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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-254/92008(DRP); 50-265/92008(DRP)

Docket Nos. 50-254; 50-265

License Nos. DPR-29; DPR-30

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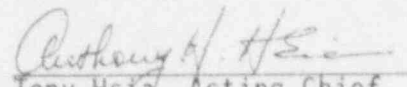
Facility Name: Quad Cities Nuclear Power Station, Units 1 and 2

Inspection At: Quad Cities Site, Cordova, Illinois

Inspection Conducted: February 16, 1992, through March 30, 1992

Inspectors: T. E. Taylor  
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4/15/92  
Date

Inspection Summary

Inspection from February 16, 1992, through March 30, 1992 (Reports No. 50-254/92008 (DRP); 50-265/92008(DRP))

Areas Inspected: A routine, unannounced safety inspection was conducted by the resident and regional inspectors of licensee action on previously identified items; licensee event report review; operational safety verification; monthly maintenance observation; monthly surveillance observation; training effectiveness; refueling activities; report review; safety assessment and quality verification events; and meetings and other activities.

Results: Of the areas inspected, no violations were identified. However, two unresolved items are described in paragraphs 4 and 11. The first item deals with exceeding the technical specification (TS) reactor vessel lower head minimum temperature limit and the second concerns the operability of the residual heat removal (RHR) system with blockage of the pump room cooler beyond the design margin.

Operations

Performance in this area was considered good. One unresolved item was identified at the end of the report period relating to the unit hydrostatic test. During performance of the test, operations personnel failed to adequately monitor one of the non-beltline vessel bottom temperatures. This item is considered unresolved pending further review.

Maintenance and Surveillance

Performance in this area was considered steady. Refuel outage activities were conducted in a professional manner. One unresolved item concerning post maintenance testing of a Yarway level switch was closed. A possible extension of the refuel outage may occur to address proposed under voltage modifications.

Engineering and Technical Support

Performance in this area was considered mixed. Engineering support for plant operations and maintenance was good. However, engineering evaluation of the Unit 2 residual heat removal pump room coolers is a concern. Inspection of the room cooler heat exchangers identified tube plugging beyond the design margin. Previously on Unit 1 a similar condition occurred. The engineering group did not evaluate the potential for plugging on Unit 2 heat exchangers at that time. This issue is unresolved pending further review.

DETAILS1. Persons ContactedCommonwealth Edison Company (CECo)

- \*R. Bax, Station Manager
- \*G. Tietz, Technical Superintendent
- G. 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
- \*D. Thayer, On-Site Nuclear Safety

\*Denotes those attending the exit interview conducted on March 30, 1992.

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

(Closed) Unresolved Item 254/89027-02: Inadequate post maintenance test instructions for Yarway level switch 1-263-59B. This item dealt with the installation of the above switch, which was handled as a like for like replacement. Post maintenance testing verified that the switch changed state, but did not verify in which direction the change occurred. This omission contributed to the installation of a switch that was not like for like, and was considered a root cause of the Unit 1 turbine trip which occurred on December 14, 1989.

Significant modifications to the maintenance process have occurred since the turbine trip. Corrective actions resulting from the event included a vendor manual revision, counseling of the instrument maintenance personnel on the importance of attention to detail and discrepancy

resolution, and procedure revisions to ensure replacement parts are compared to parts removed. A final concern, that of verifying the relay state of a component prior to inserting a trip signal on the other channel, was resolved through the utilization of a Work Analyst Writer's Guide, implemented November 8, 1991. The inspectors reviewed the licensee's corrective actions, which appeared adequate to prevent recurrence. This item is considered closed.

No violations or deviations were identified.

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

The following licensee event reports were reviewed to ensure that reportability requirements were met, and that corrective actions, both immediate and to prevent recurrence, were accomplished in accordance with the technical specifications:

- a. (Closed) LER 254/90021-LL: Residual Heat Removal Valve 1001-50 failed to open due to thermal binding.
- b. (Closed) LER 254/91008-LL: Reactor building ventilation isolation due to lightning strike.
- c. (Closed) LER 254/91011-LL: Failure of secondary containment due to air inleakage.
- d. (Closed) LER 254/91015-LL: Unit 1 cable tunnel flow switch OOS for greater than 14 days.
- e. (Closed) LER 254/91016-LL: Lines 2-1604-18" and line 1-1606-18" support imbedment plate outside design basis due to preservice error involving contractor and engineering personnel.
- f. (Closed) LER 254/91017-LL: "B" train of CR HVAC emergency air filtration unit unable to attain proper delta T and proper delta P across filter train due to equipment failure and inappropriate heater performance criteria.
- g. (Closed) LER 254/91022-LL: "B" train CR HVAC emergency filtration unit unable to attain proper delta T across heater due to excessively conservative delta T requirements.
- h. (Closed) LER 254/91026-LL: Breach of secondary containment--1A and 2A drywell to torus purge fan dampers.
- i. (Closed) cR 254/91027-LL: Unit 1 shutdown due to water leaking onto bus 14-1.
- j. (Closed) LER 254/90003-LL: Exceeding technical specification leakage limit for containment isolation valves and penetrations due to excessive leakage from HPCI steam exhaust check valve.

- k. (Closed) LER 254/91009-LL: Failure of the core spray room drain check valves due to foreign material becoming lodged in check valves.
- l. (Closed) LER 265/90014-LL: Torus level sight glass left valved in due to personnel error causing a containment integrity violation.
- m. (Closed) LER 265/91004-LL: Both units SBLC declared inoperable due to inadequate testing and calculation of pump NPSH.
- n. (Closed) LER 265/91007-LL: Reactor water low level scram due to 2B feedwater regulating valve failing to full close.
- o. (Closed) LER 265/91011-LL: Unit 2 HPCI declared inoperable due to failure of gland seal hotwell pump caused by condenser high level switch failure.
- p. (Closed) LER 265/91013-LL: Entering EGC without performing required surveillance due to personnel error.
- q. (Closed) LER 265/91014-LL: 2A RHR heat exchanger support beams found to be outside design basis during lifting rig evaluation due to notches in the flange area.

In addition, recent Deviation Reports (DVRs) were reviewed in order to monitor conditions related to plant or personnel performance and to detect potential development of trends. Appropriate generation and disposition of DVRs, in accordance with the Quality Assurance Manual, was also reviewed.

No violations or deviations were identified.

#### 4. Refueling Activities (60710)

The Unit 2 refuel outage commenced on January 2, 1992, and is tentatively scheduled to be completed on May 7, 1992. Major activities this inspection period have been the shroud access cover repair, RHR logic testing, control rod drive (CRD) friction testing, core refuel, reactor vessel reassembly, and preparation of the reactor vessel and class 1 systems for the 10 year hydrostatic test.

The inspectors observed portions of the steam separator and steam dryer installations and reviewed the verification process used to confirm proper installation of the steam separator hold down bolts. Overall ALARA and maintenance practices during these evolutions appeared adequate.

#### Shroud Access Cover Repair

Repairs to the shroud access cover continued during this inspection period, and were completed on March 8, 1992. The inspectors did not identify any problems during the repairs.

### Low Reactor Head Bottom Temperature

While performing the Unit 2 reactor vessel hydrostatic test, the Technical Specification (TS) low temperature limit for reactor vessel non-beltline temperature was exceeded. This occurred on March 29, 1992, and is under review by the resident staff. Preliminary results indicate the cause to be personnel error relating to a failure to compare the actual non-beltline temperature to the TS requirement. This issue is considered unresolved pending further review (265/92008-01 (DRP)).

### 5. Operational Safety Verification (71707)

Throughout the inspection period, the inspectors verified that the facility was run in conformance with the license and regulatory requirements, and that the licensee's management control system was implementing its responsibilities for safe operation.

The inspectors observed control room activities to ensure proper control room staffing, shift turnover coordination, plant activities coordination, adherence to procedures and technical specifications, operator cognizance of plant parameters and alarms, and electrical power configuration. The frequency of plant and control room visits by station management was also reviewed.

During tours of accessible areas of the plant, the inspectors noted general plant and equipment conditions. One item of interest was observed on March 27, 1992, when an inspector entered the reactor building via the 1/2 diesel generator (DG) airlock. When the reactor building door was actuated, both the reactor building door and the 1/2 DG doors opened. Having both doors open simultaneously resulted in a breach of secondary containment. The inspector promptly pushed the DG door shut. The latch on the 1/2 DG door was defective and the differential pressure across the door opened it. The inspector noted that a work request had already been written to correct the defective latch. In addition, a caution sign concerning simultaneous opening of both doors was in error. The inspector informed the shift engineer of the door and caution sign problem. The caution sign was corrected, and repairs to the latch are in progress.

Additional items monitored included a review pertaining to control of activities in progress (maintenance and surveillance) and observation of shift turnovers, radiation protection and general safety items. The specific areas observed were:

#### a. Engineered Safety Features (ESF) Systems

Accessible portions of engineered safety features (ESF) systems were specifically inspected to verify proper valve and electrical alignments and proper essential support system operability. Components were inspected for leakage, proper lubrication, abnormal corrosion and cooling water supply availability. Associated tagouts and jumper records were also reviewed.

b. Radiation Protection Controls

The inspectors verified that workers were following required health physics procedures for personnel monitoring, personnel protection and frisking. The inspectors verified that radiation posting requirements were followed and randomly examined radiation protection instrumentation for use, operability, and calibration.

c. Security

The inspectors verified, by sampling, that persons in the protected area (PA) displayed proper badges and had escorts if required. The inspectors also verified that vital areas were kept locked and alarmed, or guards were posted if required, and that personnel and packages entering the PA were properly searched or monitored.

d. Housekeeping and Plant Cleanliness

The inspectors monitored the status of housekeeping and plant cleanliness for fire protection requirement adherence, and protection of safety related equipment from intrusion of foreign matter.

In addition to the above areas, the inspectors reviewed various records for completeness and accuracy. These records included tagouts, jumper logs, 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 (C2703)

Station maintenance activities were observed to verify that they were conducted in accordance with approved procedures and work packages, regulatory or industry guidance, and in conformance with technical specifications limiting conditions for operations.

The inspectors verified that approvals were obtained prior to work initiation, that quality control inspections occurred, that appropriate post-maintenance functional tests or calibrations were performed, that maintenance personnel were qualified, that parts and materials used were properly certified; and that proper radiological and fire prevention controls were implemented. The status of outstanding jobs was also reviewed to ensure that appropriate priority was assigned to maintenance of safety-related equipment which could affect system performance.

The following maintenance activities were observed and reviewed:

Unit 1/2

- Essential Service Uninterruptible Power Supply Inverter Preventive Maintenance
- Emergency Diesel Generator Pre-Lube Modification
- Diesel Generator Rotor Pole Bolts Torque Inspection

Unit 2

- Diesel Generator Rotor Pole Bolts Torque Inspection
- CRD Accumulator 54-39 Scram Inlet Valve Repair
- Control Rod Drive 14-07 Removal From Vessel
- Control Rod Drive D-2 Repair
- Special Test 2-106, "Diesel Generator Cooling Water Pump Speed Versus Torque Curve Calculation"

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.

No violations or deviations were identified.

7. Monthly Surveillance Observation (61726)

The inspectors observed required surveillance testing and verified procedural adherence, test equipment calibration, technical specification action statement adherence, and proper removal and restoration of affected components. The inspectors reviewed completed surveillance packages to ensure that results conformed with technical specification and procedure requirements, that there was independent verification of the results, that proper signoffs occurred, and that any test deficiencies were appropriately dispositioned.

The inspectors also witnessed portions of the following test activities:

Unit 1/2

- QOS 6600-1 Emergency Diesel Generator Monthly Load Test

Unit 1

- QIS 60-0 Power Operation Functional Test
- QOS 250-4 Main Steam Isolation Valve Closure Timing
- QOS 6600-1 Emergency Diesel Generator Monthly Load Test

Unit 2

- QIP 1600-S4 Strongest Rod Out Subcriticality Test
- QIS 41-1 Prior To Startup Instrument Functional Test



- Residual Heat Removal System Logic Test
- Control Rod Drive Friction Testing
- Reactor Vessel Hydrostatic Test

No violations or deviations were identified.

8. Safety Assessment and Quality Verification (40500)

During the inspection period, the inspectors held discussions with licensee management in the Nuclear Quality Programs (NQP), Onsite Nuclear Safety Group (ONSG), and corporate Quality Assessment (QA) groups. Discussions focused on each department's function and its involvement in the assessment of safety and quality verification of previous and future plant activities. Licensee event reports (LERs) and monthly reports were also reviewed.

The NQP group monitors field activities of various station work groups and prepares a monthly Field Monitoring Report for the station manager. Highlighted in the report are activities considered deficient, marginally acceptable, or indicating exceptional performance. Potential problems are identified as Corrective Action Reports and are categorized as to the significance of the issue. The ONSG also prepares a monthly report for the site. One of the ONSG's functions is to be a resource available to the plant manager to investigate concerns that may exist. The ONSG also reviews activities based on their own initiative in addition to safety issues that are of interest to other organizations. Examples of significant issues reviewed by the ONSG included evaluations before and during the refuel outage of activities concerning shutdown risk and the shroud access cover repairs.

Adequate review of safety issues by the corporate QA group was verified through discussions with QA personnel concerning their function as it relates to the offsite review committee.

As a result of discussions with licensee and review of their documents, the inspectors' concerns were inadequate 10 CFR 50.59 safety evaluations, as exemplified by a previous violation in this area, and safety assessment of engineering reviews. The electrical distribution system functional inspection (EDSFI), in April 1991, and the service water inspection (SWI), in March 1992, both identified examples of inadequate equipment engineering assessments. Examples of the SWI concerns included the effect of clogged RHR room cooler heat exchangers on RHR system operability, problems with flow calculations supporting service water, diesel generator cooling water system capabilities, concerns with contractor oversight and previously identified technical staff inexperience. The results of the NRC staff evaluation of the EDSFI was discussed in inspection report 91011/91007, and those relative to the SWI will be documented in the SWI report (91201).

Overall, the licensee's safety assessment and quality verification groups are viewed as being effective in performing their intended

functions. Except for concerns with the engineering assessments, no overall significant issues were identified.

9. Training Effectiveness (41400, 41701)

The effectiveness of training programs for licensed and nonlicensed personnel was evaluated by the inspectors through observation of surveillance, maintenance, and operations activities. In general, activities observed indicated an effective training program.

No violations or deviations were identified.

10. Report Review

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

The inspectors also reviewed the licensee's Monthly Trend and Analysis Report for February 1992.

No violations or deviations were identified.

11. Events (93702)

Unit 2 Residual Heat Removal (RHR) System Inoperable

On March 4, 1992, in response to Generic Letter 89-13, inspection of the Unit 2 RHR pump room cooler heat exchangers indicated significant blockage of the tubes beyond the design margin. A 50.72 notification for loss of both trains of RHR was made. Prior to this, the room cooler heat exchangers for the Unit 1 systems were found clogged. Following the 50.72 notification on Unit 2, the licensee reviewed the Unit 1 results, and a 50.72 notification was made on March 11, 1992, on the Unit 1 loss of both trains of RHR. A licensee analysis concluded that the room coolers were not required for RHR system operation. The analysis is currently being reviewed by NRC to verify its validity. The analysis results will then be used to determine the significance of the cooler tube blockage relative to RHR system operability. This item is considered unresolved pending the above evaluations (254/92008-02(DRP)); (265/92008-02(DRP)).

Control Rod Drive (CRD) Maintenance Activity

On March 11, 1992, while removing a control rod drive (CRD) from the reactor vessel, a problem was encountered with uncoupling the CRD from the control rod. Because of the existence of an unisolable leak, the plant manager informed NRC Region III of the situation. The affected unit was in a refuel outage with no fuel in the vessel. The CRD was later reinserted to stop the leakage. For CRD removal, 5 to 10 gallons per minute of leakage is normal. The event significance was that, due

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to the uncoupling problem, the activity took longer than normal and therefore allowed more total leakage than normally encountered. Also, the potential existed for pushing the control rod up while inserting the drive, which could have resulted in a greater amount of leakage. The inspectors reviewed the licensee actions for this event and have no further concerns.

No violations or deviations were identified; however one unresolved item was identified and is discussed in this section.

12. Meetings and Other Activities (30702)

On March 24 and 25, 1992, Brent Clayton, Chief, Branch 1 DRP, visited the Quad Cities station. A meeting was held to discuss the licensee's 1992 Management Plan during this time.

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. Two unresolved items disclosed during this inspection are discussed in sections 4 and 11.

14. 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 March 30, 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.