

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/92004(DRP); 50-457/92004(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: January 18 through March 12, 1992

Inspectors: S. G. Du Pont
R. A. Kopriva
D. J. Hartland

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


Date 3/21/92

Inspection Summary

Inspection from January 18 through March 12, 1992 (Reports No. 50-456/92004(DRP); 50-457/92004(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 observation; monthly surveillance observation; safety assessment and quality verification; and report review.

Results: One violation was identified in the area of operational safety verification. In the remaining areas, no violations were identified.

- During this inspection period, several apparent personnel errors occurred. Two unresolved inspection items (discussed in Paragraphs 4 and 6) address two significant errors. One involved an apparent personnel error by maintenance personnel resulting in placing both units in Technical Specification 3.0.3 due to both the OA and OB Hydrogen Recombiners being simultaneously inoperable. The other involved both the Chemistry Department Supervisor and Shift Control Room Engineer failing to document that the 1A Safety Injection Accumulator Boron concentration was outside the technical specification required limits. The inspection of both of these events is currently in progress and the results will be documented in a subsequent inspection report. Both the licensee and inspectors have identified these apparent personnel errors

as being significant. The licensee's corporate management is addressing the recent increase of personnel errors.

- A violation was identified pertaining to the failure of the Operations Department to document a valve in an abnormal position. This resulted in unexpected difficulties in charging the safety injection accumulators with nitrogen on January 28, 1992 (Paragraph 4).
- Control room demeanor continues to improve with noticeable enhancements to the pre-shift briefings by the Operations Department (paragraph 4).
- Positive control of switchyard activities was implemented during the inspection period to address potential shutdown risk. These actions are considered to be proactive (Paragraph 4).
- Enhancements in the licensee's problem identification and root cause determination process were noted during the inspection period (Paragraph 4).
- A review of the operating history of Units 1 and 2 revealed that the operating staff's performance during several large load changes was good without any noted difficulties (Paragraph 4).
- On February 25, 1992, Unit 2 received a reactor trip during surveillance activities due to a failed circuit card on the digital electrohydraulic control system. During the trip, several secondary plant components failed to respond as expected. The major component failure was a feedwater suction relief valve failing to close after actuating. The operating staff demonstrated very good performance by mitigating the secondary plant failures and successfully placed the unit into cold shutdown conditions in a controlled manner (Paragraph 4).

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

- *K. L. Kofron, Station Manager
- G. R. [unclear], 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
- *P. L. Maher, Assistant Techn. [unclear] Supervisor
- *J. M. Lewand, Regulatory Assurance
- *J. E. Nalewajka, Operations
- *L. Alexander, Lead Chemist
- *D. Skoza, Engineer

*Denotes those attending the exit interview conducted on March 13, 1992.

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

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

a. Open Items

(Closed) 456/89011-02: During the Emergency Operating Procedure (EOP) team inspection, concerns were identified with accessibility of the Reactor Coolant System (RCS) loop to Residual Heat Removal (RHR) pump suction isolation valves due to their location being greater than 15 feet above the floor without dedicated ladders being available. The licensee provided dedicated ladders and this item is closed.

(Closed) 456/90016-02(DRP): Licensee's resolution of the pressurizer low pressure instrument setpoint. The licensee conducted an extensive review of all safety-related setpoints and made corrective actions. The inspectors monitored the licensee's actions and found them to be appropriate. Most of the actions relating to setpoints involved scaling concerns. The licensee's onsite and offsite engineering organizations coordinated with Westinghouse (vendor) on evaluations and resolutions. The licensee held several discussions with the NRC Region III and the Office of Nuclear Reactor Regulation (NRR), providing information

on the evaluations and resolutions. This open item is considered to be closed.

b. Unresolved Item

(Closed) 456/91019-01(DRP): Unresolved item pending licensee's review and resolution of missed surveillances. The licensee enhanced their tracking and scheduling of technical specification required surveillances, resulting in a significant reduction in missed surveillances since July 1991. This item is closed based upon the effectiveness of the licensee's actions.

c. Violations

(Closed) 456/90023-01(DRP): Violation of various sections of Administrative Procedure BwAP 300-1, "Conduct of Operations," which resulted in the October 4, 1990 loss of reactor coolant event. The licensee developed and implemented several corrective actions in response to the violation. These included the augmentation of the control room organization with a Special Activity Shift Supervisor (SASS), station wide enforcement of the NRC policy for overtime by nuclear station personnel performing safety-related activities, enhancing pre-task briefings for activities involving risk during outage conditions, and improving control of surveillance activities. The inspectors monitored the implementation and effectiveness of the licensee's corrective actions over a one year period. During this period, the licensee entered two scheduled refueling outages and one maintenance outage. The licensee demonstrated improvement in the control of high risk activities during each of the outages. The augmentation of the SASS was noted as being effective in reducing the potential for error during the outages and, as such, was an effective corrective action to many of the problems which contributed to the October 4, 1990 inadvertent loss of reactor coolant inventory. This violation is considered to be closed.

(Closed) 456/91020-01(DRP); 457/91018-01(DRP): Technical Specification 3.3.1 was violated due to the potential of saturation of the reactor protection system overtemperature delta temperature (OT/dT) protection cards at temperatures above 597°F. The licensee implemented corrective actions, both administrative and to hardware, to provide OT/Dt protection throughout the operating temperature range as prescribed by their accident analysis. The licensee's actions were aggressive and were implemented in an expedited manner. The licensee provided details of their corrective actions to the NRC in the response to the violation dated December 6, 1991. This violation is considered to be closed.

(Closed) 457/91026-01(DRP): Licensee personnel failed to report adverse plant conditions to the operations control room shift supervisor. The licensee implemented an aggressive program to

ensure adherence to the requirement for reporting adverse conditions to the Shift Engineer. A station wide effort to inform personnel and ensure understanding of the requirement was completed within two weeks of the event. The inspectors monitored the licensee's action and noted a significant increase in notification of adverse plant conditions to the Shift Engineer. During a recent review of a personnel error pertaining to the inadvertent inoperability of a hydrogen recombiner, the inspectors noted that the Shift Engineer was immediately notified. This allowed for corrective actions to be implemented and the hydrogen recombiner to be restored in a timely fashion. This violation is considered to be closed based upon the demonstrated effectiveness of the licensee's corrective actions.

No violations or deviations were identified.

3. Licensee Event Report (LER) Review (92790)

Through review of records, the following LER was 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) 456/92001-LL

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 technical specifications; 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. The licensee continued with their efforts to improve control room demeanor. During this inspection period, the inspectors noted improvements in the pre-shift briefings. Briefings routinely contained cautions and detailed discussions associated with scheduled activities. The inspectors observed several briefings, which involved participation by senior plant management, addressing personnel errors.

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:

- Operations Review

The inspector reviewed the operational history of the units during the inspection period. Both units experienced large load reductions and increases during the period on a recurrent basis. As an example, Unit 1 made eight load reductions of between 100 and 326 Megawatts electrical (MWe). Several of these required rapid changes to maintain the electrical grid stability; the average load change rate during the period exceeded 180 MWe per hour. On one occasion, the units were required to reduce over 900 MWe and then increase the same amount within a 24 hour period to maintain grid frequency stability. These large load swings are required because of the relatively large grid network (within four states), with large generating facilities concentrated within the Commonwealth Edison system.

The inspectors observed several of these load changes and reviewed logs for the remainder. In all cases, the operating staff controlled these load following evolutions without difficulty or mishaps.

- Engineered Safety Features (ESF) Systems

Accessible portions of ESF systems and their support system components were inspected to verify operability through observation of instrumentation and proper valve and electrical power alignment. The inspectors also visually inspected components of the 480 volt and 4.16K volt systems for material conditions; no problems were noted. Routine material conditions improved during this inspection as noted by a decrease in the number of valve stem and packing leaks.

- 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 noted during the inspection period.

- Review of Shutdown Risk Considerations

During the inspection period, the inspector discussed control of the switchyard within the operations staff with the licensee. Maintenance of the switchyard is normally the responsibility of two offsite departments, Substation Construction and the Operations Analysis Department (OAD). The activities are divided, with OAD responsible for relays and Substation Construction responsible for circuit breakers, structures, and distribution lines. Shutdown risk analysis revealed that control of switchyard activities is important to ensure the availability of offsite

electrical power to mitigate events while in shutdown conditions to prevent possible core damage.

The licensee took several prompt interim actions prior to the inspection period to ensure availability of offsite power supplies. Both offsite departments are required to adhere to the station's procedure for placing equipment out-of-service (OOS). This ensures that the control room supervisor's approval must be obtained prior to entering the switchyard and starting any work activity. This provides positive control by the operations staff on the availability of the switchyard to ensure that shutdown risk conditions can be mitigated. Additional long term actions are being evaluated to address any other possible concerns with control of the switchyard availability.

The inspector found the licensee's actions to be proactive and responsive to industry and NRC concerns with availability of the switchyard during shutdown risk conditions.

- Security

During the inspection period, the inspectors monitored the licensee's security program to ensure that observed actions were being implemented according to their approved security plan. No problems were noted during the 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. Although portions of the lower levels of the turbine building continue to have housekeeping conditions that are not comparable to the majority of the plant, efforts to improve those areas are resulting in some initial improvements. The majority of concerns are related to the heater drain pumps and their continual steam leaks. Several of the recently overhauled heater drain pumps have demonstrated good performance without steam leaks; however, heater drain pumps' performance is not consistent.

- Events

During the inspection period, several events occurred. The inspectors' and licensee's reviews of the events, determination of root causes, and subsequent corrective actions are described below. In addition, the inspectors' evaluation of the licensee's actions are also described:

On January 28, 1991, the Unit 1 Nuclear Station Operator (NSO) experienced problems charging a Safety Injection (SI)

accumulator due to valve lineup problems with the nitrogen (N₂) charging system.

After an annunciator in the control room alarmed to identify the low accumulator pressure condition (<612 psig), the NSO verified through an equipment operator that the N₂ system was available to charge the accumulator as required by BWOP SI-8, "Increasing SI Accumulator Pressure." Subsequently, attempts to charge the accumulators were unsuccessful. Meanwhile, the licensee entered Technical Specification (TS) LCO 3.5.1.a after the accumulator pressure dropped below the TS limit of 602 psig. It was not until over a half hour after the low pressure condition was identified that a valve misalignment was discovered by the equipment operator. The accumulator was successfully charged after the valve misalignment was corrected and the LCO was exited within the time requirement.

The NSO, in a narrative documented in the NSO log, indicated that the problem with the valve misalignment was due to poor procedural guidance associated with the newly installed N₂ system modification. The modification was previously installed to provide a high pressure N₂ source from a tube trailer and to bypass the existing compressor, after it was discovered that the compressor was leaking oil to the accumulators. The NSO also noted that critical drawing MS-69, "Diagram of Radioactive Waste Gas," located in the control room, was not updated to include that portion of the modification that was installed to bypass the compressor.

The inspectors reviewed the applicable procedures used to charge the accumulators with the N₂ system and determined that they were adequate. The inspectors noted, however, that BWOP SI-8 did not reference the procedure to be used to verify that the N₂ system was available to the accumulators. This condition contributed to the problems that occurred because the procedures used to verify N₂ system availability prior to and during installation of the system modification had not been deleted. Installation of the modification had been delayed on several occasions due to revisions to the design change package and priority considerations. A temporary alteration utilizing the high pressure tube trailer connected to a flexible hose connection had been installed in the interim to alleviate the problem of oil leaking past the compressor into the accumulators.

The obsolete procedures used to operate the temporary alteration and the now bypassed compressor were not deleted and the critical drawing was not updated because the modification had not yet been tested for operability, even though it was being operated.

Administrative Procedure, BwAP 2320-12, "Plant Modifications Designed by Engineering," does not require procedure and critical drawing updates until modifications are tested for operability by the technical staff. However, BwAP 2320-12 does not address the unique situation of having a design modification installed and in use, but not declared operational. This condition also contributed to the event.

As immediate corrective action, on February 3, 1992, the licensee issued a change to BwOP SI-8 to specifically reference existing BwOP NT-9, "Nitrogen Tube Trailer Operation," to verify N₂ system availability. An operator aid was also issued on that date to clarify operation of the N₂ system until the modification was declared operational and all required training was conducted. As long term corrective action, the licensee has committed to review the modification process to address the problems noted.

The inspectors, in parallel with the licensee's investigation into the valve lineup problems, discovered that valve ONT-099, the N₂ compressor bypass, was closed on January 26, 1992, to troubleshoot a leak in the system. This valve isolated the accumulators from the high pressure tube trailer used to charge the accumulators. The valve remained closed until it was discovered during the problems experienced on January 28, 1992. ONT-099 was required to be maintained in the normally open position by BwOP NT-M1/M2, the N₂ system mechanical lineup procedure. The inspectors also discovered that two other valves, SI 8965 A/B, N₂ system header isolation to the accumulators, were maintained open for an indefinite period of time for convenience and ALARA considerations. These valves were required to be normally closed per BwOP SI-M1/M2.

Administrative Procedure BwAP 340-2, "Use of Mechanical and Electrical Lineups," required that, when it was determined a component was required to be in a different position from that listed in the BwOP lineup for longer than one shift turnover, the "Component Abnormal Position Log" was to be used to record the status of that component. In addition, the procedure required that a 10 CFR 50.59 screening be performed. The abnormal position of ONT-099 and SI 8965 A/B were not documented in the log and the 50.59 screenings were not performed as required. Failure to comply with station procedures is considered to be a violation (50-456/92004-01(DRP)). The abnormal valve position was documented on shift turnover sheets; however, this method proved not to be adequate control because the equipment operator was not cognizant of the abnormal condition.

On February 5, 1992, Unit 1 was shutdown from full power to repair an unisolable leak in the high pressure supply header

of the Electrohydraulic (EH) system. The EH system leak originated from a 1/3" crack in the heat affected zone of a 1" socket weld tube fitting which attaches the header to the EH reservoir. The licensee determined that the crack resulted from stress fatigue due to pressure surges from unloader valve cycling. The function of the unloading valve is to maintain EH system pressure by directing EH pump discharge fluid to the supply header. As action to prevent recurrence, the licensee is evaluating the installation of constant pressure pumps to eliminate the stress caused by the unloader valve operation. Unit 2 returned to power operations on February 8, 1992.

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. At that time, it was discovered that licensee personnel had mistakenly started work on the "B" recombiner after the "A" recombiner was taken out-of-service earlier for preventive maintenance. The licensee returned the "B" recombiner to service and exited the LCO within the required time after successful functional testing. Initial licensee investigation determined the root cause to be personnel error. In response to repeated events of a similar nature in the recent past at the station, the licensee established a corporate team to investigate the problems. The inspectors will review the results of the investigation and corrective actions as an Unresolved Item (50-457/92004-02(DRP)).

On February 25, 1992, Unit 2 received a turbine/generator trip and reactor trip from 100% power. Prior to the trip, the Digital Electrohydraulic control (DEHC) system was in manual to clear a problem with the Economic Generating Control system. While shifting back to the automatic mode of turbine operation, the turbine throttle valves received a closure signal. The closure of the throttle valves resulted in a turbine/generator trip and subsequent reactor trip. Auxiliary feedwater automatically started due to the steam generator shrink transient and all systems responded as expected except for a feedwater suction relief valve and the source range nuclear instruments (NI) system. The relief valve did not close after actuation and required manual isolation. The source range NI's did not automatically energize after the trip due to intermediate range channel N-36 not decreasing to the P-6 setpoint. This was due to the conservative setting of the N-36 channel to ensure indication in the upper region of the intermediate range during a transient. The licensee placed the unit in cold shutdown to repair the feedwater suction relief valve and several minor degraded conditions on various components in the feedwater and condensate system. The licensee

determined that the root cause of the trip was a failed card in the DEHC system circuitry. Unit 2 returned to power operation on February 29, 1992. The operations staff responded to the trip and quickly mitigated the effects of secondary plant component failures. Several offshift operators responded to the control room and assisted in a controlled manner. Plant personnel from several departments responded and assisted the operations staff in isolating the stuck open feedwater suction relief valve. The isolating of the relief valve required manual manipulation of a large stroke isolation valve in an adverse environment due to the steam from the open relief valve. The plant personnel demonstrated good teamwork to close the isolation valve and took appropriate personnel safety actions to avoid the potential of injury from hot piping and steam.

On February 26, 1992, the inspectors observed that an NSO was using the N₂ high pressure bottle bank to pressurize the SI accumulators, in lieu of the tube trailer. Prior to the installation of the tube trailer per the system modification described earlier, the bottle bank had been used in conjunction with the compressor to charge the accumulators. The intent of the design change, however, was to charge the accumulators directly from the tube trailer and use the bottles only when the trailer was unavailable. In response to the inspectors' concerns regarding continued problems with the N₂ system operation despite corrective actions instituted after the January 26, 1992 event, the licensee issued a daily order to provide additional clarification to operating personnel of system operation. The inspectors will continue to monitor the effectiveness of the licensee's corrective actions to the problems with the operation of the N₂ system.

The inspectors also monitored various records, such as tagouts, jumpers, shift logs and surveillances, daily orders, maintenance items, various chemistry and radiological sampling and analyses, third party review results, overtime records, QA and/or QC audit results, and postings required per 10 CFR 19.11. During this inspection period, the Safety Injection Accumulator Boron sample was inappropriately documented as meeting technical specifications. This is documented as an Unresolved Item in Paragraph 6, and will be addressed in a subsequent inspection report.

One violation and one unresolved item were identified.

5. Monthly Maintenance Observation (62703)

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 technical specifications.

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:

- Repairs to Unit 1 Electrohydraulic system.
- Repairs to Unit 2 feedwater suction relief valve.
- Troubleshooting of Unit 2 digital electrohydraulic control system.

During this inspection period, personnel error resulted in placing both units simultaneously in Technical specifications 3.0.3. Details of the event were discussed in Paragraph 4 of this report.

No violations or deviations were identified.

6. Monthly Surveillance Observation (61726)

The inspectors observed several of the surveillance tests required by technical specifications during the inspection period and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that results conformed with technical specifications 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:

- Calibration of Unit 2 source range nuclear instrumentation.
- Units 1 and 2 digital electrohydraulic control system operability.

On March 9, 1992, a Unit 1 Safety Injection (SI) accumulator sample was found to be out of the technical specification required range of 1900 to 2100 parts per million (ppm) Boron. Both the Chemistry Department Supervisor and the Shift Control Room Engineer inappropriately signed the surveillance 1BwOS SI-1a, "Safety Injection Systems," as satisfying the technical specification requirement. The actual sample was 2117.6 ppm Boron, greater than the requirement of 1900 to 2100 ppm. The licensee is currently addressing this and several other apparent personnel errors. This is considered to be an Unresolved Item (50-456/92004-03(DRP)). Since the inspection is currently in progress to independently determine the root causes, the details of the inspection will be documented in the next inspection report.

No violations or deviations were identified.

7. Safety Assessment and Quality Verification

The inspectors reviewed various programs associated with the licensee's root cause determination processes during this inspection period. Previously, the licensee's root cause determination was found to be marginal during the last Systematic Appraisal of Licensee's Performance issued on July 19, 1992. The licensee's efforts to improve in this area included development of the Problem Investigation Report (PIR) process. The PIR process uses various root determination methods, including Barrier-Target and Causal Factors analysis. The inspectors noted an improvement in the licensee's ability to determine root cause as noted by the following examples:

PIR 1-92-002, Braidwood Unit 1 - calibration of Residual Heat Removal System suction relief valves setpoints to values above Amendment 33 of the Technical Specifications. On January 15, 1992, the licensee discovered during bench testing of the relief valves that their setpoints were adjusted to above 450 psig, instead of less than or equal to 450 psig as prescribed by Amendment 33 of the Technical Specifications.

The licensee determined that the affected valves had been calibrated in October 1991 per the approved surveillance procedure prior to the approval of Amendment 33. However, on January 15, 1992, the surveillance procedure was found to be in conflict with Amendment 33 and had not been revised.

The licensee's immediate corrective actions were to implement temporary procedure changes to resolve the difference between Amendment 33 and surveillance procedures. Additionally, the licensee evaluated other possibly affected valves and found no other problems. Permanent procedure changes were initiated.

The licensee determined that implementation of the technical specification amendment was not adequately controlled. A review of the amendment implementation process is currently being performed as requested by the PIR.

PIR 2-92-001, Braidwood Unit 2 - inadvertent inoperability of the 2A Containment Spray (CS) Pump. On January 13, 1992, while performing a preventive maintenance activity to change out the lubrication oil on the 2A Residual Heat Removal (RHR) System Pump, the 2A CS pump was rendered inoperable due to the lubrication oil being erroneously drained.

The licensee's review revealed that several behavioral and causal factors applied to the event. Although the senior technician involved in the event had previously successfully performed the job task, the senior technician did not apply self-checking work practices when identifying the pump. The technician failed to recognize several component identification tags on the 2A CS pump

and valves or markings on the room's interior walls indicating that the technician was in the wrong room.

Another causal factor was associated with the technicians not notifying operations personnel of the error in a timely fashion after discovery of the error. The technicians involved (fuel handling personnel) were not individually aware of the requirements to notify shift personnel of inadvertent plant conditions. The requirements to report inadvertent plant conditions are contained within the Operations Department's administrative procedures, which do not address fuel handling personnel, and are not contained within other departments' procedures.

The immediate corrective actions returned the 2A CS pump to operable conditions. Corrective actions addressing the determined root causes and causal factors included:

- Developing a detailed checklist to ensure proper equipment verification prior to performing preventive maintenance activities. (Additionally, the checklist was expanded to include verification of correct lubricant prior to performing the activity.)
- Plant personnel were made aware of the requirements to report directly to shift personnel any discovered abnormal plant conditions.
- The requirement to report inadvertent plant conditions was removed from the Operating Department's procedure and included in a new administrative procedure applicable for all station personnel.

PIR 2-92-002, Braidwood Unit 2 - an Out-Of-Service (OOS) card was placed on the wrong isolation point and was not detected by the independent verification. On January 13, 1992, the Radiation Monitor 2PRO2J was requested to be OOS for scheduled maintenance. Personnel performing the OOS had misinterpreted "2PRO2J BKR" as being the electrical isolation breaker on the local control panel 2PRO2J for Radiation Monitor 2PRO2J. The correct location was on the Motor Control Cubicle (MCC) 233X3. Prior to performing the maintenance activity, a technician walked down the OOS as required by procedures. The technician noted the error and the correct breaker was opened. The OOS was removed from 2PRO2J and correctly placed on MCC 233X3.

The licensee's PIR found that the personnel hanging the OOS cards failed to use the OOS form which denoted MCC 233X3 as the isolation point. The personnel had failed to perform self-checking practices as prescribed by station policy. Additionally, the independent verification process failed to detect the error

because the verifier did not use "apart in time" practices and was influenced by the presence of the person hanging the OOS card.

The licensee found that both the self-checking practice and independent verification process were not effective in preventing errors similar to this event. Corrective actions included reviewing effective practices and processes at other facilities. Based upon these reviews, a self-checking program and independent verification methods are being developed.

The inspector's review of the above PIRs found them to be appropriate and complete. The corrective actions addressed the root causes. There are indications that the licensee is improving in their ability to identify and address problems. Since the corrective actions associated with these PIRs are long term, the effectiveness of resolving these identified problems cannot be currently determined. The effectiveness of corrective actions will be monitored and documented in subsequent inspection reports.

No violations or deviations were identified.

8. Report Review

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

The inspector also reviewed the licensee's Monthly Plant Status Report for January 1992.

No violations or deviations were identified.

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraph 4, 5, and 6.

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 March 13, 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.