U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-254/89020(DRP); 50-265/89020(DRP)

Docket Nos. 50-254; 50-265 Licenses No. DPR-29; DPR-30

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Quad Cities Nuclear Power Station, Units 1 and 2

Inspection At: Quad Cities Site, Cordova, Illinois

Inspection Conducted: August 20 through September 23, 1989

Inspectors: R. L. Higgins
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Approved By: R. M. Lerch, Acting Chief
Reactor Projects Section 1B

10.6.89
Date

Inspection Summary

Inspection on August 20 through September 23, 1989 (Reports No. 50-254/89020 (DRP); 50-265/89020(DRP))

Areas Inspected: Routine, unannounced safety inspection by the resident and regional inspectors of licensee actions on previous items, plant operations, radiological controls, maintenance/surveillance, emergency preparedness, security, engineering/technical support and safety assessment/quality verification.

Results: The licensee demonstrated adequate responsiveness and safety concern, despite the identification of one unresolved item (refer to Paragraph 3.d.(4) of this report) and two isolated instances of lax adherence to procedures (refer to Paragraphs 4 and 5.a of this report). One violation of technical specifications was identified (Paragraph 5.b(1)), but because it met all of the tests of 10 CFR 2, Appendix C, Section V.G.1, no Notice of Violation was issued.

DETAILS

1. Personnel Contacted

*R. Bax, Station Manager
*G. Spedl, Production Superintendent
*R. Robey, Technical Superintendent
*R. Hopkins, Quality Assurance
*T. Barber, Regulatory Assurance

*Denotes those present at the exit interview on September 22, 1989.

The inspectors also contacted and interviewed other licensee and contractor personnel during the course of this inspection.

2. Action on Previous Items (92702)

TMI Action Plan Item II.F.2.4, Reactor Reference Leg Overheating and Mechanical Level Indicator (Generic Letter 84-23)

The reactor reference leg reroute modification is currently scheduled for the eleventh refueling outage at both units. The eleventh refueling outage for Unit 1 and Unit 2 is currently scheduled for October 1990 and June 1991, respectively.

3. Plant Operations

a. Operational Safety Verification (71707)

The inspectors, through direct observation, discussions with licensee personnel, and review of applicable records and logs, examined plant operations. The inspectors verified that all activities were accomplished in a timely manner using approved procedures and drawings and were inspected/reviewed as applicable; and that procedures, procedure revisions and routine reports were in accordance with Technical Specifications, regulatory guides, and industry codes or standards. Additionally, the inspectors verified that approvals were obtained prior to initiating any work; activities were accomplished by qualified personnel; the limiting conditions for operation were met during normal operation and while components or systems were removed from service; functional testing and/or calibrations were performed prior to returning components or systems to service; and independent verification of equipment lineup and review of test results were accomplished. Also verified were quality control records for being properly maintained and reviewed, and parts, materials and equipment for proper certification, calibration, storage, and maintenance as applicable. The inspectors conducted frequent tours of plant facilities to observe any of adverse plant conditions such as equipment malfunctions, potential fire hazards, radiological hazards, fluid leaks, excessive vibrations, and personnel errors. The inspectors' review ensured that any such issues were addressed

in a timely manner with sufficient and proper corrective actions and reviewed by appropriate management personnel. No violations or deviations were noted.

b. Engineered Safety Features System Walkdown (71710)

During plant tours of Units 1 and 2, the inspectors walked down some of the accessible portions of the High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), Core Spray (CS), Residual Heat Removal (RHR), RHR Service Water, Standby Liquid Control (SLC) Systems, and Standby Gas Treatment (SGT) Systems. The inspectors also walked down the Emergency Diesel Generators (EDG) and the Station Batteries. No violations or deviations were noted.

c. Summary of Operations

Unit 1

Unit 1 operated normally at the maximum power which fuel depletion would sustain (coastdown), or at reduced power in order to perform surveillance testing or respond to load dispatcher orders, until a rapid power reduction to less than 40% power was made and an Unusual Event declared on August 25, 1989, when the licensee determined that the main turbine control valve fast acting solenoids were deenergized (refer to Paragraph 3.d.(2) of this report). The fast acting solenoids were reenergized and normal power operation resumed on August 25, 1989. The unit operated normally until August 29, 1989, when a loss of main condenser vacuum necessitated that the unit rapidly reduce power and disconnect the main generator from the electrical grid while maintaining the reactor critical (refer to Paragraph 3.d.(3) of this report). The cause of the loss of main condenser vacuum was repaired and normal power operation resumed on August 30, 1989. The unit then operated normally until it was shutdown on September 10, 1989, to begin a scheduled ten week long refueling and maintenance outage.

Unit 2

Unit 2 operated normally at full power, on EGC, or at reduced power in order to perform surveillance testing or respond to load dispatcher orders, until the unit shutdown on August 25, 1989, in order to perform maintenance in the drywell. The unit restarted on August 31, 1989, and resumed normal power operations on September 1, 1989 (refer to Paragraph 3.d (1) of this report). The unit operated normally at power throughout the rest of the inspection period.

d. Onsite Followup of Events at Operating Power Reactors (93702)

(1) Unit 2 Maintenance Outage

At 1:27 a.m. CDT on August 25, 1989, Unit 2 shutdown in order to replace the 2A reactor recirculation pump seal, plug leaking main condenser tubes, repair the 2F drywell cooler, and repair leaks on feedwater and HPCI piping. All planned maintenance was completed and the licensee was preparing to restart the unit on August 27, 1989, when a severe leak developed in the Unit 2B RHR service water discharge piping. This necessitated a modification in which a blank flange was inserted to plug the Unit 2B RHR service water discharge piping, and the Unit 1B RHR service water discharge piping was cross-connected to supply the Unit 2B RHR heat exchanger. A Technical Specification amendment was issued to allow this alignment until replacement piping (which was being installed) is completed.

The reactor was restarted on August 31, 1989, and the unit returned to normal power operation on September 1, 1989.

(2) Unit 1 Unusual Event

On August 23, 1989, with Unit 1 at approximately 80% power in coast down, the reactor operator discovered that the four control valve test permissive lights on the turbine control console in the control room were burned out. A work request was written and an investigation was begun to determine the cause of the burned out light bulbs and correct it.

On August 25, 1989, with Unit 1 again at 80% power, the licensee determined that the cause of the burned out light bulbs was a burned out wire. This burned out wire caused a fuse to blow, de-energizing the light bulbs and also de-energizing the main turbine control valve fast acting solenoids. Since the fast acting solenoids are required by Technical Specification Table 3.1-3 when the reactor is above 45% power, the licensee declared an Unusual Event and immediately began a Technical Specification required power reduction. Unit 1 power was reduced below 45% and the Unusual Event was terminated.

The licensee determined the cause of the burned out wire to be a short in the test permissive indicating light for the No. 2 turbine control valve. The licensee installed a jumper around the short, replaced the burned out wire and the blown fuse, and then resumed normal coast down operation on August 25, 1989. During the refuel outage which began on September 10, 1989, the licensee will repair the short in the No. 2 turbine control valve test permissive indicating light and institute any other necessary repairs.

(3) Unit 1 Loss of Vacuum

On August 29, 1989, with Unit 1 at 80% power and in coast down, main condenser vacuum began to decrease. An immediate power reduction was begun in an attempt to maintain vacuum and avoid a reactor scram. Vacuum began to stabilize, the unit mode switch was placed in startup/hot standby, and the main generator was disconnected from the electrical grid. The vacuum then began to improve, the mode switch was returned to the "Run" position, and the main generator was reconnected to the electrical grid.

Investigation by the licensee determined that the cause for the loss of vacuum was a deteriorated patch on the bellows of the No. 4 control intercept valve. The patch was repaired and air leakage into the main condenser decreased significantly. On August 30, 1989, the licensee increased power to the maximum attainable in the coastdown condition and resumed normal power operation.

(4) Unit 1 New Fuel Bundle Tips Over

On September 21, 1989, with the Quad Cities Unit 1 reactor defueled in the midst of a refueling outage, a new fuel bundle was being inserted into a cell in the fuel pool. The bundle was lowered into the cell, but the fuel handling tool would not release. The bundle was raised and was in the process of being rotated 90 degrees and reinserted into the cell when the fuel handling tool released, allowing the new fuel bundle to tip over on its side onto the tops of approximately 30 adjacent irradiated fuel bundles. The licensee uprighted the new fuel bundle, placed it into the nearest cell, and suspended further fuel movement until completion of an investigation of the incident. Radiological samples, including sampling of the fuel pool water, and visual inspection of the potentially affected irradiated fuel and the fallen new fuel bundle, showed no evidence of any damage. The licensee intends to sip the affected irradiated fuel bundles prior to returning them to the reactor, and will send the fallen new fuel bundle back to the vendor for reexamination.

The licensee will conduct an investigation of the incident, and will not resume fuel movement until the cause of the dropped fuel bundle is known and corrected. This event will be tracked as an Unresolved Item (No. 254/89020-01) pending completion and NRC review of the incident investigation.

4. Radiological Controls (71707)

Observations by the inspectors indicated that the licensee's performance in the area of radiological controls was good. Licensee management attention to ALARA appears to be partially responsible for personnel exposure and contaminations being lower than anticipated. During the course of routine inspection of the Radwaste facilities a resident inspector questioned the conditions of Very High Radiation Areas which are not routinely surveyed, and are normally inaccessible. The licensee was very responsive in complying with the inspector and his concerns, as evidenced by a prompt survey of the areas confirming the absence of any unknown radiological hazards. The inspectors noted inadequate Radiation Control procedures being used that allowed a Continuous Air Monitor (CAM) to be turned off for a period of about two hours during reactor head disassembly. The licensee took prompt corrective action. The inspectors will monitor the effectiveness of the corrective action during upcoming reactor head assembly activities.

5. Maintenance/Surveillance

a. Monthly Maintenance Observation (62703)

Station maintenance activities of safety-related and nonsafety-related systems and components listed below were observed/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 service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable. Additional items reviewed included verification that 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. Also, the inspectors verified that parts and materials used were properly certified; radiological controls were implemented; and fire prevention procedures were followed. Work requests were reviewed to determine the status of outstanding jobs and to assure that priority is assigned to the maintenance of safety related equipment which may affect system performance.

The inspectors observed maintenance personnel laxness in following tool logging procedures on the backshifts during reactor disassembly. Licensee management was made aware of the observation. Licensee's corrective actions were prompt and adequate. They included reminding personnel of strict procedure adherence requirements, especially on backshifts during periods of reduced supervision.

Portions of the following activities were observed/reviewed:

(1) Unit 2 feedwater discharge line weld repair

(2) Asbestos removal

(3) Painting of the Unit 1 torus interior

(4) Unit 1 reactor water cleanup decontamination

(5) Unit 1 main turbine refurbishment

(6) Unit 1 drywell mirror insulation cleaning

(7) Unit 1 reactor recirculation system decontamination

(8) Unit 1 drywell head removal

(9) Unit 1 vessel head detensioning

(10) Unit 1 vessel head removal

(11) Unit 1 steam dryer removal

(12) Unit 1 main generator disassembly and inspection

(13) Unit 2 2A reactor recirculation pump seal replacement

No violations or deviations were noted

b. Monthly Surveillance Observation (61726)

The inspectors observed surveillance testing required by the Technical Specification and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, and that limiting conditions for operation were met. Additionally, the inspectors observed/verified the removal and restoration of the affected components, and that test results conformed with Technical Specifications and procedure requirements. Also, the inspectors verified that the results were reviewed by personnel other than the individual directing the test and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

(1) Missed Surveillances Required When the Main Chimney Sample Alarm is Out of Service

At 8:00 a.m. on August 21, 1989, Unit 1 was operating at 80% power. The 912-5 annunciator panel was taken out of service for modification-related work. At 12:47 p.m. it was determined

that the stack gas low flow alarm required by Technical Specifications was inoperable, and the flow rate estimation surveillance required to be performed every four hours was overdue. The surveillance was promptly performed. The surveillances continued to be successfully performed until it was discovered, when performing the flow rate estimation surveillance at 1:00 p.m on August 28, 1989, that the surveillance which was due at 9:00 a.m. that day had been missed. These two missed surveillances constitute a violation of Technical Specification 3.2.H. (No. 254/89020-02(DRP)).

The licensee took the following corrective actions to prevent recurrence of the two missed surveillances:

- Temporary Procedure No. 5817, 912-5 Panel Annunciator OOS, was written and placed into effect to provide an alternate means of monitoring for the OOS alarms.

- Use of a shift turnover sheet was made mandatory for the chemistry technicians.

This violation was identified by the licensee and meets the tests of 10 CFR 2, Appendix C, Section V.G.1. Consequently, no Notice of Violation will be issued and this matter is considered closed.

(2) Unit 1 Containment Isolation Valves' Leakage Rate Exceeds Technical Specification Limits

On September 10, 1989, with Unit 1 in cold shutdown beginning a refueling outage, the licensee initiated a Local Leak Rate Test (LLRT) on the torus/drywell purge volume. Included in the leakage test boundary were valves 1601-23 (Drywell Main Exhaust Valve), 1601-62 (Drywell Main Exhaust Bypass valve), 1601-60 (Suppression Chamber Main Exhaust Valve), 1601-61 (Suppression Chamber Main Exhaust Bypass Valve, 1601-63 (Primary Containment Exhaust Valve to Standby Gas Treatment System), and 1601-24 (Main Primary Containment Exhaust Valve). The leakage rate exceeded the Technical Specification Limit allowed for the total of all LLRTs. The licensee intends to repair the leaking valves and retest them prior to restarting the reactor.

(3) Unit 1 Main Steam Isolation Valve Leakage Exceeds Technical Specification Limits

On September 11, 1989, with Unit 1 in cold shutdown for a refueling outage, two of the outboard Main Steam Isolation Valves (AO-1-203-2A and AO-1-203-2D) failed their Local Leak Rate Tests. The Technical Specification limit is 11.5 standard cubic feet per hour (SCFH) or less; the leakage rate for the "A" valve was 16.12 SCFH and the leakage rate for the "D" valve was 24.19 SCFH. The licensee intends to repair the valves and repeat the tests prior to restarting the reactor.

(4) Portions of the following activities were observed/reviewed:

(a) Unit 1 Source Range Monitor Response Checks

(b) Automatic TIP Ball Valves and TIP Purge Line Local Leak Rate Test

(c) Drywell Personnel Interlock Leak Rate Test

(d) Feedwater Check Valves Local Leak Rate Test

(e) The Drywell Entry Radiation Protection Check Point

(f) MSIV Leak Rate Test

(g) RCIC Monthly and Quarterly Test

(h) MSIV Closure Test (Monthly)

(i) Manual Operation of Electromatic Relief Valves

(j) Secondary Containment Integrated Leak Test

(k) Unit 1 Monthly RHR/LPCI surveillance

(l) Unit 1 RCIC Turbine Overspeed Trip Test

(m) Unit 2 Control Rod Scram Timing

(n) Unit 2 Pre-Startup Rod Worth Minimizer System Check

(o) Unit 2 Pre-Startup Source Range and Intermediate Range Monitor Response Checks

(p) Review of Master Outage, Master Startup, and Normal Startup Checklists

6. Emergency Preparedness (71707)

During the inspection period the inspectors inspected the Quad Cities Technical Support Center (TSC) and checked the station's Emergency Plan for accuracy.

No violations or deviations were noted.

7. Security (71707)

During the inspection period the inspectors toured the plant and the Central Alarm Station to assure that security programs were being properly implemented. The inspectors verified that security barriers were in place, security doors were operable, the security force was alert, personnel correctly displayed their identification badges and visitor access was being properly controlled. No violations or deviations were noted.

a. Regulatory Effectiveness Review Preparation

The inspectors monitored the licensee's use of contractor personnel to assess the adequacy of protected area and vital area security in preparation for the Regulatory Effectiveness Review.

b. Fitness for Duty

The Resident Inspectors attended "Intervention Theatre", an on-site production which graphically portrayed substance abusers and the circumstances which contributed to the substance abuse. It assisted the licensee's employees to recognize substance abuse behavior in themselves, their families and co-workers.

8. Engineering/Technical Support

a. Installation and Testing of Modifications (37828)

The feedwater hydrogen addition modification for Unit 1 could not be completed before the outage. The feedwater hydrogen addition modification for Unit 2 has been given higher priority. Testing for Unit 2 is continuing, with completion anticipated by October 6, 1989. After Unit 2 is complete, work will recommence on Unit 1.

The Unit 2B RHR service water modification progressed and is currently scheduled for completion by September 30, 1989. All piping and supports have been installed except for the final downstream connection. As of the end of the inspection period the 1B RHR service water system was reconfigured to supply both the 1B and 2B RHR heat exchangers.

9. Safety Assessment/Quality Verification

a. Evaluation of Licensee Quality Assurance Program Implementation (35502)

During the inspection period the Senior Resident Inspector observed quality control and quality assurance personnel inspecting the welding of the blank flange for the 2B RHR service water pump discharge piping modification.

The Resident Inspector attended the exit meeting for the Radiation Protection Audit, in which several deficiencies were brought to the attention of plant management. Commitment time frames for corrective actions were readily negotiated between the Quality Assurance staff and plant management, which appeared adequately responsive.

b. In-Office Review of Written Reports of Nonroutine Events at Power Reactor Facilities (90712) and Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities) (92700)

During the inspection period the resident inspectors reviewed incidents such as scrams, ESF actuations and component failures which occurred at other plants. The resident inspectors informed the licensee of the details of all events which potentially had applicability to components or activities at Quad Cities.

LER Review

(1) (Closed) LER 254/89010 Revision 01: Reactor Scram Due to a Loose Wire on the Condenser Low Vacuum Pressure Switch Indicating Light.

This revision corrects an administrative error in the original LER which was closed in report No. 254/89016; No. 265/89016. This revision makes no substantive changes in the original LER. This LER revision is considered closed.

(2) (Closed) LER 265/89004, Revision 00: Inability of ACAD on Unit 2 to Perform with Loss of Unit 2 Diesel Generator.

This is a voluntary LER. Since the Atmospheric Containment Atmosphere Dilution system is not required by Technical Specifications and is not part of the design basis, this event will not be formally tracked by the NRC. This item is considered closed.

(3) (Closed) LER 254/89013, Revision 00: Missed Two Four-Hour Surveillances With Main Chimney Sample Pump Alarm Out of Service.

This event is described in paragraph 5.b.(1) of this report. All short term corrective actions have been completed, and the long term corrective action is being tracked by the licensee's Nuclear Tracking System. This item is considered closed.

(4) (Closed) LER 265/88007, Revision 01: Leak Rate from All Valves and Penetrations in Excess of Technical Specification Limits.

This revision documents corrective actions taken to repair and successfully retest leaking primary containment isolation valves which failed LLRT conducted in April 1988. This item is considered closed.

c. Evaluation of Licensee Performance (35502)

A review ofsite operations for the second quarter of 1989 was conducted to evaluate the performance of the licensee as it may require adjustment of the NRC inspection plan. The review included operational events and trends indicated by monthly status reports.

No violations or deviations were identified.

d. Evaluation of Licensee Self-Assessment Capability (40500)

During the inspection period a Resident Inspector attended several On-Site Review Committee meetings. Relevant issues addressed included a Sodium Hypochlorite spill and missed Technical Specification surveillances (refer to Paragraph 5.b.(1) of this report). In each occasion the committee was properly staffed, adequately addressed the relevant issues, and demonstrated adequate concern for reactor safety.

e. Information Meetings with Local Officials (94600)

On August 24, 1989, the Resident Inspectors toured the Quad Cities public document room located in Dixon, Illinois. The facility appeared to be well-maintained and adequate.

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

The NRC uses the Notice of Violation as a standard method for formalizing the existence of a violation of a legally binding requirement. However, because the NRC wants to encourage and support licensees' 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.G. 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 was reported to the NRC, if required; (4) the violation will be corrected, including mesures to prevent recurrence, within a reasonable time period; and (5) it was not a violation that could reasonably be expected to have been prevented by the licensee's corrective action for a previous violation.

Violations of regulatory requirements identified during the inspection for which a Notice of Violation will not be issued are discussed in Paragraph 5.b.(1).

11 Management Meetings - Entrance and Exit Interviews (30703)

The inspectors met with licensee representatives (denoted in Paragraph 1) throughout the inspection period and at the conclusion of the inspection on September 22, 1989, and summarized the scope and findings of the inspection activities.

The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.