U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/92007(DRP); 50-457/92007(DRP)

Docket Nos. 50-456; 50-457 Licenses No. 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 Braidwood, Illinois

Inspection Conducted: March 13 through April 20, 1992

Inspectors: S. G. Du Pont
D. J. Hartland

Approved By: M. Farber, Chief
Reactor Projects Section 1A

5/8/92
Date

Inspection Summary

Inspection from March 13 through April 20, 1992 (Reports No. 50-456/92007(DRP); 50-457/92007(DRP))
Areas Inspected: Routine, unannounced safety inspection by the resident inspectors of licensee action on previously identified items; licensee event report review; operational safety verification; monthly maintenance/surveillance observation; report review; and Commissioner visit.
Results: No violations were identified in five of the six areas inspected. In the remaining area, one violation was identified.

- During this inspection period, several personnel errors were assessed as a violation of regulations. Of the three examples cited, two occurred during the previous inspection period and the assessment was completed during this inspection. The details of the violation are discussed in Paragraph 5.

- A non-cited violation pertaining to the failure to recognize an instrument drifting above the licensee's limit for deviations between channels is discussed in Paragraph 4.

- A non-cited violation pertaining to the installation of a jumper on the wrong PORV circuitry during maintenance is discussed in Paragraph 5.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

K. L. Kofron, Station Manager
G. R. Masters, Project Manager
G. E. Groth, Production Superintendent
D. E. O'Brien, Technical Superintendent
D. E. Cooper, Assistant Superintendent - Operations
R. J. Legner, Services Director
A. D. Antonio, Nuclear Quality Program Superintendent
R. Byers, Assistant Superintendent Work Planning
G. Vanderheyden, Technical Staff Supervisor
S. Roth, Security Administrator
K. G. Bartes, Nuclear Safety Supervisor
A. Haeger, Regulatory Assurance Supervisor
*K. G. Bartes, Onsite Nuclear Safety Administrator
*P. L. Maher, Assistant Technical Staff Supervisor
*L. Guthrie, Assistant Superintendent Maintenance
*J. M. Lewand, Regulatory Assurance
*P. Zolan, Regulatory Assurance
*R. Flessner, Station Partner
*J. E. Nalewajka, Assistant Operating Engineer
*C. R. Chovan, Master Mechanic
*L. Alexander, Lead Chemist

*Denotes those attending the exit interview conducted on April 22, 1992.

The inspectors also talked with and interviewed several other licensee employees.

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

a. Open Item

(Closed) 457/91026-02(DRP): A Containment Spray Pump was inadvertently taken out-of-service. This item is closed. Corrective action will be tracked by the violation discussed in Paragraph 5 of this report.

b. Unresolved Items

(Closed) 457/92004-02(DRP): Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.3 was inadvertently entered after both hydrogen recombiner systems were rendered inoperable. This item is closed based on the identification of a violation discussed in Paragraph 5 of this report.

(Closed) 456/92004-03(DRP): Safety Injection (SI) Accumulator was rendered inoperable when the boron concentration was found outside

the limits of TS requirements. This item is closed based on the identification of a violation discussed in Paragraph 5 of this report.

No violations or deviations were identified.

3. Licensee Event Report (LER) Review (92700)

Through review of records, the following LERs were reviewed to determine that reportability requirements were fulfilled, that immediate corrective action was accomplished, and that corrective action to prevent recurrence had been or would be accomplished in accordance with technical specifications:

(Closed) 457/92001
(Closed) 456/92002
(Closed) 457/92002
(Closed) 456/92003
(Closed) 456/92004

Corrective actions to LERs 456/92002, 457/92002, and 456/92003 will be tracked by the violation identified in Paragraph 5 of this report. Corrective actions associated with LER 456/92004 will be addressed with closure of the Open Item discussed in Paragraph 5 of this report.

No violations or deviations were identified.

4. Operational Safety Verification (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.

On a sampling basis the inspectors verified proper control room staffing and coordination of plant activities; verified operator adherence with procedures and TSs; monitored control room indications for abnormalities; verified that electrical power was available; and observed the frequency of plant and control room visits by station managers.

During tours of accessible areas of the plant, the inspectors made note of general plant and equipment conditions, including control of activities in progress. The specific areas observed were:

- Engineered Safety Features (ESF) Systems

  Accessible portions of ESF systems and their support systems components were inspected to verify operability through observation of instrumentation and proper valve and electrical power alignment. The inspectors also visually inspected

components for material conditions. The general housekeeping and material conditions of the plant continued to improve during this inspection period.

- Radiation Protection Controls

  The inspectors verified that workers were following health physics procedures and randomly examined radiation protection instrumentation for operability and calibration. No problems were identified during this inspection period.

- Security

  During the inspection period, the inspectors monitored the licensee's security program to ensure that observed actions were being implemented in accordance with the approved security plan. No problems were identified during this inspection period.

- Housekeeping and Plant Cleanliness

  The inspectors monitored the status of housekeeping and plant cleanliness for fire protection and protection of safety-related equipment from intrusion of foreign matter. General housekeeping improved and was considered to be good during this inspection period.

- Actions Associated With Events

  On April 3, 1992, the resident inspector discovered, during a routine control room panel walkdown, that pressurizer pressure channel 458 (1PI-458) was reading approximately 65 psig above normal operating pressure. The licensee had previously taken power range nuclear instrumentation channel N41 out-of-service earlier that morning for maintenance. Both the N-41 power range nuclear instrument and pressurizer pressure channel 458 provide input to two different Over Temperature Delta-Temperature (OTDT) protective circuits. The licensee immediately entered TS LCO 3.0.3 after the Operations Department determined that the two OTDT channels were inoperable. About three hours later, the licensee exited TS LCO 3.0.3 after successfully completing the maintenance and calibration on channel N41. The licensee returned 1PI-458 to service the following day following replacement of the pressure transmitter.

  1PI-458 had been previously taken out-of-service for calibration when the channel was noted reading higher than the other pressurizer pressure. The inspectors reviewed the work package and noted that the channel was adjusted to 2245 psig at 4:40 p.m. on April 2, 1992, within the 3% (24 psig) administrative requirement between the operable channels as prescribed by the post-maintenance verification. When the channel was returned to

service at 6:50 p.m., the channel was reading 2251 psig and subsequently trending slowly upward, as indicated on the computer data point printout. On the following shift, between 11:00 p.m. on April 2, 1991 and 2:45 a.m. on April 3, 1992, the unit Nuclear Station Operator (NSO) recorded the 1PI-458 channel as reading 2[illegible] psig on the "Shiftly and Daily Surveillance Data Sheet." At that time, there was a 25 psig deviation between operable channels, greater than 3% of scale a). Administrative Procedure 1BwOS 0.1-1,2,3, "Shiftly and Daily Operating Surveillance," required that deviations between operable channels greater than 3% of scale, but less than 6% of scale, be referred to the Shift Control Room Engineer (SCRE) for further evaluation. The 3% value was a licensee imposed administrative limit, while a greater than 6% deviation represents a TS limit and would result in an inoperable channel. The results of the evaluation were required to be recorded in the comments section of the data sheet. The operating staff failed to recognize that the indicated deviations were greater than the administrative limit and did not perform the administratively required evaluation.

When the resident inspector identified the condition on April 3, 1992, the NSO had not yet performed the shiftly surveillance. However, when N41 was taken out-of-service earlier that day, some of the annunciators that would normally alert the NSO of a problem were already alarmed due to the bistables that were tripped for the out-of-service. In such a situation, increased NSO awareness of vital plant parameters should have been initiated to identify the condition. However, had the channel continued to trend higher, the annunciator for high pressurizer pressure would have eventually alarmed. The NSO was monitoring the strip recorder for the controlling channel, which maintained pressurizer pressure by operating the spray valves and heaters, instead of the channel gauges. With 1PI-458 indicating higher than the other pressure channel, input to the OTDT trip setpoint caused the setpoint to trend in the non-conservative direction. However, the 1PI-458 input to the OTDT trip was small compared to the other inputs (Tavg and axial flux differential) and would not have prevented the OTDT from tripping within the analyzed setting. Due to the minimal safety significance involved and that the occurrence was considered to be isolated, the inspectors have exercised discretion and identified this event as a non-cited violation per 10 CFR 2, Appendix C, Section V.A.

As corrective action, Operations Department management briefed operators on the proper performance of the shiftly surveillance.

The inspectors also monitored various records, such as tagouts, jumpers, shiftly logs and surveillances, daily orders, maintenance items, various chemistry and radiological sampling and analyses, third party review results, overtime records, Quality Assurance and/or Quality Control audit results and postings required per 10 CFR 19.11.

One non-cited violation was identified.

5. Monthly Maintenance/Surveillance Observation (62703, 61726)

Routinely, station maintenance activities were observed and/or reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with TS.

The following items were also considered during this review: approvals were obtained prior to initiating the work; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; and activities were accomplished by qualified personnel.

The following maintenance activities were observed and reviewed:

- SX Valve (1SX-147) repair.
- Control rod circuitry troubleshooting and repair.

The maintenance activity associated with the SX valve, 1SX-147, was considered to be an example of good coordination and work planning. Extensive pre-task briefings were effective in ensuring that the repair activities were completed without incident.

The inspectors observed several of the surveillance testing required by TS during the inspection period and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that results conformed with TS and procedure requirements and were reviewed, and that any deficiencies identified during the testing were properly resolved.

The following surveillance activities were observed and reviewed:

- SP 92-002, Unit 1 Engineered Safeguards Features Actuation System Instrumentation Slave Relay Test.

- 1BwOS SI-1A, Safety Injection System Surveillance.

The station has experienced three events since mid February. Two of these events (February 13 and March 9, 1992), reported in Inspection Report 50-456/92004(DRP); 50-457/92004(DRP), were due to personnel errors related to maintenance and surveillance activities. On February 13, 1992, the licensee entered TS LCO 3.0.3 for both units after it was determined that both of the station's hydrogen recombiner systems were in an inoperable status. The "A" recombiner had been taken out-of-service (OOS) earlier for preventative maintenance when maintenance personnel mistakenly started work on the "B" recombiner. The primary cause of the event, as identified by the licensee, was failure of personnel to follow procedures governing OOS verification and self-

checking. Contributing causes were inadequate pre-job briefings and unclear wording in the work package.

A second event involving personnel errors occurred on March 9, 1992. The event occurred after the volume of the 1A SI accumulator was increased by more than 70 gallons. In accordance with TS 4.5.1.1.b, the boron concentration of the accumulator was required to be verified to be between 1900 and 2100 parts per million (ppm) within six hours after the addition. A sample was obtained and analyzed to be 2117.6 ppm, which was above the TS limit. The Chemistry Laboratory Supervision (CLS) and the SCRE recorded the concentration value and signed the applicable sections of surveillance procedure 1BwOS SI-1a, "Safety Injection Systems," as satisfying the TS requirement. Later that day, the unit NSO discovered the condition and notified the SCRE, and TS LCO 3.5.1 was entered for the inoperable accumulator. The licensee exited the LCO after the concentration was determined to be within the TS limits.

The root cause was determined to be personnel error on the part of the CLS and the SCRE. The CLS was aware that the boron concentration was above the TS limit, but believed that signing the surveillance only verified the completion of the sample analysis within the six hour time clock and not that the TS was satisfied. The SCRE failed to recognize the out of specification sample results even though the required concentration range was adjacent to the place provided for documenting the results on the surveillance data sheets. The procedure used for sampling the accumulator also failed to require the notification of operations of the out of specification conditions.

The third event that involved personnel errors occurred on March 15, 1992. While electrically isolating steam dump valve 2MS0046 for planned maintenance, an NSO inadvertently pulled the wrong fuses, resulting in a feedwater isolation and reactor trip due to a low-low steam generator (SG) level. OOS cards #10 and #11 for the associated work request required that fuses FU-51 and FU-52 be removed from the control cabinet. Instead, the NSO mistakenly removed fuses FU-10 and FU-11. These fuses de-energized the water hammer prevention protection relays, which resulted in the feedwater isolation and subsequent reactor trip. The Auxiliary Feedwater pump auto started, as expected, due to the low-low SG level signal. All systems responded as designed. The cause of the event was personnel error.

The inspectors independently evaluated the above events and determined that the root cause was personnel error. Personnel failure to follow station procedures, the cause of each of the three events, is a violation (50-456/92007-01(DRP); 50-457/92007-01(DRP)).

On March 25, 1992, a containment isolation valve closure occurred during performance of Special Procedure (SP) 92-002, "Unit 1 Engineered Safeguards Features Actuation System Instrumentation Slave Relay Test." The purpose of SP 92-002 was to determine if electrical jumper could be installed during future testing to prevent closure of Chemical Volume Control System letdown isolation valve 1CV8152. The cycling of 1CV8152

during slave relay testing had been previously identified as causing thermal stress on the volume control tank spray nozzle.

Despite independent verification of the correct location of the jumper by an NSO, a technical staff system test engineer, and an electrical maintenance department electrician (EMD), a second EMD installed the jumper at the wrong location. This caused closure of valve 1WO006A, the containment chilled water isolation valve, an ESF actuation. Upon identification of the condition, the testing was stopped, the jumper removed, and the valve returned to its normal position.

The licensee determined the cause of the event to be the location of the terminal board labeling in relation to where the jumper was to be installed and the cramped work area conditions. The inspectors will track licensee corrective action as an Open Item (50-456/92007-02(DRP); 50-457/92007-02(DRP)).

On April 1, 1992, while performing maintenance on 1MS018B, the SG 1B Main Steam Power Operated Relief Valve (PORV), a mechanic discovered that a load resistor/jumper, which was supposed to be installed on the relay card for 1MS018B (the 1B PORV) two days earlier, was inadvertently placed on the card for 1MS018C, the 1C PORV. The jumper was installed to prevent the PORV from opening beyond the 50% of full flow position during maintenance. The error was discovered after an annunciator activated. The annunciator should have been bypassed by the jumper during the testing on the valve.

Safety significance of the personnel error was minimal. The isolation valve to the 1B PORV (1MS019B) was closed during maintenance on the valve. In addition, the jumper installed on the 1C PORV rendered it inoperable, unable to open to its full flow position. However, SG PORVs are not safety-related, as they are not credited for responding to a design basis accident. The licensee identified the condition and have taken the appropriate corrective actions; therefore, the event is considered to be a non-cited violation.

One violation and one non-cited violation were identified.

6. Report Review

During the inspection period, the inspector reviewed the licensee's Monthly Performance Report for February and March 1992. The inspector confirmed that the information provided met the requirements of TS 6.9.1.8 and Regulatory Guide 1.16.

The inspector also reviewed the licensee's Monthly Plant Status Report for February and March 1992.

No violations or deviations were identified.

7. NRC Commissioner Visit

On April 14, 1992, NRC Commissioner E. Gail de Planque, accompanied by Eileen McKenna of the Commissioner's staff, and A. Bert Davis, Regional Administrator, Region III, toured the site and attended a presentation by the licensee. The offsite simulator and training facility were also toured.

8. 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. In addition, for isolated Severity Level V violations, a notice of violation will normally not be issued regardless of who identifies the violation provided the licensee has initiated appropriate corrective action before the inspection ends. Violations of regulatory requirements identified during this inspection for which a Notice of Violation will not be issued are discussed in Paragraphs 4 and 5.

9. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed by the inspector and which involve some action on the part of the NRC or licensee or both. An Open item disclosed during the inspection is discussed in Paragraph 5.

10. Exit Interview (30703)

The inspectors met with the licensee representatives denoted in Paragraph 1 during the inspection period and at the conclusion of the inspection on April 22, 1992. 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.