

## NOTICE OF VIOLATION

Commonwealth Edison Company  
Quad Cities Nuclear Power Station  
Unit 2

Docket No. 50-265  
License No. DPR-30  
EA 88-217

During an NRC inspection conducted on June 5 through August 6, 1988, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1988), the violation is listed below:

Technical Specification (TS) 3.5.A.3 requires that the LPCI mode of the RHR system be operable whenever irradiated fuel is in the reactor vessel and prior to reactor startup from a cold shutdown condition. From and after the date the LPCI mode of the RHR system is made or found to be inoperable for any reason, TS 3.5.A.5 permits continued reactor operation only during the succeeding seven days (provided other related equipment designated in TS 3.5.A.5 is operable). If the requirements of TS 3.5.A.5 cannot be met, TS 3.5.A.6 requires an orderly shutdown to be initiated and the reactor to be in the cold shutdown condition within 24 hours.

Contrary to the above, as a result of a motor control center's (MCC 28/29-5) inability to provide automatic transfer for certain situations (large break LOCA concurrent with LOOP and failure of the Unit 2 Diesel Generator), the LPCI mode of the RHR system was inoperable from October 1971 (the time when irradiated fuel was in the Unit 1 reactor) to June 22, 1988 (the time when the MCC's wiring problem was discovered). During this period the reactor was operating without complying with the ACTION requirements as described in TS 3.5.A.5 and TS 3.5.A.6.

This is a Severity Level III violation (Supplement I).

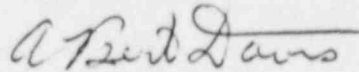
Pursuant to the provisions of 10 CFR 2.201, Commonwealth Edison Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington D.C. 20555, with a copy to the Regional Administrator, Region III, U.S. Nuclear Regulatory Commission, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, and a copy to the NRC Resident Inspector of the date of the letter transmitting this Notice. This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation if admitted; (2) the corrective actions that have been taken and the results achieved; (3) the corrective actions that will be taken to avoid further violations; and (4) the date when full compliance will be achieved.

8810250197 881021  
PDR ADOCK 05000254  
G PNU

OCT 21 1988

Where good cause is shown, consideration will be given to extending the response time. If an adequate reply is not received within the time specified in this Notice, an Order may be issued to show cause why the license should not be modified, suspended, or revoked or why such other action as may be proper should not be taken.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Bert Davis  
Regional Administrator

Dated at Glen Ellyn, Illinois  
This 21<sup>st</sup> day of October 1988

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-254/88015(DRP); 50-265/88015(DRP)

Docket Nos. 50-254, 50-265

Licenses No. DPR-29; DPR-30

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

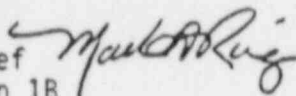
Facility Name: Quad Cities Nuclear Power Station, Units 1 and 2

Inspection At: Quad Cities Site, Cordova, IL

Inspection Conducted: June 5 through August 6, 1988

Inspectors: R. L. Higgins  
A. D. Morrongiello

Approved By: M. A. Ring, Chief  
Projects Section 1B



8/23/88  
Date

Inspection Summary

Inspection on June 5 through August 6, 1988 (Reports No. 254/88015(DRP); 50-265/88015(DRP))

Areas Inspected: Routine, unannounced resident inspection of Operations, Maintenance, Surveillance, LER Review, Routine Reports, Temporary Instructions, Administrative Controls Affecting Quality, Radiation Control, Outages, Information Notices, Generic Letters and the Local Public Document Room.

Results: In the areas inspected, one violation (Failure to properly control procedure changes - Paragraph 8) and one apparent violation (Failure of MCC 28/29-5 auto transfer capability - Paragraph 10(h)) were identified. The inability of MCC 28/29-5 to auto transfer is believed to have existed since initial construction and is considered a potentially serious issue for which an enforcement conference is planned on August 26, 1988. However, during this inspection improvements in the licensee's process for performing and testing modifications were noted and it was this improved testing which detected the inability to auto transfer. In addition, unresolved items in the areas of environmental qualification of post accident drywell temperature monitors (Paragraph 10(e)), excessive work hours for licensed personnel (Paragraph 2(h)), an inadequate review of the consequences of fuse removal (Paragraph 10(c)), improper valve operation while returning water level instrumentation to service (Paragraph 10(f)), and an improper routing of a braided wire in the 1/2 diesel generator auto start circuitry were identified.

88-0829-0302 15pp

46686 316

## DETAILS

### 1. Personnel Contacted

- \*R. Bax, Station Manager
- \*R. Walsh, Regulatory Assurance
- \*A. Scott, Quality Assurance

\*Denotes those present at the exit interview on August 8, 1988.

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

### 2. Operations (71707, 93702)

The inspectors, through direct observation, discussions with licensee personnel, and review of applicable records and logs, examined plant operations. The inspectors verified that activities were accomplished in a timely manner using approved procedures and drawings and were inspected/reviewed as applicable; procedures, procedure revisions and routine reports were in accordance with Technical Specifications, regulatory guides, and industry codes or standards; 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; independent verification of equipment lineup and review of test results were accomplished; quality control records were properly maintained and reviewed; parts, materials and equipment were properly certified, calibrated, stored, and or maintained as applicable; and adverse plant conditions including equipment malfunctions, potential fire hazards, radiological hazards, fluid leaks, excessive vibrations, and personnel errors were addressed in a timely manner with sufficient and proper corrective actions and reviewed by appropriate management personnel.

#### a. Engineered Safety Features System Walkdown (71710)

During plant tours of Units 1 and 2, the inspectors walked down the accessible portions of the High Pressure Coolant Injection Systems, Reactor Core Isolation Cooling Systems, Core Spray Systems, Residual Heat Removal Systems, Standby Liquid Control Systems, Standby Gas Treatment Systems, Diesel Generators, and Station Batteries.

#### b. Summary of Operations

##### Unit 1

During the inspection period, the unit operated either at full power, on Economic Generation Control (EGC), or at reduced power in order to perform surveillance testing or to comply with load dispatcher orders, until June 7, 1988, when a condenser air leak

necessitated that the main generator be removed from the electrical grid. Unit 1 remained critical at less than 1% power. Repairs were made and Unit 1 was reconnected to the electrical grid on June 12, 1988.

The condenser air leak reappeared on June 13, 1988, so the unit was once again removed from the electrical grid. On June 14, 1988, the unit was placed in cold shutdown to replace post accident drywell temperature monitor splices which did not meet environmental qualification requirements. With the post accident drywell temperature monitor splices replaced and the condenser air leak repaired, the unit was restarted on June 16, 1988, and reconnected to the electrical grid on June 17, 1988.

For the remainder of the inspection period Unit 1 operated either at full power, on Economic Generation Control (EGC), or at reduced power in order to perform surveillance testing, respond to load dispatcher orders, or comply with environmental limitations on discharge temperature due to high river temperature and low river flow. As of the end of the inspection period the unit has been critical for 49 consecutive days.

#### Unit 2

At the beginning of the inspection period Unit 2 was in a refueling shutdown until June 24, 1988, at which time the unit was restarted. The main generator was reconnected to the electrical grid on June 25, 1988.

The unit operated either at full power, on EGC, or at reduced power in order to perform surveillance testing, respond to load dispatcher orders, or comply with environmental limitations on discharge temperature due to high river temperature and low river flow, until July 24, 1988, when the unit was disconnected from the electrical grid and placed in cold shutdown to repair a ground on the main generator's rotor. Unit 2 remained in cold shutdown throughout the remainder of the inspection period.

#### c. Unit 1 HPCI Inoperable

On June 10, 1988, Unit 1 was operating in the Startup Mode at 2% power. During the afternoon shift the Shift Foreman received a report of a smoke odor from the maintenance personnel in the Unit 1 HPCI room and that the Unit 1 HPCI turbine auxiliary oil pump felt hot. The Shift Foreman confirmed that the auxiliary oil pump felt hot and that smoke was still present. The auxiliary oil pump circuit breaker was tripped by the Shift Foreman at 10:50 p.m. CDT on June 10, 1988, rendering the Unit 1 HPCI system inoperable.

Electrical maintenance personnel checked the auxiliary oil pump and found it to be in satisfactory condition. The breaker for the auxiliary oil pump was shut and the auxiliary oil pump was manually operated to demonstrate operability. At 12:32 a.m. on June 11, 1988, the auxiliary oil pump was returned to service and the Unit 1 HPCI system declared operable.



The source of the smoke was never located. The cause of the hot motor casing was due to the normal operation of the motor heater which prevents moisture accumulation in the motor windings when the motor is not operating. The auxiliary oil pump for the Unit 2 HPCI turbine was checked and found to have motor casing temperatures similar to those found on the Unit 1 HPCI turbine auxiliary oil pump.

d. Unit 1 RCIC Inoperable

At 3:05 p.m. CDT on June 25, 1988, the Unit 1 reactor operator, during his panel checks, discovered the RCIC flow controller deviation meter indicating rated flow with the RCIC turbine at rest. The flow controller should indicate a downscale reading when the RCIC turbine is in this condition. Unit 1 RCIC was declared inoperable since the flow controller could not allow the RCIC turbine to accelerate to rated speed for reactor vessel injection. At the time of the discovery Unit 1 was operating near rated power and Unit 2 was conducting post reactor startup testing in preparation for connecting the Unit 2 main generator to the electrical grid.

Instrument maintenance personnel determined that the plug connector was dirty and subsequently cleaned it. The flow controller indication went to normal after the connector was cleaned. At 4:15 p.m. on June 25, 1988, operability testing on the RCIC turbine was completed satisfactorily and Unit 1 RCIC was declared operable.

The length of time during which the Unit 1 RCIC flow controller was in an inoperable condition is unknown. The Unit 2 RCIC was tested on June 25, 1988, during post startup surveillance testing and performed satisfactorily.

e. Unit 2 HPCI Isolation

At 11:55 a.m. CDT on June 26, 1988, during initial prewarming of the Unit 2 HPCI turbine prior to its quarterly flow rate surveillance, HPCI automatically isolated on high temperature. The shift foreman and operating engineer were in the HPCI room and observed wisps of steam from the seals in close proximity to the HPCI room temperature detectors. At the time of the isolation Unit 2 was at approximately 10% power conducting post startup surveillance testing.

An air mover was placed in the HPCI room to disperse steam seal weepage, the HPCI turbine was unisolated and the flow rate surveillance was satisfactorily performed.

f. Units 1 and 2 Summer Drought Operational Restrictions

Quad Cities must abide by several environmental limits imposed by the Illinois Environmental Protection Agency concerning the effect which circulating water discharging into the Mississippi River has on river temperature. These limits are: (1) the maximum

differential temperature between temperatures measured upriver and downriver from the plant is not permitted to exceed 5 degrees F; (2) the maximum downriver temperature is limited to values which vary according to the month of the year (for the months of July and August this temperature limit is 86 degrees F), and downriver temperature is prohibited from exceeding these values for more than a total of 87 hours and 36 minutes in any 12 month period; (3) the downriver temperature is prohibited from ever exceeding the monthly temperature limit by more than 3 degrees F (for the months of July and August this never-exceed temperature is 89 degrees F).

In order to ensure compliance with the environmental limits, Quad Cities measures upriver and downriver temperatures and the Mississippi River flowrate. Based upon river flow and upriver temperature the combined capacity of Quad Cities Units 1 and 2 is limited to ensure that the downriver temperature does not exceed any of the environmental limits.

As of the inspection end date, Quad Cities had exceeded its downriver temperature limit on July 1, 7, 19, 20, August 2, 3, 4 and 5, accruing a total time of 39 hours and 29 minutes in excess of its limits so far this year. Quad Cities has had to derate its units on July 1, 7, 19, 20, 29, August 1, 2, 3, 4, 5, and 6, and would have had to derate on additional days if Unit 2 had not been shutdown.

g. Unit 2 Reactor Shutdown Due to a Ground on the Rotor of the Main Generator

At 4:45 p.m. CDT on July 22, 1988, an annunciator alarm indicating a ground on the generator or exciter field was received for Unit 2. At the time both Units 1 and 2 were operating at greater than 90% power. At 1:00 a.m. on July 23, 1988, corporate Operating Analysis Division verified that the ground was valid. At 8:30 p.m. on July 23, 1988 Unit 2 began decreasing power, and at 3:50 a.m. on July 24, 1988, the Unit 2 main generator was disconnected from the electrical grid and the reactor was placed in hot standby. Investigation by the licensee revealed that the ground was dependent on the speed of the turbine, the resistance to ground decreasing as turbine speed increased. At 3:20 p.m. on July 24, 1988, the reactor was intentionally scrammed from 85 MW thermal, and placed in cold shutdown at 9:00 p.m. on July 24, 1988.

The ground was located on the through-stud lead connection on the number 2 pole and was due to insulation which was installed improperly during manufacture. Repairs are anticipated to be accomplished in time for Unit 2 to be reconnected to the electrical grid by August 15, 1988.

h. Excessive Work Hours for Licensed Personnel

One Nuclear Station Operator (licensed reactor operator) worked 48 hours in the 3 day period of June 25 - 27, 1988, and also worked 80 hours in the 7 day period of June 22 - 28, 1988. A Shift Foreman (licensed senior reactor operator) worked 32 hours during the 2 day period of July 25 and 26, 1988. These are examples of licensed personnel working in excess of the guidelines of Generic Letter 82-12, which limit plant staff who perform safety-related functions (e.g., senior reactor operators, reactor operators, auxiliary operators, health physicists, and key maintenance personnel) to a maximum of 16 hours in any 24 hour period, 24 hours in any 48 hour period, and 72 hours in any 7 day period.

This issue is being treated as an unresolved item pending further discussions with Region III and the licensee regarding the requirements of Generic Letter 82-12 (254/88015-01(DRP); 265/88015-01(DRP)).

No violations or deviations were identified, however, one unresolved item was identified and is still being reviewed.

3. Monthly Maintenance Observation (62702, 62703)

Station maintenance activities of safety related and non-safety 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; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; 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 safety related equipment maintenance which may affect system performance.

Portions of the following activities were observed/reviewed:

- a. Unit 2 HPCI auxiliary oil pump repair.
- b. Repair of electrical penetration seals in the cable spreading room.
- c. Removal of scaffolding from Unit 2.
- d. Removal of a breathing air flask from Unit 2.
- e. Repair of the cooling water line to the Unit 2 mechanical vacuum pump.



- f. Repair of the A Fire Diesel.
- g. Installation of a catwalk in the 2A RHR service water pump vault.
- h. Repair of the Unit 2 nitrogen-makeup-to-containment valve 2-1601-57.
- i. Repair of the Unit 2 diesel generator.
- j. Preventative maintenance on the Unit 2 diesel generator.
- k. Repair of the Unit 2 main generator ground.

No violations or deviations were identified.

4. Monthly Surveillance Observation (61726)

The inspectors observed Technical Specifications-required surveillance testing and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with Technical Specifications and procedure requirements and 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.

Portions of the following activities were observed/reviewed:

- a. Unit 1 condenser pit high level alarm surveillance.
- b. Unit 2 condenser pit high level alarm surveillance.
- c. Unit 2 prestartup checks.
- d. Unit 1 HPCI monthly and quarterly surveillances from the control room.
- e. Unit 2 air ejector suction valve test.
- f. Unit 2 LPCI pump operability surveillance.
- g. Unit 2 core spray pump operability surveillance.
- h. Unit 2 RHR service water pump operability surveillance.
- i. Unit 2 HPCI valve operability surveillance.
- j. Unit 2 control rod timing.
- k. Unit 2 ECCS Division I logic testing.

No violations or deviations were noted.

5. LER Review (92700)

a. Unit 1

- (1) (Closed) LER 88009, Revision 00: High Pressure Coolant Injection System Declared Inoperable When Oil Pump Motor Breaker Turned Off Due to Perceived High Temperature.

This item is discussed in paragraph 2(c) of this report.

- (2) (Open) LER 87016, Revision 01: Leak Rate From All Valves and Penetrations on Unit One in Excess of the Technical Specification limit.

This item is being followed by a region based inspector.

- (3) (Closed) LER 88011, Revision 00: RCIC system declared inoperable due to poor flow controller plug connection.

This item is discussed in paragraph 2(d) of this report.

b. Unit 2

- (1) (Open) LER 88011, Revision 00: Unit 2 Scram when the Mode Switch was Moved; Caused by Switch Position Uncertainty Due to Design

This item was discussed in Inspection Report 265/88010(DRP). This item will remain open until the new switch is installed.

- (2) (Open) LER 88006, Revision 01: Unit 2 Flued Head Anchors Don't Meet Design Requirements.

This item will be followed by a region-based inspector.

- (3) (Open) LER 88017, Revision 00: Stresses in MSIV Air Line Exceed FSAR Allowables.

This item will be followed by a region-based inspector.

- (4) (Closed) LER 88013, Revision 00: Improperly Installed SJAE Suction Valves Due to Insufficient Instruction and Testing.

This item was covered by a region-based inspector (See Inspection Report 265/88012 (DRS)).

- (5) (Open) LER 88012, Revision 00: Existing Pipe Supports on Line 2-1265-2" Do Not Meet Design Requirements Due to Improper Analysis During Modifications.

This item is being followed by a region-based inspector.

- (6) (Open) LER 88014, Revision 00: Deviation From Radioactive Waste Solidification Process Control Program.

This item is being followed by a region-based inspector.

- (7) (Closed) LER 88018, Revision 00: Reactor Water Cleanup System Valve Closure Due to a Spurious High Non-Regenerative Heat Exchanges Outlet Temperature Signal.

This item is discussed in paragraphs 10(a) and (d) of this report.

- (8) (Closed) LER 88019, Revision 00: Engineered Safety Features Actuations While Taking Valve 2-1601-56 Out-Of-Service Due to Personnel Error.

This item is discussed in paragraph 10(c) of this report.

- (9) (Closed) LER 88021, Revision 00: HPCI System Automatic Isolation During Pre-Warming Due to Design Deficiency.

This item is discussed in paragraph 2(e) of this report.

- (10) (Open) LER 88023, Revision 00: Failure of MCC 28/29-5 Main Feed Swap Over Due to Unlabeled Lead Caused by Installation Error.

This item is discussed in paragraph 10(h) of this report.

- (11) (Open) LER 88024, Revision 00: 1/2 DG Auto Start Due to a False Signal During Troubleshooting Activities Caused by an Apparent Manufacturing or Installation Error.

This item is discussed in paragraph 10(i) of this report and will remain open until corrective action is completed.

6. Review of Routine and Special Reports (90713)

The inspectors reviewed the Monthly Performance Reports for the months of May and June, 1988.

No violations or deviations were identified.

7. Temporary Instruction Followup (92701)

Temporary Instruction 2515/95, Inspection for Verification of Quality Assurance Request regarding diesel generator fuel oil Multiplant Action Item A-02.

This item was addressed in inspection report 254/87008(DRP) and 265/87008(DRP).

8. Administrative Controls Affecting Quality (42700)

Several drawings and procedures were checked for adequacy and accuracy. Errors found were brought to the attention of the licensee and are in the process of being corrected. On July 25, 1988, NRC contractor personnel discovered that Temporary Procedure Change Notice Sheets were not properly disseminated to document procedure changes which were in effect for emergency operating procedures QGA 00 and QGA 500-8. This is contrary to station procedure QAP 1100-5 and is considered to be a violation (254/88015-02(DRP); 265/88015-02(DRP)).

One violation was identified in the review of this area.

9. Radiation Control (71709)

Periodic inspections of plant radiological control conditions were made during the inspection period. Isolated instances of minor deficiencies were found and promptly corrected by plant personnel. No violations or deviations were identified.

10. Outages (86700)

Quad Cities Unit 2 was in a scheduled maintenance and refueling outage from April 10, 1988, prior to the beginning of the inspection period, until the reactor was restarted on June 24, 1988. Originally Unit 2 was scheduled to restart on June 12, 1988, but because of numerous additional tasks, many which were quite involved, such as weld overlays on the recirculation loop risers and repair of flued head anchors, Unit 2 was unable to restart on schedule. The residents monitored many of the maintenance and surveillance activities accomplished during the outage, as enumerated in paragraphs 2 and 3 of this report. The residents also monitored the startup from the outage.

a. Unit 2 Reactor Water Cleanup (RWCU) System Isolation.

At 9:00 p.m. CDT on June 9, 1988, the RWCU isolation valves closed and the RWCU pumps tripped. The cause was determined to be the removal of jumpers which were installed to bypass the RWCU isolation signal derived from the non-regenerative heat exchanger outlet temperature exceeding 140 degrees F. The jumper was needed to perform the hydrostatic test of the reactor vessel using the RWCU system. The isolation is designed to prevent damage to the RWCU demineralizers, which were isolated and bypassed during the hydrostatic test, since the temperature needed to perform the hydrostatic test is 200 degrees F. The circuit continuity was disrupted when the jumpers were removed, resulting in the valve closure. The valve closure caused the RWCU pumps to trip. The alarms were immediately reset and the RWCU system was restarted.

b. Potentially Contaminated Injured Worker.

At 9:43 p.m. CDT on June 10, 1988, a contractor fell and hit his head while working in the Unit 2 MSIV room. An Unusual Event was declared because the worker was potentially contaminated and his

injuries were serious enough to require that he be transported to the hospital. At 11:17 p.m. on June 10, 1988, it was determined that the worker was not contaminated, so the Unusual Event was terminated. The worker was released from the hospital the next day.

c. Standby Gas Treatment (SBGT) System Automatic Start

At 1:23 a.m. CDT on June 11, 1988, the reactor building ventilation system tripped and the SBGT system automatically started. The cause was attributed to the removal of fuse F6 in panel 902-40, which was removed in order to repair valve AO 2-1601-56, the Unit 2 torus/drywell inertion purge valve. An inadequate review of the consequences of the fuse removal was performed, overlooking the safety implications. Removal of fuse F6 generated a Group 2 isolation signal. Fuse F6 was immediately replaced and the reactor building ventilation and SBGT systems were returned to normal. Maintenance was performed on AO 2-1601-56 by lifting a lead, an activity which, unlike the removal of fuse F6, would not cause an ESF actuation. The inadequate review is being followed as an unresolved item pending further review by the inspectors (254/88015-04; 265/88015-04).

d. Unit 2 RWCU Isolation.

At 8:00 a.m. CDT on June 13, 1988, the Unit 2 RWCU isolated from a high non-regenerative heat exchanger outlet temperature signal. At the time the outlet temperature of the non-regenerative heat exchanger was 130 degrees F, which is below the normal isolation setpoint of 140 degrees F. At the time of the isolation the temperature setpoint had been raised beyond its highest setting of 250 degrees F in order to avoid installing a jumper and risking a spurious RWCU isolation similar to that discussed in paragraph 10(a) of this report. By raising the setpoint beyond 250 F the electrical contact became intermittent, resulting in the RWCU isolation. The alarms were reset and the RWCU system restarted at 8:10 a.m. on June 13, 1988. The procedure for conducting hydrostatic tests has been revised to adjust the temperature switch setpoint to 220 degrees F to preclude future RWCU isolations.

e. Regulatory Guide 1.97, Environmental Qualification.

On June 14, 1988, while performing a quality control hold point inspection of a modification of Unit 2 post accident drywell temperature monitors, it was discovered that nylon splices were installed without Raychem sleeves. The licensee determined that Unit 1 also had nylon splices instead of Ray Chem sleeves. All nylon splices identified on both units were subsequently modified by adding Raychem sleeves.

Additional analysis revealed that the post accident drywell temperature monitors which had nylon splices without Raychem sleeves were inoperable. All six post accident drywell temperature monitors were therefore inoperable on Unit 1 from December 17, 1987, until the Raychem sleeves were added on June 14, 1988. Unit 1 was operated at power during most of this time period.



Technical Specification Table 3.2-4 requires that at least two of the six post accident drywell temperature monitors be operable. If this criterion is violated for more than 7 days, the reactor must be brought to cold shutdown within the next 24 hours. This issue is considered to be an unresolved item which is being investigated by a region-based inspector (254/88015-03(DRP); 265/88015-03(DRP)).

f. Unit 2 ECCS Initiation.

At 12:58 a.m. CDT on 6/19/88, while returning reactor water level instrumentation to service, various ESF actuations occurred including an ECCS initiation. The cause was an improper sequence of valve operation during the return to service. The ESF components were returned to their normal lineup. The next day similar maintenance and valve operations were conducted in the proper sequence, causing no ESF actuation to occur. The improper valve operation is being followed as an unresolved item pending further review by the inspectors (265/88015-05).

g. Unit 2 Primary Containment Isolation Test Failure.

At 4:50 a.m. CDT on June 29, 1988, while performing the Group 2 and 3 primary containment isolation test, the number 3 traveling incore probe (TIP) machine did not withdraw automatically as it should have. The unit operator withdrew it manually. The cause was found to be a blown fuse, which was probably blown during maintenance. The blown fuse was replaced and the automatic retraction mechanism was tested satisfactorily.

h. Unit 2 Safeguard Power Supply Wiring Error.

At 5:00 p.m. CDT on June 22, 1988, with Unit 2 in cold shutdown, the licensee determined that the auto transfer feature of MCC 28/29-5 had failed an operability test conducted after completing a wiring modification. This modification was made in order to allow the auto transfer feature to function even after a loss of DC control power. In accordance with 10 CFR 50.72(b)(2)(i), the licensee notified the NRC Emergency Operations Center of the failure at 7:50 p.m. on June 22, 1988.

The licensee discovered that a wire in the auto transfer circuitry had not been properly landed, thereby preventing the auto transfer of the AC feed for MCC 28/29-5 from bus 29 to bus 28 upon loss of power to bus 29. The wiring error was corrected and the auto transfer feature successfully tested prior to 9:00 p.m. on June 22, 1988. Unit 1 was checked and no similar problem was found. The wiring error is believed to have existed since the plant was licensed on December 14, 1972.

Since the wiring error had existed for more than 15 years, and the auto transfer feature was tested on a periodic basis, numerous opportunities were available to discover the problem. The test

procedure in use entailed opening the feed breaker from bus 29 to MCC 28/29-5. This action not only deenergized MCC 28/29-5, but also closed contact HMA 1951 b, which caused the feed breaker from bus 28 to MCC 28/29-5 to close, thereby reenergizing MCC 28/29-5. If power to bus 29 was lost, MCC 28/29-5 would become deenergized even though the feed breaker from bus 29 to MCC 28/29-5 was still closed. The feed breaker from bus 28 to MCC 28/29-5 would not shut, and MCC 28/29-5 would remain deenergized. Thus the operability test performed to verify the auto transfer feature for MCC 28/29-5 was inadequate.

The test which the licensee performed on June 22, 1988, was more rigorous, since it entailed deenergizing bus 29. This deenergized MCC 28/29-5 without causing the feed breaker from bus 29 to MCC 28/29-5 to open. Thus the feed breaker from bus 28 to MCC 28/29-5 did not shut, so MCC 28/29-5 remained deenergized.

If a LOCA occurred with MCC 28/29-5 deenergized, the LPCI injection valves for both recirculation loops would not have opened, preventing LPCI from injecting, and the recirculation pump suction and discharge valves in both recirculation loops would have been prevented from shutting. Manual backup would have been available, for the unit operator would see slower than expected recovery of reactor vessel level. He would notice no status lights on the RHR inboard and outboard injection valves to both recirculation loops. This would be positive indication that MCC 28/29-5 was deenergized. The operator could then from the control room open the feed breaker from bus 29 to MCC 28/29-5 and close the feed breaker from bus 28 to MCC 28/29-5. This would reenergize MCC 28/29-5. The valves would reposition automatically and LPCI would inject provided that MCC 28/29-5 was reenergized within 5 minutes. If power was restored after 5 minutes, the LPCI injection valves would have to be opened manually, which could be done from the control room.

Throughout this scenario, one core spray pump would have been available, which the FSAR states would be sufficient to prevent fuel damage and would reflood the core within one hour of core spray operation.

The wiring error occurred because the original installer did not connect one end of the white wire to the proper terminal, but left it taped to the green wire, which was a spare. Quality control failed to detect this installation error, and subsequent testing was inadequate to detect the error.

The inability of MCC 28/29-5 to auto transfer from bus 29 to bus 28 upon a loss of bus 29 is contrary to FSAR Section 8.2.3.1 (which requires this auto transfer to be operable) and 10 CFR 50 Appendix A criterion 17 (which requires that on-site electrical power supplies shall have sufficient redundancy to perform their safety functions assuming a single failure), and is an apparent violation of NRC requirements (265/88015-01(DRP)). However, a notice of violation is not being issued at this time because this issue is being reviewed for potential enforcement action. An enforcement conference to discuss this issue is planned for August 26, 1988.

i. 1/2 Diesel Generator Auto Start

At 3:15 p.m. CDT on June 21, 1988, diesel generator 1/2 did not auto start as required during a test of the Unit 2 ECCS. It did auto start when the cover to the autostart relay was removed. At 5:04 p.m. while inspecting the auto start relay the 1/2 diesel generator autostarted when a braided wire touched a contact. The auto start relay was replaced and the ECCS test performed successfully.

The apparent cause of the problem was an improperly routed braided wire. A total of 224 additional relays were examined and four were found to be defective. Two were corrected and the remaining two (on the Unit 1 HPCI gland steam exhauster fan motor annunciator relay and Unit 1 HPCI gland seal condenser hotwell drain annunciator relay) will be corrected during the next Unit 1 outage. The licensee believes that the two relays which are planned to be repaired will function properly even if the braided wire has a discrepancy similar to that which existed in the auto start relay of the 1/2 diesel generator. The improper routing of the braided wire is being followed as an unresolved item pending further review by the inspectors (254/88015-05; 265/88015-05).

One apparent violation and four unresolved items were identified in the review of this area.

11. NRC Information Notices and Bulletins (92701, 92717)

- a. NRC Information Notice Number 88-39: LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event.

In response to the power oscillation event that occurred at LaSalle, operating procedures have been changed at Quad Cities. These changes were made to avoid prolonged operation in regions of instability. This issue is being examined by the BWR owner's group.

- b. NRC Bulletin 88-07: Power Oscillations in Boiling Water Reactors.

This bulletin required licensees to ensure that their procedures and training programs have been modified to reflect the experience gained from the LaSalle dual recirculation pump trip. Lesson plans, attendance rosters and operating procedures were inspected to ensure that the licensee had complied with the requirements of this bulletin. All actions required by this bulletin to have been completed within 15 days of the bulletin's receipt have in fact been completed.

No violations or deviations were identified.

12. Generic Letters (92701)

(Open) GL 84-23: Reactor Vessel Water Level Instrumentation in BWRs.

The completion date for the rerouting of the reactor water reference log has been updated. The completion dates are October, 1989 (U2) and November 1990 (U1).

No violations or deviations were identified.

13. Local Public Document Room

The Senior Resident Inspector inspected the local public document room in the Dixon Public Library on June 7, 1988. The facilities appeared to be adequate.

14. 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 this inspection are discussed in paragraphs 2(h), 10(c), (e), (f), and (i).

15. Exit Interview (30703)

The inspectors met with licensee representatives (denoted in Paragraph 1) throughout the inspection period and at the conclusion of the inspection on August 8, 1988, 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.