

U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Reports No. 50-254/92016 (DRP); 50-265/92016 (DRP)

Docket Nos. 50-254; 50-265

License Nos. DPR-29; DPR-30

Licensee: Commonwealth Edison Company
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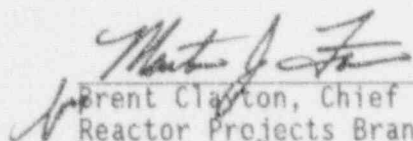
Facility Name: Quad Cities Nuclear Power Station, Units 1 and 2

Inspection At: Quad Cities Site, Cordova, Illinois

Inspection Conducted: June 2, 1992, through July 13, 1992

Inspectors: T. E. Taylor
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Approved By:


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Reactor Projects Branch 1

7/27/92
Date

Inspection Summary

Inspection from June 2, 1992, through July 13, 1992 (Report Nos. 50-254/92016(DRP); 50-265/92016(DRP))

Areas Inspected: Routine, unannounced safety inspection by the resident and regional inspectors of concern followup; licensee action on previously identified items; licensee event report review; operational safety verification; monthly maintenance observation; monthly surveillance observation; training effectiveness; report review; events; and meetings and other activities.

Results: Of the areas inspected, one violation in paragraph 3 was identified. One unresolved item in paragraph 5.b and one open item in paragraph 10 were identified.

Plant Operation

Performance in this area was steady. One open item was identified concerning poor out of service implementation resulting in an inadvertent loss of instrument air. Operators took appropriate actions to prevent the loss from effecting unit operations. One unresolved item associated with verification of plant records was identified.

Maintenance and Surveillance

Overall maintenance performance was good. One instance of maintenance personnel working on the wrong unit was identified.

Engineering and Technical Support

Performance in this area was acceptable. One violation concerning fire protection procedures was identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

- R. L. Bax, Station Manager
- *G. C. Tietz, Technical Superintendent
- *G. F. Spedl, Production Superintendent
- *B. Strub, Assistant Superintendent - Operations
- R. Stols, Superintendent of Programs
- J. Fish, Master Mechanic
- *J. Sirovy, Services Director
- *T. Tamlyn, Engineering and Nuclear Construction Site Manager
- D. Craddick, Assistant Superintendent - Maintenance
- B. Tubbs, Operating Engineer - Unit 1
- J. Kopacz, Operating Engineer - Unit 2
- J. Wethington, Assistant Tech Staff Supervisor
- D. Bucknell, Assistant Technical Staff Supervisor
- A. Misak, Regulatory Assurance Supervisor
- R. Walsh, Technical Staff Supervisor
- *C. Smith, Nuclear Quality Program Supervisor
- K. Leech, Security Administrator
- B. McGaffigan, Assistant Superintendent - Work Planning
- J. Hoeller, Training Supervisor
- *D. Kanakares, Regulatory Assurance
- *A. Pedersen, Consultant
- *R. Moravec, Engineering and Nuclear Construction

*Denotes those attending the exit interview conducted on July 13, 1992, and at other times throughout the inspection period.

The inspectors also talked with and interviewed several other licensee employees, including members of the technical and engineering staffs; reactor and equipment operators; shift engineers and foremen; electrical, mechanical, and instrument maintenance personnel; and contract security personnel.

2. Concern Followup

AMS No. RIII-92-A-0033

A concern was raised at the Quad Cities station that on two occasions the licensee drained the reactor vessel with all the emergency core cooling systems inoperable, in violation of Technical Specification (TS) requirement 3.5.F.2. Review of operations logs and procedures, and interviews with personnel by the inspector failed to substantiate the concern. However, due to regulatory initiatives concerning shutdown risk, the inspectors are reviewing the adequacy of the TS to ensure adequate core protection during shutdown. The licensee has performed

similar reviews and intends to improve the TS requirements to address this issue.

A concern was also raised that in order to pass secondary containment leak rate tests, personnel would tape interlock doors closed. Based on appropriate personnel interviews and review of documentation the inspectors concluded that the concern was partially validated. On February 4, 1990, tape was utilized to achieve containment integrity. However, the test had been declared a failure and appropriate actions per the Technical Specifications had been implemented. The tape was utilized in an attempt to locate sources of leakage requiring repair. Taping of various other components (as described in Licensee Event Report 254/90-002) also was utilized. As atmospheric conditions changed during the test, tape was removed from the interlock doors, but, building to atmosphere differential pressure improved to acceptable values. However, not all tape that was placed subsequent to test failure was removed prior to determining the test successful. The leakage paths that were identified and remained sealed pursuant to test success were on-site reviewed by appropriate personnel and approved as satisfactory. Routine surveillance and expeditious permanent repair were conditional to the approval of the temporary seals. Furthermore, due to temperature correction criteria pursuant to NRC Information Notice 88-76, which were not applied during the test, the licensee determined that the secondary containment was operable prior to any taping activities.

These concerns are closed.

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

(Closed) Unresolved Item (254/88021-5b(DRS); 265/88021-5b(DRS)): In the event of a control block (control room, cable spreading room, and auxiliary electric room) fire, it was identified that there was a potential loss of 480 Vac switchgear 18 concurrent with a spurious closure of the reactor core isolation cooling (RCIC) inboard steam supply isolation valve. During the October 28, 1988, enforcement conference, the licensee presented new information regarding a walkdown of the post-fire safe shutdown procedures that occurred subsequent to the inspection. The licensee stated that the 35 minute time line criteria, which was based on a General Electric analysis, was measured and found acceptable.

During this inspection the inspectors observed a drill that encompassed the loss of the 480 Vac switchgear concurrent with a spurious valve closure. The drill postulated a fire in the auxiliary electric equipment room, which required personnel to exit the control room. The plant personnel proceeded to their respective locations in a timely manner. The operators simulated proper isolation actions to 430 Vac bus 18 prior to cross connecting to 480 Vac bus 19. The operators also simulated proper restoration of critical Motor Control Center 18-1A during an inadvertent closure of the RCIC inboard steam supply isolation valve due to high impedance faults. The operators did an excellent job

coordinating the different operations, and establishing and maintaining control of the reactor. Directions and acknowledgement of these directions were very good. However, the portable radios (without repeaters) were marginal at best. New radios that provide better transmission and reception will be tentatively available by January 1, 1994. The drill successfully demonstrated that the operators could recover from the loss of the RCIC inboard steam isolation valve within 35 minutes. This unresolved item is closed.

During the drill on July 8, 1992, the inspector noted that safe shutdown procedures QARP 600, 700, 800 and 1200, did not provide measures to positively ensure isolation of safe shutdown equipment from associated non-safety circuits in the event of a disabling fire, which is required by 10 CFR 50, Appendix R. The procedures did not require that 480 Vac bus 18 be isolated prior to cross connecting it with bus 19. (Bus 18 normal power is from a non-safety source. The fire scenario assumes that normal power is lost. In the event normal power is inadvertently restored to 480 Vac bus 18 after cross connecting with 480 Vac bus 19, the power sources may be out of phase and result in potential damage to both busses and loss of power to safe shutdown equipment.) Based on the operators' performance during the drill, the safety significance of this issue is reduced. Even without procedures, operator actions resulted in establishing power to safe shutdown equipment that was not affected by electrical faults from the fire. However, the lack of measures in the safe shutdown procedures to positively ensure isolation of the 480 Vac bus 18 from non-safety circuits in the event of a disabling fire within the auxiliary equipment room is considered a violation of section III.L of Appendix R to 10 CFR 50, which requires isolation from non-safety circuits for safe shutdown equipment, and procedures to implement safe shutdown (254/265-92016-01(DRS)).

(Closed) Open Item (254/90002-01(DRP)): "Load Drop Due to Heater Transient." Unit 1 was at 70% power and increasing to full load when the "D" train feedwater heater experienced high levels followed quickly by moisture separator drain tank high levels. Power was reduced to 45% and feedwater heater level control was regained. During an outage, the feedwater heater level sensing taps had been moved from the flash side to the drain cooler side of the heaters. The level sensing taps were moved back to the flash side. The operating engineer involved was counseled on the importance of utilizing proper procedures when altering normal configuration of plant equipment. The event was discussed at the operations tailgate meeting. A review of personnel errors since the event indicate this to be an isolated case. This item is closed.

(Closed) Unresolved Item (265/90012-01(DRP)): "Removal of Wrong Electromatic Relief Valve (ERV) Pilot Valve." Mechanical maintenance personnel failed to positively verify they were on the correct ERV prior to removing the pilot valve installed in the drywell. The safety consequences of the event were minimal, in that the error was discovered during the outage and adequate reinstallation and surveillance was performed. However, the error was indicative of weak personnel performance, particularly regarding self checking and verification prior

to performing work. Multiple corrective actions, including increased management overview of field work, increased utilization of discipline, improved work instructions, "Focus" meetings, and management emphasis on error free performance have been implemented. Concerning personnel performance regarding safety related systems, improvements in personnel performance and work control have occurred pursuant to this event. This item is closed.

(Closed) Notice of Violation (254/90014-01(DRP)): "Lack of Adequate Acceptance Criteria to Demonstrate Operability Concerning Technical Specification Required Surveillances." This item dealt with the acceptance criteria utilized for the monthly low pressure coolant injection pump operability surveillance. The criteria failed to verify the pumps could meet design requirements as stated in the FSAR. The procedures for this example were adequately corrected, however, in the response to the Notice the licensee was requested to review existing criteria for all Technical Specification surveillances. The review was not entirely complete, in that, Notice of Violation 254/91017-01(DRP) was issued due to inadequate corrective action to preclude repetition concerning this matter. Therefore, since this issue is being tracked by a more recent violation, this item is closed.

(Closed) Open Item (254/90017-02(DRP)): "Failure of Emergency Core Cooling System (ECCS) Floor Drain Check Valves." The 1A reactor building sump pump was out of service (OOS). The sump overflowed causing backflooding into the 1A core spray (CS) and reactor core isolation cooling (RCIC) room. The systems were declared inoperable until drain plugs were installed. The floor drain check valve failure was determined to be a design problem. The type of check valve was not effective for controlling slow leaks. In early 1991, both units had stainless steel ball check valves installed. The valves appear to be working adequately as evidenced by no further back flooding of the RCIC and CS rooms. This item is closed.

One violation and no deviations were identified.

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

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to verify reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been, or will be, accomplished in accordance with Technical Specifications (TS):

- a. (Closed) LER 254/89003-LL: Manual Reactor Scram in Response to Erratic Main Turbine Valve Bypass Valve Operation.
- b. (Closed) LER 254/89022-L1: Unit 1 HPCI Inoperable Due to Inadvertent Deluge System Actuation; cause unknown.

- c. (Closed) LER 254/89023-LL: Violation of Technical Specification concerning Review of Temporary Procedures.
- d. (Closed) LER 265/92-019-LL: Locked High Radiation Door Lock Malfunctioned.

Additionally, the inspector reviewed the licensee's Deviation Reports (DVRs) generated during the inspection period. This was done in an effort to monitor the conditions related to plant or personnel performance, potential trends, etc. DVRs reviewed during the period appeared to be properly initiated and dispositioned as required by the applicable procedures and the QA manual.

No violations or deviations were identified.

5. Operational Safety Verification (71707)

During the inspection period, 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. This was done on a sampling basis through routine direct observation of activities and equipment, interviews and discussions with licensee personnel, independent verification of safety system status, and review of facility records.

On a sampling basis the inspectors daily verified the following: adequate control room staffing and coordination of plant activities with ongoing control room operations; operator adherence with approved procedure operation as required by Technical Specification (TS); adequate monitoring of control room instrumentation for abnormalities; that onsite and offsite power was available; plant and control room visits were made by station managers; and safety parameter display system (SPDS) operation.

During tours of accessible areas of the plant, the inspectors made note of general plant and equipment conditions, including control of activities in progress (maintenance/surveillance), observation of shift turnovers, general safety items, etc. The specific areas observed were:

- a. The off normal indication (ONI) control room (CR) instrument identification procedure has been replaced with the control room nuclear work request (NWR) program. This was due to concerns raised by CR operators and NRC residents regarding problems in the ONI program. The ONI program was replaced for the following reasons:
 - * To provide more direct information on the deficiency tag for the CR operators.
 - * Clarify when a deficiency tag can be placed and when it can be removed.

- * The ONI procedure prioritization method determining when an instrument would be repaired had been ineffective.

The new program procedure clarifies when an instrument is deficient, but not degraded enough to effect operator judgment. The NWR tags, utilized by the new program, provide information on the problem with the instrumentation and what other instrument may provide similar information. Concurrent with the new program implementation, a new procedure providing guidance to prioritize work requests was also approved. A highlight of the new program is that it allows the operators to set priorities for repairs.

The program identifies all work items associated with equipment indicating in or controlled from the control room. Due to the expanded scope over the previous program the number of items tracked for the control room has increased. Work items previously identified on caution cards are now included as part of the control room work request total.

b. Verification of Plant Records

In response to concerns identified at the LaSalle Nuclear station, the licensee has implemented a review of operator rounds sheets. Also, Information Notice 92-30 addresses falsification of plant records. This was generated to alert licensees to NRC's concern that logs at some plants may be a problem. Quad Cities review of operators' rounds identified one case where validity of logs could not be substantiated. This item is considered unresolved pending further review (254/92016-02(DRP)).

c. Engineered Safety Features (ESF) Systems

Accessible portions of ESF systems and components were inspected to verify: valve position for proper flow path; proper alignment of power supply breakers for proper actuation on an initiating signal; proper power supply to components required by TS or the FSAR; and the operability of support systems essential to system actuation or performance through observation of instrumentation and/or proper valve alignment. The inspectors also visually inspected components for leakage, proper lubrication, cooling water supply, etc. No problems were identified in this area.

d. Radiation Protection Controls

The inspectors verified that workers were adhering to health physics procedures for dosimetry, protective clothing, frisking, posting, etc., and randomly examined radiation protection instrumentation for use, operability, and calibration. On June 6 and 10, 1992, the licensee found high radiation barriers unsecured. One involved a faulty door latch, the other was due to personnel leaving the turbine shield wall area without closing the

barrier gate. Region III radiological inspectors are evaluating the significance of these events.

e. Security

The inspectors, by sampling, verified that persons in the protected area (PA) displayed proper badges and had escorts if required; vital areas were kept locked and alarmed, or guards posted if required; and personnel and packages entering the PA received proper search and/or monitoring. No concerns were identified.

f. 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. A number of minor material discrepancies have been noted. The licensee is evaluating resolution of these items. Overall, areas of high visibility are well maintained.

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, quality assurance and quality control audit results, and postings required per 10 CFR 19.11.

No violations or deviations were identified.

6. Monthly Maintenance Observation (62703)

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 considered during this review: the limiting conditions for operation were met while components or systems were removed from and restored to service; approvals were obtained prior to initiating the work; functional testing and/or calibrations were performed prior to returning components or systems to service; activities were accomplished by qualified personnel; and proper radiological and fire prevention controls were implemented.

The following maintenance activities were observed and reviewed:

Unit 0

"1/2 A" Diesel Fire Pump Governor Repair

Unit 1

Fuel Pool Demineralizer Dome Drain Valve Repair
1-1601-20A Vacuum Breaker Repair
1-1001-36B Four Bolts Of The Operator To Yoke/Inspect And Repair
As Necessary

Unit 2

Unit 2 Diesel Generator #8 Exhaust Chamber Thermocouple Repair

The inspectors monitored the licensee's work in progress and verified that it was being performed in accordance with proper procedures and approved work packages. One exception noted is addressed below.

Personnel Error During Radiation Waste Valve Repair

While performing work request Q98458, repair of the non-safety related Unit 1 fuel pool demineralizer dome drain valve (1-1904-43A), mechanical maintenance personnel in error removed the bonnet of the identical valve on the opposite unit. The mechanics followed proper guidelines for repairing the valve and made the proper notification once they realized the unisolated system was breached. The process line was one inch in diameter and was isolated expeditiously, resulting in negligible inventory loss to the spent fuel pool.

The inspectors reviewed documentation and discussed the error with personnel involved. The root cause appeared to be personnel error, due to failure of the mechanic to positively verify which piece of equipment required repair. Management controls and pre-job preparation appeared adequate for the complexity and significance of the task. The event is indicative of weakness in the self check program in this area. The root cause analysis and corrective actions taken by the licensee appeared adequate (NTS 2545439203800). The inspector has no further concerns regarding this matter.

No violations or deviations were identified.

7. Monthly Surveillance Observation (61726)

The inspectors observed surveillance testing 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 by personnel other than the individual directing the test; and that deficiencies identified during the testing were properly resolved by the appropriate personnel.

The inspectors also witnessed portions of the following test activities:

Unit 0

QCOS 2300-5 Quarterly HPCI Pump Operability Test
QOP 5750-9 Control Room Ventilation "A" Train Air Handling
Unit With "B" Train Air Filtration Unit Test

Unit 1

Technical Staff Functional Test #1 Beta Panel Connections For
M 4-1-87-51B
QCOS 1000-9 Quarterly RHR Power Operated Valve Test (For
1-10001-36B)
QOS 1000-4 Quarterly RHR Service Water Pump Operability Test
QOS 6600-1 1/2 DG Monthly Operability Run

No violations or deviations were identified.

8. Training Effectiveness: (41400, 41701)

The effectiveness of training programs for licensed and non-licensed personnel was evaluated by the inspectors, by witnessing performance of surveillance, maintenance, and operational activities. Except for the instrument air system event discussed below, personnel appeared to be knowledgeable of tasks being performed. In general, activities performed indicated an effective training program.

No violations or deviations were identified.

9. Report Review

During the inspection period, the inspector reviewed the licensee's Monthly Performance Report for June 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 May 1992.

No violations or deviations were identified.

10. Event Followup (93702)

Isolation of the Cooling Water Supply for Instrument Air Compressors

On June 1, 1992, during an out of service activity for the domestic water system, an inadvertent loss of the instrument air compressors occurred. Isolation of the domestic water system, which was supplying cooling water for the instrument air compressors, caused the compressors to trip on high temperature. The normal cooling medium, service water (SW) system, was isolated from the instrument air compressor heat

exchangers due to plugging problems. A temporary alteration was installed using domestic water.

Contributing factors to the event included:

- * The domestic water piping and instrumentation diagram (P&ID) was illegible. (This is the second recent event associated with P&ID diagram configuration control.)
- * No identification tags were on the system isolation valves.
- * Operations personnel lack of domestic water system knowledge.
- * The temporary alternation (TA) procedure has TAs grouped by area. (The valves to isolate the individual compressors and identified in the TA are in the turbine building and the system isolation is in the service building.)
- * Controlled critical P&IDs are used by the operation communication center to prepare OOS tagouts. The domestic water P&ID is not with the controlled critical P&IDs nor was the instrument air controlled critical P&ID updated to reflect the TA.
- * A permanent modification for the compressor's cooling water supply has not been resolved in over a year.

The systems involved were balance of plant. There is a concern that process weaknesses exhibited during this event could be carried over to safety related systems. This is considered an open item (254/92016-03(DRP)).

One open item and no violations were identified.

11. Control of Radioactive Materials and Contamination, (IP 83750)

The inspector toured the reactor and turbine buildings to observe radiological controls and ongoing work in the radiologically controlled area (RCA). Radiological postings and controls were satisfactory and, with the exception of poor housekeeping in one of the RHR rooms, the station appeared generally well maintained. The contaminated area of the station has been reduced to about fifteen percent which meets the stations goal for non outage conditions.

The inspector accompanied a shift operator on his routine reactor building basement rounds which included the torus, residual heat removal (RHR), high pressure coolant injection (HPCI), and core spray rooms in both units. Five dressouts in minimal PCs (booties and gloves) were needed to accommodate the several transitions between contaminated (e.g., RHR and HPCI rooms) and clean (e.g., torus) areas as compared to the former status which required a single full clothing dressout. Licensee plans are to further decontaminate the basement and to maintain it clean, an effort that could require considerable dose expenditure. ALARA representatives were aware of this potential problem and have recommended that some of the more dose intensive areas not be recovered at this time.

The inspector reviewed the calibration and QC checks performed on the IPM-7 whole body friskers. During this review, it was noted that the QC check source used for alarm set points was the same as that used for the full calibration and whose strength was several orders of magnitude greater than the trip setting. The licensee stated that sources of about the same strength as the trip setting were recently ordered and will be used upon arrival.

No violations or deviations were identified.

12. Management/Plant Status Meeting

A meeting was held on July 10, 1992, between the station manager, the station programs supervisor, Region III management, and members of each of their staffs. The purpose of the meeting was for the licensee to formally present and discuss the 1992 management plan with NRC Region III.

No violations or deviations were identified.

13. Unresolved Items

Unresolved items are matters which require more information in order to ascertain whether it is an acceptable item, an open item, a deviation or a violation. An unresolved item disclosed during this inspection is discussed in paragraph 5.b.

14. Open Items

Open items are matters which: have been discussed with the licensee; will be further reviewed by the inspector; and involved some actions on the part of the NRC, licensee, or both. Open items disclosed during the inspection are discussed in paragraph 10.

15. Exit Interview

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