, 1992, the licensee noted that the installed fuses were actually 500A rather than the 800A noted during the walkdown performed in February 1992. The licensee replaced the fuse with a like-for-like fuse. Incorrect identification of fuse sizes is considered to be a weakness in the licensee's fuse inspection program.

- TPR DF-0149 and DF-0184 documented that the installed fuses in the RWCU demineralizer solenoid and LPCI valve 1501-25A circuits were oversized and did not coordinate with the upstream circuit breakers. The licensee's evaluation recommended that these fuses be replaced. No documentation was available for review to indicate that corrective action was initiated.

The inspectors noted that since May 1992, the licensee had several opportunities to replace the oversized fuses on both units. However, the licensee had not developed a schedule to replace the incorrect fuses noted during the February through April 1992 walkdowns.

The licensee's failure to take corrective actions to replace improperly sized fuses used to protect safety related components and circuits is considered a violation of 10 CFR 50, Appendix B, Criteria XVI (237/92028-02(DRS); 249/92028-02(DRS)).

The inspectors performed field inspections of selected fuses installed in safety related panels. Most of the fuse types and sizes could not be verified without removing the fuses because original labeling information was not present on the fuses. One oversized fuse was discovered during inspector walkdowns (FU16, a 5A fuse was installed rather than the 3A fuse shown on drawing 12E-6811AP, Revision 1). Additionally, porcelain fuse holders located in control room HVAC panel, and shown on wiring drawing 12E-6811AP, Revision 1, were stamped "withstand rated 10,000 Amps. rms"; however, some of the fuses installed in these holders were rated at 200,000 Amps. rms. The licensee was in the process of evaluating this finding. Pending licensee action and NRC review, this matter is considered to be an Open Item (237/92028-03(DRS); 249/92028-03(DRS)).

4.4 Walkdowns for Design Basis Program

The licensee's ongoing Design Basis Program was reviewed to determine the progress and direction taken by CECo to provide retrievable design basis information. Design bases for four systems were being finalized. The program was considered to be a positive management initiative.

4.5 Physical Separation Between Electrical Divisions

On November 26, 1991, the licensee discovered that the power feed cables to 480V MCCs 28-2, 28-3, 29-2, and 38-2 for Units 2 and 3 were misclassified as BOP feed cables and consequently not physically separated between electrical divisions (LER-91-042). This condition was contrary to the licensee's design criteria for divisional separation. The affected cables were promptly rerouted in safety related trays and identified with the correct segregation code. The licensee's ongoing Master Equipment List Upgrade Program and the Component Classification Program may identify if additional cable segregation inconsistencies exist. These programs are considered positive management initiatives. The NRC considers the licensee's failure to originally install and maintain these cables as safety related to be a violation 10 CFR 50, Appendix B, Criterion III, and of the licensee's separation criteria which states, "a safety-related cable shall be only routed within the raceway system of the division to which it is assigned", as well as Regulatory Guide 1.97 and IEEE 279 guidelines. However, the licensee identified this violation and it is not being cited

because the criteria specified in Section VII.B.(2) of the "General Statement of Policy and Procedures for NRC Enforcement Actions," (Enforcement Policy, 10 CFR Part 2, Appendix C (1992)), were satisfied.

4.6 Design Control/Modification Review

The inspectors evaluated the licensee's performance and programs relating to design changes and modifications. The inspectors reviewed two modification packages. Areas verified included review and approval process, post modification test requirements and execution, training, 10 CFR 50.59 reviews, and satisfactory completion of design requirements. The following modifications were reviewed:

(a) M12-2-91-022, High Pressure Coolant Injection (HPCI) Valve 2301-10 Interposing Relay Addition.

(b) M12-3-91-021, Addition of 4 Cells to Unit 2 250Vdc Battery.

The modification packages were comprehensive and detailed. The inspectors concluded the licensee was adequately implementing the design control process for these modifications.

5.0 Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during this inspection are discussed in Section 4.2 of this report.

6.0 Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on December 11, 1992. The inspectors summarized the scope and findings of the inspection activities. The licensee acknowledged the inspection findings. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such document/processes as proprietary. Subsequent to the initial exit, the inspector conducted an additional exit with the licensee by telephone on January 4, 1993, after the licensee uncovered additional information which affected one of the violations.