U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-237/85016(DRS)

Docket No. 50-237 License No. DPR-19

Licensee: Commonwealth Edison Company
P.O. Box 767
Chicago, IL 60690

Facility Name: Dresden Nuclear Power Station, Unit 2

Inspection At: Morris, IL

Inspection Conducted: April 11 through May 3, 1985

Inspector: P. R. Rescheske 6/6/85
Date

Approved By: M. A. Ring, Chief 6/6/85
Test Programs Section Date

Inspection Summary

Inspection on April 11 through May 3, 1985 (Report No. 50-237/85016(DRS))
Areas Inspected: Routine, unannounced safety inspection of surveillance of core power distribution limits; calibration of the local power range monitoring system; APRM (average power range monitor) calibration; core thermal power evaluation; determination of reactor shutdown margin; nuclear instrumentation response and reactivity checks; and control rod drive performance testing. The inspection involved a total of 81 inspector-hours onsite by one NRC inspector.
Results: Of the seven areas inspected, no items of noncompliance or deviations were identified in four areas; two items of noncompliance were identified in the remaining three areas (failure to follow procedures - Paragraphs 3 and 8.d.; failure to follow Q.A. procedures - Paragraphs 7.a, 7.b, and 8.d).

8506140515 850606
PDR ADOCK 05000237
Q PDR

DETAILS

1. Persons Contacted

*D. J. Scott, Station Manager
*J. D. Brunner, Assistant Superintendent - Technical Services
*M. C. Luoma, Station Quality Assurance Supervisor
*J. H. Paczolt Jr., Lead Nuclear Engineer
J. Achterberg, Technical Staff Supervisor
J. Almer, Unit 2 Operations Engineer
E. Kotrich, Special Projects Engineer
R. Stobert, Quality Assurance Engineer
P. Roth, Nuclear Engineer
*T. M. Tongue, NRC Senior Resident Inspector
*C. D. Anderson, NRC Resident Inspector

The inspector also interviewed other licensee employees including members of the quality assurance, technical, and operating staff.

*Denotes persons attending the exit meeting of May 3, 1985.

2. Surveillance of Core Power Distribution Limits

The inspector reviewed a number of the licensee's surveillances of thermal limits and core power distribution limits. Procedure DTS 8235, "Nuclear Engineer's Checklist," Revision 2, is used by the licensee to periodically check plant parameters and acquire data above 10% rated core thermal power. The inspector reviewed a sample of the checklists completed in April 1985 and verified that the data was properly recorded at the recommended frequency of about three times per week.

The licensee performs and documents daily surveillances using Appendix A (of DAP 7-2), "Unit 2(3) Operator's Daily Surveillance Log," Revision 16, which references a series of procedures (DOS 500) providing the methods to be used (usually above 25% rated power). The inspector reviewed the following surveillances for April 15 through 28, 1985, and verified that the results and the frequency of the testing satisfied technical specifications, and that the data was properly recorded and reviewed:

- DOS 500-6, Revision 7, "APRM Gain Adjustment," provides a check on Average Power Range Monitor (APRM) readings.

- DOS 500-12, Revision 3, "Unit 2(3) Operator's Surveillance of APRM Flow Biased Scram and Rod Block Settings (Mixed Core)," provides a check on APRM settings.

- DOS 500-13, Revision 2, "Unit 2(3) Operator's Surveillance of ECCS Limitations on Power Distribution (Mixed Core)," provides a check on Local and Average Planar Linear Heat Generation Rates (LHGR and APLHGR).

- DOS 500-14, Revision 2, "Unit 2(3) Operator's Surveillance of

Thermal-Hydraulic Limitations on the Core Power Distribution (Mixed Core)," provides a check on Minimum Critical Power Ratio (MCPR).

- DOS 500-17, Revision 0, "Operator's Daily Surveillance for Limiting Control Rod Pattern," checks if a Limiting Control Rod Pattern (LCRP) exists.

- DOS 500-18, Revision 7, "Operator's Flow Control Line and Average Core Thermal Power Surveillance," checks if Core Thermal Power (CTP) is $\leq$ 2527 MWt (over one shift) and checks the Flow Control Line (FCL) against its limit.

The inspector observed that procedures DOS 500-6 and DOS 500-12, and Appendix A referenced Technical Specification Sections 3.1.B and 4.1.B concerning the reactor protection system. Amendment 80 to the Technical Specifications, dated February 14, 1984, revised and renumbered Sections 3.1 and 4.1 such that part B no longer existed. The inspector noted that the above mentioned procedures were revised in 1985, and that this Technical Specification change was not incorporated into the revisions. The licensee noted this concern and agreed to correct the error in the procedures.

No violations or deviations were identified.

3. Calibration of the Local Power Range Monitoring System

The inspector reviewed the licensee's procedures for the calibration of the Local Power Range Monitor (LPRM) system and noted that, although not specified in technical specifications, a calibration is required by the Fuel Warranty Contract once every 1000 effective full power hours of operation. Procedure DTS 8236, "Whole Core LPRM Calibration (Mixed Core)," Revision 1, is the checklist used for the calibration and is performed in conjunction with DIP 700-16, "LPRM Amplifier Gain Calibrations," Revision 0, which provides the instructions for properly adjusting the LPRM amplifier gains. For a calibration performed on April 18, 1985, the inspector verified that the methodology was technically adequate and that the checklist was properly initialed. The inspector observed for LPRM adjustments performed on April 18 and May 1, 1985, that the LPRM Calibration Data computer printout (data sheets) had not been completed correctly. Procedure DIP 700-16, Step F.8, requires that the past current level listed on the computer printout be verified and recorded (checked off) on the printout. Technical Specification 6.2.A states in part that written procedures shall be prepared, approved, and adhered to concerning normal startup, surveillance, and testing activities. Contrary to this, the licensee failed to check off the past current level column on the printout. This is considered an example of an item of noncompliance (237/85016-01a(DRS)).

The inspector also reviewed Procedure DTS 8233, "TIP System Calibration," Revision 3, and the completed checklist for the Traversing In-Core Probe (TIP) calibration performed on April 18, 1985. The inspector noted that Steps F.7 and F.10 were not clearly stated and that the checklist used to

record the data was not properly formatted. The licensee agreed to revise the procedure so that a TIP calibration can be more adequately performed and documented. Step F.7 requires that a sample of both 'B' and 'C' level calibrated LPRM readings be recorded and used in the calculation to determine the desired 100% deflection current for each TIP amplifier. Contrary to this requirement and Technical Specification 6.2.A, the licensee recorded only one of the LPRM level readings and not both 'B' and 'C' levels as specified in the procedure. This is considered another example of an item of noncompliance (237/85016-01b(DRS)).

No additional violations or deviations were identified.

4. APRM (Average Power Range Monitor) Calibration

The inspector reviewed Procedure DTS 8139, "APRM Calibration," Revision 2, and verified that the results from a calibration performed on April 13, 1985, (at about 10% CTP) indicated that the APRM channels were adjusted to read equal to or greater than the actual percent of reactor rated power. The inspector observed that some of the required calibration data was recorded in the margins on the data sheet, apparently due to the inadequate format of the data sheet. The licensee noted the inspector's concern and agreed to revise the data sheet so that the data can be more clearly and properly documented. Procedure DIS 700-17, "APRM Gain Adjustment," Revision 4, provides the instructions for adjusting the Average Power Range Monitor gain factors. The inspector reviewed a sample of results from 10% to 95% CTP between April 13 and May 1, 1985, and verified that the Average Gain Adjustment Factors (AGAFs) were in the acceptable range of 0.980 to 1.010. The inspector also verified that all data was properly recorded, including the as-found and as-left AGAFs, and that the results were signed-off and reviewed.

No violations or deviations were identified.

5. Core Thermal Power Evaluation

The inspector reviewed Procedure DTS 8237, "Calculation of Core Thermal Power - Technical Staff Method," Revision 4, and related information such as computer printouts and daily surveillances of CTP. This procedure outlines four methods for performing a thermal heat balance and determining CTP. The inspector reviewed calculations performed on April 14, 17, and 23, 1985, and verified that the licensee's methodology and calculations were technically correct. The inspector noted that the completed calculations were apparently not being properly reviewed. Examples were found in which an incorrect and/or incomplete calculation was being signed-off as completed and reviewed; however, the inspector observed that all data necessary for the calculation was retrievable (e.g., a computer printout was attached to the calculation). The licensee noted this concern and assured the inspector that proper independent review would be implemented. The inspector has no further concerns regarding this item.

No violations or deviations were identified.

6. Determination of Reactor Shutdown Margin

The inspector reviewed Procedure DTS 8134, "Units 2/3 Shutdown Margin Demonstration," Revision 8, used by the licensee to satisfy Technical Specification 4.3.A.1 surveillance requirement subsequent to the cycle 10 core load. The licensee used both the in-sequence critical method and the 2-rod diagonally adjacent subcritical method to demonstrate that the minimum margin of 0.25% $\frac{\Delta k}{k}$ + R could be met (note that R = 0.02% $\frac{\Delta k}{k}$, as provided by the fuel vendor). The inspector verified that the licensee's methodology and calculations were technically correct and in accordance with technical specifications, and that the results indicated that an adequate shutdown margin could be maintained throughout the current operating cycle. The inspector also verified that the data was properly recorded, including data supplied by the fuel vendor (Exxon), and that the results and calculations were reviewed by the appropriate personnel.

No violations or deviations were identified.

7. Nuclear Instrumentation Response and Reactivity Checks

The inspector reviewed the licensee's procedures and test results concerning Nuclear Instrumentation (NI) response and reactivity checks. The following observations were made during this review:

a. Procedure DTS 8138, "IRM Performance," Revision 1, is used by the licensee during startup to verify that the Intermediate Range Monitors (IRMs) can detect neutron flux and to verify IRM overlap. The inspector reviewed the data obtained between April 10 and 13, 1985, and observed that the format of the data sheet was apparently inadequate in that data and subsequent corrections to the data could not be clearly recorded in the spaces provided. The licensee agreed to revise the data sheet so that the data can be clearly and legibly recorded. 10 CFR 50, Appendix B, Criterion II, as implemented by the CECo Quality Assurance Manual, states in part that the quality assurance program shall be documented by written procedures and shall be carried out in accordance with those procedures. Quality Procedure Q.P. No. 17-51, "Quality Assurance Records for Operations - Control of Station Records," states that the acceptable method for making changes to records is to line-out the information, initial, date it, and then make the correction. This quality procedure specifically prohibits modifying documents with the use of white-out, correction tape, scribbling out information, and marking over data. Contrary to this, the inspector identified a number of scribbled out and marked over data on the IRM performance data sheets. This is considered an example of an item of noncompliance (237/85016-02a(DRS)).

b. Procedure DTS 8135, "SRM Performance," Revision 2, is used by the licensee during startup to verify SRM operability and to verify overlap into the intermediate flux range. The inspector reviewed the data obtained on April 10, 1985, and contrary to the Q.P. No. 17-51 requirement above, a number of examples were identified in

which data had been scribbled out and marked over (not legible). This is considered another example of an item of noncompliance (237/85016-02b(DRS)).

c. Procedure DTS 8154, "Control Rod Following and LPRM Operability Verification," Revision 2, is used by the licensee during startup to verify that the LPRM detectors are operable and to verify that each control rod blade is following its drive by observing the NI response. The inspector reviewed the results obtained during the Cycle 10 startup in April 1985, and verified that the licensee's methodology was adequate and that the data was properly recorded and reviewed.

d. Procedure DTS 8141, "U-2(3) Initial Criticality Comparison," Revision 3, is used by the licensee during startup to perform an eigenvalue comparison by comparing the calculated critical control rod pattern to the actual critical control rod pattern. The inspector reviewed the results from the April 10, 1985, calculation and verified that the methodology was adequate, that the licensee had accounted for period and moderator temperature coefficient corrections, and that the data was properly recorded, including data supplied by the fuel vendor. The inspector noted that the resultant anomaly of 0.07% $\frac{\Delta k}{k}$ satisfied the Technical Specification 3.3.E limit of 1.0% $\frac{\Delta k}{k}$.

e. Procedure DTS 8137, "Moderator Temperature Coefficient of Reactivity," Revision 1, is used by the licensee during startup to describe a method of acquiring data and evaluating temperature dependence. The inspector reviewed data obtained on April 10, 1985, and verified that the procedure was performed and data recorded for at least three reference temperatures as specified. The inspector observed that the procedure did not require signatures of the test personnel or review of the data. The licensee noted this concern and agreed to revise the data sheet to include a signature block for the participants performing the test.

No additional violations or deviations were identified.

8. Control Rod Drive Performance Testing

The inspector reviewed the licensee's procedures and test results for startup testing of the control rod drives. The following observations were made during this review:

a. Procedure DTS 300-2, "Control Rod Drive Scram Testing and Scram Valve Timing Test," Revision 9, is used by the licensee to satisfy Technical Specification 3.3.C, 4.3.C, and 3.5.K surveillance requirements and scram valve timing requirements. The inspector witnessed portions of the test and reviewed the results from the testing performed on April 15 and 16, 1985, and verified that the data was recorded correctly, that the checklists were properly reviewed and documented, and that all technical specification

requirements were met. The inspector observed the "Limitations and Actions" section of the procedure did not include a reference to the Technical Specification 3.3.C requirement, which states the limits on the average scram insertion times as a function of the percent that the rod is inserted. The licensee's administrative procedures discuss the content of a "Limitations and Actions" section and state, in part, that this section should include the limitations on the parameters being controlled. Other licensee commitments require that written acceptance criteria be included in a procedure. The licensee noted the inspector's concern and agreed to revise the "Limitations and Actions" section to include a statement referencing the Technical Specification 3.3.C requirement.

b. Procedure DTS 300-6, "Control Rod Drive Friction Testing," Revision 5, is used by the licensee to provide the instructions to friction test the Control Rod Drives (CRDs). The inspector reviewed the results from testing performed subsequent to Cycle 10 core load and verified that the data was properly recorded and that the sign-off checklists were completed. The inspector noted that there was extensive use of pencil entries for recording and verifying data. Although this is considered a poor documentation practice, there is no written requirement prohibiting the use of pencil on quality records.

c. Procedure DTS 300-10, "Control Rod Drive Functional Scram Testing," Revision 1, is used by the licensee to functionally test the CRDs prior to reactor startup to verify their operability. The inspector reviewed the test and verified that the checklists were properly signed-off and reviewed.

d. Procedure DOS 300-4, "Control Rod Drive Timing," Revision 4, is used by the licensee to verify proper CRD withdraw and insertion times. The inspector reviewed data from the testing performed on April 3 through April 8, 1985, to verify that the applicable checklists were completed correctly and that the results indicated that the test requirements were satisfied. Part C.4 of this procedure requires that the drive time shall be adjusted to 48 seconds ±10.0% and then retimed. Drive timing is performed by the process computer which will print out the time accurate to the nearest 0.01 second (if the computer is not available, a stopwatch is used). Technical Specification 6.2.A states in part that written procedures shall be prepared, approved, and adhered to concerning normal startup, surveillance, and testing activities. Contrary to this, on April 5, 1985, the licensee failed to adjust and retime the drive at location G-11 (26-43) which had a total insertion time of 43.15 seconds. This is considered an example of an item of noncompliance (237/85016-01c(DRS)).

In addition, the inspector noted that corrections to the records were not being properly made. 10 CFR-50, Appendix B, Criterion II as implemented by the CECo Quality Assurance Manual, states in part that the quality assurance program shall be documented by written

procedures and shall be carried out in accordance with those procedures. Quality Procedure Q.P. No. 17-51, "Quality Assurance Records for Operations - Control of Station Records," states that the acceptable method for making changes to records is to line-out the information, initial, date it, and then make the correction. This quality procedure specifically prohibits modifying documents with the use of white-out, correction tape, scribbling out information, and marking over data. Contrary to this, the inspector identified a number of scribbled out and marked over data. Furthermore, for CRD D-4 (14-15), steps 160A and 160B, on April 6, 1985, correction tape was used to change the withdraw and insertion times, the drive water pressure, and the stall flows. This is considered an example of an item of noncompliance (237/85016-02c(DRS)).

No additional violations or deviations were identified.

9. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) on May 3, 1985. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspector with respect to the items of noncompliance. The inspector 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 documents/processes as proprietary.