U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-456/94007(DRP); 50-457/94007(DRP)

Docket Nos. 50-456; 50-457 License Nos. NPF-72; NPF-77

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

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braceville, Illinois

Inspection Conducted: February 23 through April 1, 1994

Inspectors: S. G. DuPont
E. R. Duncan
R. B. Landsman
D. Schrum

Approved By: B. L. Jorgensen, Chief
Reactor Projects Section 1A

4-19-94
Date

Inspection Summary

Inspection from February 23 through April 1, 1994 (Report Nos. 50-456/94007(DRP); 50-457/94007(DRP))
Areas Inspected: Routine, unannounced safety inspection by resident and regional office inspectors of operational safety, maintenance, surveillance, licensee action on previously identified findings, feedback of operational experience information at operating power reactors, design changes and modification programs, and licensee reports.
Summary: One cited violation was identified (Level IV - one example of failure to follow procedure) in one area and another non-cited violation (Level V - test equipment used when outside calibration period) was identified in another area.

DETAILS

1. Management Summary

The inspectors met with the licensee representatives denoted in Paragraph 12 during the inspection period and at the conclusion of the inspection on April 5, 1994. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature. The following were highlights of the inspection:

Operations: One personnel error occurred just following the inspection period which resulted in the inadvertent discharge of a gas decay tank. This is an Unresolved Item (50-456/94007-01(DRP); 50-457/94007-01(DRP)) pending further NRC review (Paragraph 2).

The licensee's response to the Main Steam Safety Valve setpoint and the Furmanite Trevitest issues were conservative and appropriate (Paragraph 2).

Maintenance: Maintenance was excellent overall during the inspection period. There were numerous examples of maintenance being performed in a deliberate and well-organized manner. An exception to this was a diesel generator temperature element replacement (Paragraph 3).

Plant Support: One violation for failure to follow procedure was identified in the fire protection area relating to the control of transient combustibles (50-456/94007-02(DRP); 50-457/94007-02(DRP)) (Paragraph 2).

2. Operational Safety Verification (IP 71707)

The inspectors verified that the facility was being operated in conformance with the licenses and regulatory requirements and that the licensee's management control system was effectively carrying out its responsibilities for safe operation. The following activities were considered in detail:

- April 7, 1994, inadvertent release of the "C" gas decay tank.
- Poor control of transient combustibles.
- Review of deficiency on main steam safety valve setpoint.
- Inoperable control room ventilation system.
- Main steam safety valve inoperability due to calculational error.
- April 5 Unit 2 trip and stuck rod event.

On April 7, 1994, operators inadvertently released the "C" Gas Decay Tank (GDT). This occurred when operators commenced a release of the "F" GDT and discovered unexpected pressure changes in the system. The operators immediately terminated the release. Upon further investigation, the licensee determined that the "C" GDT discharge isolation valve was open. Additionally, the valve was not verified closed after the "C" GDT was lined up as a source of cover gas earlier in the day. This resulted in an unplanned release. The release was verified to be within the technical specification allowed limits. This is an Unresolved Item (50-456/94007-01(DRP); 50-457/94007-01(DRP)) pending further NRC review.

The control of transient combustibles was poor. During this inspection, there were numerous examples of uncontrolled and unattended combustibles in the plant. During the initial phase of the Unit 1 refueling outage, combustibles were staged within the plant without being calculated into the fire load and tagged as transient combustibles. These materials included lumber, staging, stairs for trailers, porta-potties, timber, and station battery cells.

The fire marshal was in the process of attempting to assign the location of materials on the turbine deck and to include them into the transient combustible program. However, this process was untimely in that some of the materials were uncontrolled for more than a month. Additionally, the fire marshall was not immediately responsive to the issue of uncontrolled combustibles. The fire marshall did not demonstrate a posture of challenging the need for the quantity of combustibles brought into the plant. Monitoring of these combustibles was also untimely, in that fire watches were not assigned to identify combustibles until after a large quantity was staged. This resulted in large quantities of combustibles being staged without appropriate consideration for protecting safety-related systems, components, or structures.

Technical Specification 6.8.1 requires that written procedures shall be established, implemented, and maintained covering activities referenced in Appendix A, Regulatory Guide 1.33, Revision 2, February 1978, which includes the fire protection program.

Braidwood Administrative Procedure 1100-11, "Fire Prevention for use of Lumber and Other Combustibles", Revision 2, requires combustibles transported into plant areas which will be left unattended shall have prior authorization by the Station Fire Marshal/designee by completing a Transient Fire Load Permit. After reviewing the loading to be added to each indicated fire zone, the Fire Marshal/designee shall approve the permit and issue a Permit Number with the required number of Approved Transient Fire Load Tags.

Numerous examples of combustible materials were left unattended in the auxiliary and turbine buildings without obtaining a transient combustible authorization or the required fire loading review. This is an example of a violation (50-456/94007-02(DRP); 50-457/94007-02(DRP)).

The licensee responded to the combustible material control issue by enforcing the use of their procedure. These actions proved effective, as combustible materials were verified by the inspector to be controlled per the procedure.

The resident inspectors reviewed the licensee's response to a deficiency in the design basis for the Main Steam Safety Valve setpoint. These setpoints are contained in the Westinghouse Standard Technical Specifications (TS) Table 3.7-1, "Operable Main Steam Safety Valves Versus Applicable Power in Percent of Rated Power."

On January 20, 1994, Westinghouse issued Nuclear Safety Advisory Letter (NSAL) 94-01, "Operation at Reduced Power Levels with Inoperable MSSVs." This letter stated that plant operation at power levels determined in accordance with the requirements of TS Table 3.7-1 may not be conservative. The safety significance of this issue is that overpressurization could cause main steam system pressure to increase beyond 110 percent, exceeding the design basis.

In response to this letter, the licensee lowered the maximum allowable power range neutron flux high setpoints in accordance with the new Westinghouse information.

On February 18, 1994, the control room ventilation system was declared inoperable. On February 17, the site was notified that the South Texas Plant had recently experienced problems with the backup batteries for the actuators in their Control Room Ventilation (VC) system. An investigation was immediately begun to see if a similar situation existed at Braidwood. System Engineering determined that the actuators were only in the Main VC system.

On the morning of February 18, 1994, System Engineering collected battery voltages to determine operability of the VC system. Four batteries were found inoperable on B train. Subsequent data was collected which showed that all the batteries on A train were also below the required voltage. The station declared both trains of VC inoperable. Technical Specification (TS) 3.0.3 was entered and the station requested and received discretionary enforcement. The station exited TS 3.0.3 on February 20, after returning one train of VC to operable conditions.

The detailed review of the circumstances leading to the battery failures and the licensee's corrective actions is contained in a special Inspection Report (50-456/94008(DRP); 50-457/94008(DRP)).

During main steam safety valve testing at Palo Verde in August 1993, a discrepancy was noted between Westinghouse over-pressure test results and those of Furmanite's Trevitest results. Subsequent comparative testing indicated that an offset existed between the two test methods; however, the results seemed to correlate.

The offset was attributed to the calculation methodology used by Furmanite in determining the valve mean seat area (MSA). The MSA was calculated by averaging the inside and outside dimensions of the nozzle to determine the mean seat diameter. This calculation did not take into account the actual valve dynamics which result in a smaller effective valve seat contact area. This resulted in about a 7 percent calculated error in the MSA and a nonconservative difference in setpoint of about 1.2 percent. As a result of the comparison testing, Furmanite issued a letter dated March 10, 1994, informing licensees of the discrepancy and the possible offset condition.

When the licensee received this information, it was immediately evaluated. The licensee determined that Braidwood Station Unit 2 was not in compliance with TS 3.7.1.1 due to inoperable Main Steam Safety Valves (MSSVs). Braidwood Unit 1 was unaffected since it was in a refueling outage.

On March 10, 1994, the licensee requested an enforcement discretion (NOED) of TS 3.7.1.1. This request was submitted formally by letter on March 11, 1994.

As justification for continued operation, the licensee provided a previous analysis of as-found MSSV setpoint deviations bounding an upcoming amendment request. In addition, the analysis indicated that the current accident analysis, as presented in the Updated Final Safety Analysis Report, remained valid.

The NRC's review of the licensee's justification concluded that this exercise of discretion involved minimal or no safety impact, and that this course of action was clearly warranted from a safety perspective. On March 10, 1994, the NRC issued the NOED not to enforce TS 3.7.1.1 for the period from March 10, 1994, until the approval of the licensee's emergency TS amendment request. The amendment requested a one-time exemption from TS 3.7.1.1 until the MSSVs were reset.

On April 5, 1994, at 3:39 p.m., Unit 2 tripped from 100 percent power due to a fault on the 2E Main Power Transformer. During the trip, all systems responded as expected, with the exception of control rod K-2 in control bank B, which failed to insert past the 210 position. Because of the unique nature of the event, the NRC dispatched an Augmented Inspection Team (AIT) on April 11, to review the licensee's testing and recovery process, and to gather technical data regarding this event. The AIT's findings and conclusions are the subject of special Inspection Report 50-456/94013(DRS); 50-457/94013(DRS).

One violation and one unresolved item were identified.

3. Monthly Maintenance Observation (IP 62703)

Routinely, station maintenance activities were observed and/or reviewed by the inspectors to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or

standards, and in conformance with technical specifications. The following maintenance activity was observed and reviewed:

- 1B Diesel Generator Lube Oil Temperature Element Replacement

On March 12, 1994, the inspector observed the replacement of two lubrication oil temperature elements on the 1B Diesel Generator. This activity was part of the 10 year tear down inspection. During the maintenance task, the inspector noticed that the new elements being installed were not identical to the elements that had been removed, even though the work package instructed maintenance personnel to verify like-for-like replacement. When brought to the attention of personnel performing the job, the supervisor was immediately informed and the job was stopped. Upon further investigation, the licensee discovered that the element received from the vendor was a new model and that although the element was slightly different dimensionally, it was acceptable for use in the intended application.

No violations or deviations were identified.

4. Monthly Surveillance Observation (IP 61726)

The inspectors observed selected surveillance testing required by technical specifications during the inspection period and verified that testing was performed in accordance with adequate procedures. The following surveillance activities were observed and reviewed:

- Source Range Discriminator Plateau Determination and Calibration for Channel N32

- Fire Protection Sprinkler System Quarterly Surveillance

- 1B Diesel Generator Monthly Surveillance

On March 4, 1994, the inspectors observed BwVS 3.1.1-3.2, "Source Range Discriminator Plateau Determination and Calibration for Channel N32," as part of the licensee's shutdown for refueling. During the surveillance, the inspector noted that a fluke meter (not being used for the surveillance being observed) had an expired calibration sticker. The inspector identified this finding to the licensee who determined that the meter had been used to perform BwIS 3.1.1-220, "Channel Verification/ Calibration of Nuclear Intermediate Range N35 & N36," during the shutdown. The individual performing the surveillance had mis-read the calibration sticker. The licensee subsequently sent the meter off to a calibration facility where it was determined that the meter was within calibration. 10 CFR 50, Appendix B, Criterion XII, requires that measures be established to assure that testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy. The

licensee's use of a fluke meter outside its calibration period is a violation. However, this violation is not being cited because the criteria specified in Section VII.B of the Enforcement Policy were satisfied.

One non-cited violation was identified.

5. Feedback of Operational Experience Information at Operating Power Reactors (IP 90700)

The inspector reviewed the licensee's response to Information Notice 89-77, Supplement 1, "Debris in Containment Emergency Sumps and Incorrect Screen Configuration," and verified that the licensee's program to inspect containment emergency sumps was thorough and comprehensive.

The licensee's response noted that an inspection of containment recirculation sumps is conducted every 18 months in accordance with surveillance procedure BwVS 5.2.D.2-1, "Visual Surveillance of Containment Recirculation Sumps," to ensure that each sump is inspected for evidence of loss of structural integrity, abnormal corrosion, missing parts, and evidence of debris obstructing the suction inlet piping.

The inspector reviewed the licensee's surveillance procedure and verified the surveillance specifically directed a visual verification that there is no debris obstructing the containment sump suction piping.

A review of the licensee's most recent completion of BwVS 5.2.D.2-1 for both units was performed to verify that these surveillances had passed successfully.

Finally, an independent inspection of accessible portions of the Unit 1 containment recirculation sump was completed to confirm the licensee's surveillance results.

No violations or deviations were identified.

6. Licensee Action on Previously Identified Items (IP 92701, IP 92702)

Inspection Followup Items

(Closed) 456/93022-02(DRS); 457/93022-02(DRS): Essential Service Water System (ESW) Used for Fire Protection. This followup item concerned the use of ESW when the diesel and electric fire pumps are inoperable. The inspector verified that calculations had been made for the ESW system to ensure that an adequate flow of water existed for sprinklers and fire hoses and that fire brigade training included fire fighting for an un-isolated electrical fire.

The licensee's investigation of the ESW systems to resolve NRC concerns for its use for fire protection was thorough. The investigation identified numerous additional potential problems that resulted in

revisions to the procedure. One of these items addressed an inspector concern which was to provide documentation for operations personnel to isolate the electrical transformer deluge systems to prevent inadvertent actuations of those systems. This followup item is considered closed.

No violations or deviations were identified.

7. Design Changes and Modifications Program (IP 37702)

Seismic Review of New Station Class 1E 125 Volt Battery Racks

Documentation from the battery vendor was reviewed, which included applicable seismic qualification test results from the Surry Plant, dated December 7, 1990. From the review it was verified that the two site horizontal response spectra are enveloped by the testing spectra. However, the site vertical response spectra was not enveloped by the testing spectra between the frequencies of 6 and 12 hertz. Additional testing was performed which showed that the minimum vertical frequency of the battery rack system was 22 hertz. Based on this, it was concluded that the rack system would not experience any dynamic vertical amplification between the 6 and 12 hertz range. The results were deemed acceptable to structurally qualify the battery racks. The installation was also inspected and found to be acceptable.

No violations or deviations were identified.

8. Licensee Event Report (LER) Review (IP 92700)

LERs were reviewed and closed based on the following criteria:

- Reportability requirements were met.
- Immediate corrective actions were accomplished.
- Corrective actions to prevent recurrence have been or will be initiated per technical specifications.

(Closed) 57/94001: Valves not included in Primary Containment Verification Surveillance due to Preservice Design Deficiency.

On January 31, 1994, while in Mode 1 at 73 percent power, the Unit 2 monthly surveillance, 2BwOS 6.1.1.a-1, "Primary Containment Integrity Verification of Isolation Devices Outside Containment," was being performed. The equipment attendant assigned to complete the field verifications had recently performed the Unit 1 version of the same procedure and noted that several valves were different between the two surveillances and questioned the validity of the differences.

The initial investigation by shift personnel revealed that three valves (2SI059A, 2SI059B, and 2RH8733A) were all missing from the surveillance. These valves are not explicitly listed in the technical specifications, but are among those required to ensure containment integrity. As immediate corrective actions, the valves were verified closed. In addition, procedure revisions were implemented and partial surveillances

were performed to check these valves. The root cause of this event is Preservice Design Deficiency. The primary problem was initiated when the original surveillance did not include these valves.

No violations or deviations were identified.

9. Report Review

During the inspection period, the inspector reviewed the licensee's Monthly Performance Reports for January and February 1994. The inspector confirmed that the information provided met the requirements of Technical Specification 6.9.1.8 and Regulatory Guide 1.16.

No violations or deviations were identified.

10. Violations for Which A "Notice of Violation" Will Not Be Issued

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensee's initiatives for self-identification and correction of problems, the NRC will not generally issue a Notice of Violation for a violation that meets the tests of 10 CFR 2, Appendix C, Section V.A. These tests are: 1) the violation was identified by the licensee; 2) the violation would be categorized as Severity Level IV or V; 3) the violation will be corrected, including measures to prevent recurrence, within a reasonable time period; and 4) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation. A violation of regulatory requirements identified during this inspection for which a Notice of Violation will not be issued is discussed in Paragraph 4.

11. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 3.

12. Persons Contacted

K. Kaup, Vice President
*A. Haeger, Executive Assistant
*K. L. Kofron, Station Manager
R. Stols, Support Services Director
*K. Bartes, Regulatory Assurance Supervisor
R. Kerr, Engineering and Construction Manager
*D. E. Cooper, Operations Manager
G. E. Groth, Maintenance Superintendent
R. Byers, Work Control Superintendent
D. Miller, Technical Services Superintendent
A. D'Antonio, Quality Verification Superintendent

*D. Skoza, Engineering Supervisor
S. Roth, Security Supervisor
*G. E. Kinsella, Fire Marshall
*A. R. Checca, System Engineering Supervisor
*J. Gosnell, System Engineer
*S. Butler, QV Inspector
J. Lewand, Regulatory Assurance

*Denotes those attending the exit interview conducted on April 5, 1994.

The inspectors also interviewed several other licensee employees.