

December 23, 1999

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: QUAD CITIES INSPECTION REPORT 50-254/99023(DRP); 50-265/99023(DRP)

Dear Mr. Kingsley:

On December 3, 1999, the NRC completed an inspection at your Quad Cities Units 1 and 2 reactor facilities. The results were discussed with Mr. Dimmette and other members of your staff. The enclosed report presents the results of that inspection.

The inspection was an examination of activities conducted under your license as they relate to safety and to compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, this inspection was conducted by the resident inspectors and focused on reactor safety.

Based on the results of this inspection, NRC identified three issues which were categorized as being of low risk significance. The issues involve two incorrect classifications of equipment failures in the maintenance rule program, and inadequate corrective action related to design control of software. These issues have been entered into your corrective action program. These issues are listed in the summary of findings and are discussed in the report.

In accordance with 10 CFR 2.790 of the NRC's Rules of Practice, a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,

Original signed by
Mark A. Ring

Mark A. Ring, Chief
Reactor Projects Branch 1

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30

Enclosure: Inspection Report 50-254/99023(DRP);

50-265/99023(DRP)

O. Kingsley

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C. Crane, Senior Vice President, Nuclear Operations
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/s/Mark A. Ring

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-254; 50-265
License Nos: DPR-29; DPR-30

Report No: 50-254/99023(DRP); 50-265/99023(DRP)

Licensee: Commonwealth Edison Company (ComEd)

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

Location: 22710 206th Avenue North
Cordova, IL 61242

Dates: October 21 through December 3, 1999

Inspectors: C. Miller, Senior Resident Inspector
K. Walton, Resident Inspector
L. Collins, Resident Inspector

Approved by: Mark Ring, Chief
Reactor Projects Branch 1
Division of Reactor Projects

SUMMARY OF FINDINGS

Quad Cities Nuclear Power Station, Units 1 & 2
NRC Inspection Report 50-254/99023(DRP); 50-265/99023(DRP)

The report covers a 6-week period of resident inspection.

The body of the report is organized by inspection procedures designed to evaluate performance in Mitigating Systems and Barrier Integrity, as well as Performance Indicator Verification. Inspection findings were evaluated according to their potential significance for safety, using the NRC's Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW, or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent little effect on safety. WHITE findings indicate issues with some increased importance to safety, which may require additional NRC inspections. YELLOW findings are more serious issues with an even higher potential to affect safe performance and would require the NRC to take additional actions. RED findings represent an unacceptable loss of margin to safety and would result in the NRC taking significant actions that could include ordering the plant shut down. Those findings that cannot be evaluated for a direct effect on safety with the Significance Determination Process, such as those findings that affect the NRC's ability to oversee licensees, are not assigned a color.

Mitigating Systems

\$ GREEN. The inspectors found that corrective actions for a design control problem with software backups identified in July 1999 were not timely or complete. Approximately 5 months after the station blackout diesel generators had been declared inoperable because of improperly controlled backup software loaded as operating software, engineers had not determined which plant systems were susceptible to improper backup software, had not assessed potential adverse operational impact, and had not corrected some procedure problems identified in implementation of ComEd Procedure NSP-CC-3021, Revision 0, *Control of Computer Software and Services*.⁶ The inspectors found no other examples of improperly controlled software being loaded into operating systems. In addition, the station blackout diesel generators were already inoperable when the problem was discovered, but were available and could have been started locally. Therefore, the risk of this particular occurrence of design control error was considered to have low safety significance (Section 1R17).

Barrier Integrity

\$ GREEN. The inspectors found that two failures of a high pressure coolant injection valve to close in September and October 1999 were not properly classified in the maintenance rule program. Licensee engineers initially failed to consider the second failure of the 1-2301-5 valve to close on October 4, 1999, as a repetitive maintenance preventable functional failure, and failed to monitor the system under (a)(1) of the maintenance rule. This is considered an unresolved item. The valve failure was found to be of low risk significance because the inboard isolation valve was available (Section 1R12.1).

\$ GREEN. The inspectors found that a failure of the Unit 2 outboard containment spray valve to open during VOTES testing on June 29, 1999, was not properly classified as a maintenance rule functional failure. The failure did not cause any of the performance criteria for the containment spray system to be exceeded. The inspectors considered this to be a maintenance rule functional failure determination being inconsistent with the failure cause evaluation. This is an unresolved item. The risk significance of the containment spray valve failure to open was evaluated using the significance determination process and was of low significance due to other equipment that was available (Section 1R12.1).

Other-Performance Indicator Verification

C The inspectors completed the verification inspection for the residual heat removal unavailability performance indicator. The inspectors identified that the licensee had not included 12.5 hours of residual heat removal system unavailability during system logic testing in January 1999. The licensee explained that the rules for system availability, at that time, did not require documenting the safety system unavailability. The licensee elected to report these hours in a future submittal. The extra hours would not cause the residual heat removal system unavailability to cross a color threshold (Section 4OA2.1).

\$ The inspectors completed verification inspection of the reactor coolant system leakage performance indicator and found very minor discrepancies which did not affect the validity of the reported performance indicator (Section 4OA2.2).

\$ The inspectors completed verification inspection of the licensee's performance indicators for scrams, scrams with loss of normal decay heat removal, reactor coolant specific activity, and primary containment leakage. No findings were identified (Section 4OA2).

\$ The inspectors verified that the licensee had properly evaluated and reported the public radiation safety performance indicator (Section 4OA2.7).

Report Details

1. REACTOR SAFETY

Plant Status (71150)

Both units operated at or near full power operation during the period. Operators detected a small fuel pin leak on Unit 2. The licensee's actions and plans to mitigate this barrier degradation were appropriate.

1R03 Emergent Work (71111-03)

1. Inspection Scope

The inspectors observed maintenance activities, spoke with licensee personnel, and reviewed work packages for the following emergent maintenance activities:

Safe Shutdown Makeup Pump (Work Request 970077816), and Standby Gas Treatment (Work Request 990059870).

The inspectors also reviewed these emergent activities to verify that the licensee appropriately prioritized the emergent work, and that other redundant or independent equipment remained operable.

2. Observations and Findings

The inspectors did not identify any findings associated with this inspection activity.

1R04 Equipment Alignments (71111-04)

.1 Reactor Core Isolation Cooling Pressure Indicator Problems

1. Inspection Scope

The inspectors reviewed the problem descriptions and corrective action for NRC-identified discrepancies with indication on differential pressure switches used for the reactor core isolation cooling system.

2. Observations and Findings

Inspectors found isolation switch indication for Units 1 and 2 reactor core isolation cooling systems steam flow reading as high as 23 percent steam flow when the systems were shut down. Switch DPI 2-1360-1A read 23 percent, DPI 1-1360-1A read 10 percent, and DPI 1-1360-1B read 15 percent rated flow. Inspectors reviewed Engineering Operational Problem Response 99-02-1300-45 to ensure the margin for the switches was sufficient to meet Technical Specifications requirements for system isolation. Problem Identification Form Q1999-04056 was issued to investigate the problem following the inspector

identification. Engineers found that calibration data for the switches may have been incorrect or that the indication faces on the gauges were incorrect. The nature of the calibration error could have affected other switches, but the safety function of the reactor core isolation cooling system switches was not challenged. Therefore, this issue was considered to be of low safety significance. The licensee was continuing to investigate what other systems might be affected by a potential calibration problem of these switches, and will address the corrective actions in response to the problem identification form.

1R05 Fire Protection

1. Inspection Scope (71111-05)

The inspectors toured the station blackout diesel generator building and all three emergency diesel generator rooms to determine if transient combustibles were adequately controlled and if fire doors, penetration seals, and dampers were functional. The inspectors also viewed licensee detection, suppression, and mitigation equipment associated with the spaces to provide reasonable assurance that fire protection equipment was able to mitigate a fire in these areas.

2. Observations and Findings

The inspectors did not identify any findings associated with this inspection activity. However, the inspectors identified two fire doors in the station blackout diesel generator building which did not fully close without assistance. The licensee subsequently repaired the two affected doors satisfactorily.

The inspectors also identified two 55-gallon drums of lubricating oil and about 50 gallons of gasoline in the Unit 2 station blackout diesel generator room that were not considered in the original fire loading of the room and not labeled as transient combustibles. The licensee documented this condition on Problem Identification Form Q1999-04090 and later, removed the barrels of oil from the room. The licensee labeled the gasoline and other items in the room in accordance with the transient combustible program.

The licensee stated that the station blackout diesel generator building was not included in the transient combustible program. Originally, the station blackout diesel generators were not needed to safely shut down the facility in the event of a fire. However, the licensee changed the fire protection program to include the use of the station blackout diesel generators during certain fire scenarios. Title 10 CFR Part 50, Appendix R, Section K and the licensee's fire protection program, both required that only safety-related areas be included in the transient combustible program. Since the station blackout diesel generators were not considered to be safety related, the licensee was not required to include the building in the transient combustible program.

Using the Significance Determination Process for this event, the inspectors determined that this event was of low safety significance due to the transient combustibles not affecting the ability of operators to safely shut down the facility.

1R09 In-Service Testing

1. Inspection Scope (71111-09)

The inspectors observed the performance of Quad Cities Operating Surveillance 6600-01, A Diesel Generator Monthly Load Test, which satisfied in-service test requirements for several check valves in the starting air and fuel oil systems.

2. Observations and Findings

There were no findings identified and documented during this inspection.

1R12 Maintenance Rule Implementation

1. Inspection Scope (71111-12)

The inspectors reviewed the following problem identification forms to determine if the equipment problems were properly dispositioned under the maintenance rule:

Q1998-04725 A Stop Check Valve 1-2301-71 Found Stuck Open, @
Q1998-04864 A Unit 2 Electro-hydraulic Leak on Control Valve #4, @
Q1999-02935 A 1-2301-5 Valve, @
Q1999-03343 AMO 1-2301-5 Valve Failed to Close From Control Room, @
Q1999-02391 AU1 EDG failure to start during QCOS 6600-01 Monthly Surveillance, @
Q1999-02575 AMCC 18/19-5 Auto Transfer Time Greater than Acceptance Criteria, @
Q1999-02206 A Containment Spray Valve Failed to Open Initially During VOTES Test, @
Q1999-02600 A Mechanical Seal Failure on Condensate Pump 1B. @

2. Observations and Findings

The inspectors identified two separate instances where licensee engineers failed to properly classify equipment failures in the maintenance rule program. The first issue concerned two failures of the Unit 1 high pressure coolant injection steam supply valve (1-2301-5) to close. Valve closure was required to support the primary containment isolation function. The valve failed to close during testing on September 9, 1999, and the licensee determined the apparent cause was a failure of the control switch. Since the control switch would not affect the automatic operation of the valve if a high pressure coolant injection system isolation was necessary, engineers did not consider the failure to be a functional failure. The control switch was replaced.

The valve again failed to close during testing on October 4. Engineers conducted a root cause investigation to look at both failure events. The root cause report stated that the root cause of the events was occasional mechanical binding of the contactor lever arm in the breaker due to an inadequate contactor maintenance procedure. The control switch was considered to be a contributing cause.

The valve failure on October 4 was determined to be a maintenance-preventable functional failure but was not considered to be repetitive. The inspectors considered the maintenance rule functional failure determination to be inconsistent with the root cause report that addressed both failure events. The licensee reviewed the root cause report and subsequently determined that the failure should be considered repetitive.

An occurrence of a repetitive maintenance preventable functional failure required the system to be considered (a)(1) under the maintenance rule. The licensee intended to create a pseudo-system for 250 Volt contactors, and planned to consider the pseudo-system as a maintenance rule (a)(1) system. This issue was entered into the licensee's corrective action program as Problem Identification Form Q1999-04264. The inspectors considered the failure to initially consider this issue as a repetitive maintenance preventable functional failure and monitor the system under (a)(1) of the maintenance rule an **Unresolved Item (50-254/99023-01)** pending further review by the NRC maintenance rule review board. The risk significance of the high pressure coolant injection valve failure to close was evaluated in Inspection Report 50-254/99020; 50-265/99020 and found to be of low significance.

The second issue involved the failure of the Unit 2 outboard containment spray valve (2-1001-23B) to open during VOTES testing on June 29, 1999. The maintenance rule evaluation stated the valve stroked properly during monthly tests and that the cause of failure during the VOTES test was unknown. The failure was not considered to be a functional failure. A separate document that was an attachment to an operability assessment did not conclusively proclaim the cause of the failure but stated that evidence pointed to the electrical supply circuit from the MCC [motor control center] to the motor as the most likely cause. The operability assessment described unusual physical conditions found in the contactor (a bent stationary AA@phase contact and very little arcing marks on the moveable AA@phase contact in comparison to the other two phases) and concluded that it was possible that the internal contacts inside the contactor failed to make sufficient contact.

Given this additional information, the inspectors concluded that the valve failure may have been a functional failure. After further review, the licensee also planned to consider this failure a maintenance rule functional failure. In this case the failure did not cause any of the performance criteria for the containment spray system to be exceeded. This issue was entered into the licensee's corrective action program as Problem Identification Form Q1999-04265. The inspectors considered this to be a second example of a maintenance rule functional failure determination being inconsistent with the failure cause evaluation. This is an **Unresolved Item (50-265/99023-02)** pending further review by the NRC maintenance rule review board. The risk significance of the containment spray valve failure to open was evaluated in Inspection Report 50-254/99012; 50-265/99012 and found to be of low significance.

1R13 Maintenance Work Prioritization and Control

1. Inspection Scope (71111-13)

The inspectors reviewed the licensee's planned maintenance activity schedule for the week of November 15, 1999. The inspection activity included a review of the licensee's work week safety profile and verification of risk results with the licensee's computer program. The inspection activities also included, in-plant tours, verification of operability of redundant components, and communications with licensee staff.

2. Observations and Findings

No observations or findings were identified during this inspection activity.

1R15 Operability Evaluations

3. Inspection Scope

The inspectors reviewed the operability evaluation for safety relief valves associated with Problem Identification Form Q1999-03992.

4. Observations and Findings

No findings or observations were identified from this inspection.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed corrective action for a problem discovered July 2, 1999, which involved uncontrolled backup software for the station blackout emergency diesel generators. Inspectors reviewed the corrective actions from the problem identification form to ensure that not only the initial problem had been corrected, but that the cause of the loss of design control of the software had been fixed and any systems possibly affected by the problem were identified and corrected.

2. Observations and Findings

The inspectors found that corrective actions for a design control problem with software backups did not receive appropriate corrective action. Problem Identification Forms Q1999-02311 and Q1999-02250 were written to document the problems observed during a Y2K software upgrade to the station blackout diesel generators. During the modification, the backup software was used to add Y2K modifications, then was loaded as the operating software for the station blackout diesel generators. Following the modification, when some functions of the generators did not work properly, engineers found that the backup software had not been properly controlled. Previous changes to the operating software had not been added to the backup software to ensure that both were controlled according to the design of the system.

The inspectors found that the software for the station blackout diesel generators had since been modified with the appropriate changes needed to ensure engine operability.

However, the licensee had not taken sufficient action to ensure that other digital systems which may have been affected by backup software problems were identified and corrected. Problem Identification Form Q1999-02250 dated July 2, 1999, initially specified an action item to evaluate and determine corrective actions, with a 30-day due date. That action was closed one month later to an action item (Action Tracking Number 13335) to obtain the list of known site software and associated owners and determine those associated with plant operations. On September 9, 1999, engineers found that a requested list was not all inclusive and initiated another tracking item on September 15, 1999. That item had a due date of November 12, 1999, but was not completed. Instead, an extension was granted to December 3, 1999, to complete the list. The inspectors found that the corrective action program no longer was tracking an item to find and fix backup software that may have resulted from poor design control. Following discussions with the inspectors, the licensee initiated an engineering action plan with Tracking Number 99-00-071. This plan included more detailed actions for ensuring that design control of software was adequate.

The inspectors found that approximately 5 months after the station blackout diesel generators had been declared inoperable because of improperly controlled backup software loaded as operating software, engineers had not determined which plant systems were susceptible to improper backup software, which of those systems could result in adverse operational conditions, and had not corrected procedure problems identified in implementation of ComEd Procedure NSP-CC-3021, Revision 0, AControl of Computer Software and Services.@

The inspectors found no other examples of improperly controlled software being loaded into operating systems. In addition, the station blackout diesel generators were declared inoperable when the problem was discovered, but were available and could have been started locally. Therefore, the risk of this particular occurrence of design control error was considered to have low safety significance. Further significance may be discovered once the licensee's investigation into the extent of condition of this problem is complete.

1R19 Post Maintenance Testing

a. Inspection Scope (71111-19)

The inspectors reviewed operator logs and the following Quad Cities Operating Procedures (QCOP), Quad Cities Operating Surveillance (QCOS) Tests and work requests associated with maintenance performed on both the standby gas treatment system and safe shutdown makeup pump system:

QCOP 1700-05, AReactor Building Ventilation Radiation Monitors@
QCOS 2900-01, ASafe Shutdown Makeup Pump Flow Rate Test@
QCOS 2900-08, ASafe Shutdown Makeup Pump Performance Test@
Work Request 970077816, Safe Shutdown Makeup Pump
Work Request 990059870, Standby Gas Treatment

2. Observations and Findings

The inspectors did not identify any findings associated with this inspection activity.

4. OTHER ACTIVITIES (OA)

4OA1 Identification and Resolution of Problems

.1 Transient Combustible Program Deficiency Not Identified Properly

1. Inspection Scope (71152)

The inspectors reviewed problem identification forms, attended event screening committee meetings, and spoke to corrective action department personnel.

2. Observations and Findings

The inspectors identified that the event screening committee did not identify a programmatic deficiency with the transient combustible program. The inspectors spoke to corrective action program personnel who later assigned a corrective action item to the appropriate department. This deficiency was later identified on Problem Identification Form Q1999-04199.

The inspectors reviewed Problem Identification Form Q1999-04090, AUnapproved Combustible Transients in Station Blackout Diesel Generator Building.@ Engineering personnel identified that the building was not included in the transient combustible program. However, the events screening committee assigned corrective action tracking items for the Operations and Maintenance departments, but not the Engineering department. The inspectors understood that the programmatic deficiency described by the form would not be corrected by either Operations or Maintenance departments.

The inspectors spoke with corrective action personnel who confirmed that no additional problem identification form was generated to address this problem and that the action tracking items assigned to Problem Identification Form Q1999-04090 would not implement the corrective actions proposed by engineers. After speaking with the inspectors, the licensee added an additional action tracking item to engineers to review the transient combustible program for the station blackout building.

.2 Incomplete Corrective action for Motor Operated Valve Failure

1. Inspection Scope

The inspectors reviewed the licensee-s corrective actions related to an August 4, 1999, failure of the Unit 1 residual heat removal cross-tie valve (1-1001-19A) to fully close under dynamic differential pressure testing.

2. Observations and Findings

Inspectors found incomplete corrective actions taken to ensure the August 4, 1999, failure experienced on the 19A valve was not indicative of other motor operated valve dynamic performance problems. The valve had been tested as part of a joint owner-s group

initiative to test a representative sample of motor operated valves in dynamic conditions. Quad Cities planned to use the test as representative of the performance of other similar valves. The inspector-s review of Problem Identification Form Q1999-03138, which documented the failure, indicated that although operability of the valve itself was not in question, other similar valves had not been proven to be acceptable during dynamic flow conditions. Corrective actions to address the other valves represented by the dynamic test of the 19A valve had not been taken. A test scheduled for one of the valves was canceled and not rescheduled as of December 3, 1999. Justification for acceptable operation based on previous satisfactory dynamic testing of similar valves at Quad Cities or other stations was not available. The licensee planned to provide more information to the inspector regarding valve performance related to the problem identification form at the close of the period.

4OA2 Performance Indicator Verification

.1 Safety System Unavailability - Residual Heat Removal

5. Inspection Scope (71151)

The inspectors reviewed operator logs and selected out-of-service records from the fourth quarter 1998 and the first and third quarters 1999.

6. Observations and Findings

Inspectors completed the verification inspection for the residual heat removal performance indicator. The inspectors identified that the licensee did not report 12.5 hours of unavailability for the AB@train of residual heat removal system during performance of a logic test in January 1999. The licensee explained that the rules in place at the time allowed crediting manual actions to rack in electrical breakers during testing to make the equipment available. The licensee documented this on Problem Identification Form Q1999-03797. Even though this discrepancy occurred prior to the start of the performance indicator reporting program (June 1999), and was allowed under the existing rules, the licensee planned to report the extra 12.5 hours in a future performance indicator submittal. The extra hours would not have caused the residual heat removal system unavailability to cross a color threshold.

.2 Reactor Coolant System Leakage Performance Indicator Verification

7. Inspection Scope (71151)

The inspectors reviewed performance indicator data for the reactor coolant system leakage performance indicator for the months of September and October 1999 for Units 1 and 2. The inspectors also reviewed Problem Identification Form Q1999-03710 which documented data collection problems for this performance indicator.

8. Observations and Findings

Inspectors completed the verification inspection for the reactor coolant system leakage performance indicator. The inspectors found that prior to October 1999, the licensee did not use data generated by the surveillance test required by the Technical Specifications for reactor coolant system leakage. Instead, the licensee used data recorded by radiation waste area supervisors which was used for trending purposes. This issue was documented on the problem identification form and was appropriately resolved. From October forward, the licensee planned to use data collected during the surveillance test. During the review of September data, the inspectors found minor differences in reported reactor coolant leakage performance indicator data and the actual data recorded on the surveillance test. This minor problem resulted in a reported value that slightly exceeded the actual leakage value. This problem did not affect the NRC's use of the indicator for assessment purposes because the leakage value was clearly in the licensee response band and did not approach the GREEN-WHITE threshold.

.3 Reactor Scrams Performance Indicator Verification

1. Inspection Scope (71151)

The inspectors reviewed licensee event reports, operator logs, and licensee power histories from January 1998 until October 1999 in order to verify the licensee's performance indicators for scrams.

2. Observations and Findings

Inspectors completed the verification inspection for the reactor scrams performance indicator. The inspectors did not identify any observations or findings associated with this activity.

.4 Reactor Scrams With Loss of Normal Heat Removal Performance Indicator Verification

1. Inspection Scope (71151)

The inspectors reviewed licensee event reports, operator logs, and licensee power histories from October 1996 until October 1999 in order to verify the licensee's performance indicators for scrams with loss of normal heat removal.

2. Observations and Findings

Inspectors completed verification inspection for the reactor scrams with loss of normal heat removal performance indicator. The inspectors did not identify any observations or findings associated with this inspection activity.

.5 Reactor Coolant System Specific Activity Performance Indicator Verification

3. Inspection Scope (71151)

The inspectors reviewed chemistry logs from January through October 1999 in order to verify the licensee's performance indicator for reactor coolant system activity. The inspectors also reviewed chemistry procedures and observed counting of a reactor coolant system sample.

4. Observations and Findings

Inspectors completed the verification inspection for the reactor coolant system specific activity performance indicator. The inspectors did not identify any observations or findings associated with this inspection activity.

.6 Containment Leakage Performance Indicator Verification

9. Inspection Scope (71151)

The inspectors reviewed the performance data for the containment leakage indicator. This review included interviewing personnel responsible for data input, evaluating site performance indicator validation sheets, and reviewing performance indicator verification and validation packages for select containment leakage parameters.

10. Observations and Findings

Inspectors completed the verification inspection for the containment leakage performance indicator. The inspectors found no discrepancies with the reported performance indicator data. Minor discrepancies had been previously noted by the licensee and corrected.

.7 Public Radiation Safety

1. Inspection Scope (71151)

As documented in NRC Inspection Report 50-254/99013(DRS); 50-265/99013(DRS), the inspectors had reviewed the licensee's evaluation of the performance indicator for the public radiation safety cornerstone.

2. Observations and Findings

Inspectors completed the verification inspection for public radiation safety. The inspectors found no problems with the accuracy or completeness of the licensee's performance indicator data, which was in the GREEN performance band for the first quarter of 1999.

40A3 Event Follow-up

.1 Fuel Pin Leak on Unit 2

3. Inspection Scope (71153)

The inspectors reviewed the licensee response to indications of a Unit 2 fuel pin leak.

4. Observations and Findings

Inspectors found licensee actions in response to a leaking fuel pin to be appropriate and timely. On November 8, 1999, operators found indications that a fuel pin leak had

occurred on Unit 2. Offgas radiation levels increased to approximately double the previous value of 1250 microcuries per second. The levels were well below the Technical Specification limits for offgas. Equivalent iodine concentrations did not increase, and remained well below Technical Specification values. Licensee experience with other fuel pin failures indicated that the leak was likely a minor crack in the cladding of one fuel pin.

Inspectors found licensee actions to pinpoint the location of the leaking fuel pin to the M-8 fuel cell location to be appropriate and timely. Other actions taken to ensure reactor power manipulations did not worsen the crack were conservative. The licensee planned to positively identify and replace the leaking fuel bundle in the next refueling outage scheduled for January 2000. The licensee used Problem Identification Form Q1999-03867 to track the corrective actions for this problem.

.2 Review of Licensee Event Reports

a. Inspection Scope (71153)

The inspectors reviewed the following licensee event reports for accuracy and to verify that corrective actions were implemented.

2. Observations and Findings

(Closed) Licensee Event Report 50-254/97024-00: Report Not Submitted to NRC. The licensee identified that the 10 CFR 50.59 summary report of changes to the updated safety analysis report was not submitted. The licensee later submitted the report to the NRC. There was no risk significance to this event. This licensee event report is closed.

(Closed) Licensee Event Report 50-254/97027-00: Emergency Diesel Generators to Unit 1 Inoperable Simultaneously. The licensee removed the Unit 1 emergency diesel generator from service for maintenance. Later, the licensee identified that a time delay relay for the shared emergency diesel generator had not met the required time limits. The licensee entered into Technical Specification 3.0.3 and made preparations to shut down Unit 1. The licensee tested and replaced a spare time delay relay and declared the shared emergency diesel generator operable. The corrective actions as stated in the report have been completed.

Both emergency diesel generators being inoperable resulted in an increase in core damage frequency of about 50 times nominal risk. However, the station blackout diesel generator was available to mitigate any loss of offsite power initiating events. This licensee event report is closed.

(Closed) Licensee Event Report 50-254/98001-00 and 50-254/98001-01: Unit 1 Emergency Diesel Generator Failed to Start on Inadvertent Signal. During testing, an instrument maintenance technician inadvertently actuated the diesel start relay. Control room operators received diesel start alarms but the diesel did not start. Upon resetting the diesel alarms, the Unit 1 emergency diesel started. The licensee later identified a

degraded fuse clip as the most likely cause of the failure of the diesel to start. The licensee replaced the degraded fuse clip.

The risk significance of this event was minimal. Operators had shut down Unit 1 about 16 days prior to this event. Core decay heat was low enough to be removed by the reactor water cleanup system. The redundant shared emergency diesel generator and the station blackout diesel generator were both available to mitigate any loss of offsite power events. The Unit 1 emergency diesel generator was available. This licensee event report is closed.

(Closed) Licensee Event Report 50-254/98016-00: Scram Discharge Volume Instruments Exceeded Set Point Margins. This issue was previously discussed and documented as a violation (50-254/98009-05; 50-265/98009-05). Corrective actions were completed.

The maximum identified set point error of 3.5 gallons above the 40 gallon set point would not affect the capability of the system to perform its safety function. This licensee event report is closed.

(Closed) Licensee Event Report 50-254/98019-00: High Reactor Pressure Permissive Shutdown Cooling Switch Degraded. With Unit 1 at 100 percent of rated power, the licensee identified that one of two pressure switches allowing operation of the shutdown cooling system failed to close during testing. The licensee declared the switch inoperable and placed the system into a tripped condition as required by Technical Specifications. This switch failure would result in operators being unable to open the shutdown cooling suction valves from the control room. The licensee determined the switch failed as a result of aging and replaced the switch.

This event was of low safety significance with the unit at full power operation. In order to use this circuit, the unit would be required to be shut down and at low reactor pressures. These suction valves could have been opened locally by manual operation if required. This licensee event report is closed.

(Closed) Licensee Event Report 50-265/99001-00: Engineered Safeguard Feature Actuation due to a Failed Voltage Regulator. The voltage regulator failure resulted in half channel actuations of the reactor protective system, and the primary containment isolation systems. The reactor water cleanup system and some primary containment valves closed as a result of this event. The licensee attributed this failure to not including the voltage regulator in a preventive maintenance program. The licensee completed the corrective actions as stated in the report.

This event was of low safety significance. The signal generated as a result of the voltage regulator failure resulted in components properly responding. This licensee event report is closed.

(Closed) Licensee Event Report 50-254/99002-01: Reactor Scram due to Steam Intrusion into the Scram Discharge Volume. The revision to this report added information as to why the emergency diesel generator started during this event. There was no safety significance to this revision. This licensee event report is closed.

4OA4 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Dimmette and other members of licensee management at the conclusion of the inspection on December 3, 1999. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Barnes Quad Cities Plant Manager
C. Crane Nuclear Generation Group Senior Vice President
J. Dimmette Quad Cities Site Vice President
O. Kingsley Nuclear Generation Group Chief Nuclear Officer

NRC

J. Dyer NRC Region III, Regional Administrator
M. Ring NRC Region III, Branch Chief, Division of Reactor Projects

Illinois Department of Nuclear Safety

R. Ganser Resident Engineer

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-254/99023-01; URI Failure to Include as Repetitive Maintenance Rule Functional Failure
50-265/99023-02 URI Failure to Include as Repetitive Maintenance Rule Functional Failure

Closed

50-254/97024-00 LER Report Not Submitted to NRC
50-254/97027-00 LER Emergency Diesel Generators to Unit 1 Inoperable Simultaneously
50-254/98001-00 LER Unit 1 Emergency Diesel Generator Failed to Start on Inadvertent Signal
50-254/98001-01 LER Unit 1 Emergency Diesel Generator Failed to Start on Inadvertent Signal
50-254/98016-00 LER Scram Discharge Volume Instruments Exceeded Set Point Margins
50-254/98019-00 LER High Reactor Pressure Permissive Shutdown Cooling Switch Degraded
50-265/99001-00 LER Engineered Safeguard Feature Actuation due to a Failed Voltage Regulator
50-254/99002-01 LER Reactor Scram due to Steam Intrusion into the Scram Discharge Volume

Discussed

50-254/98009-05; VIO Scram Discharge Volume Instruments Exceeded Set Point Margins
50-265/98009-05

LIST OF BASELINE INSPECTIONS PERFORMED

The following inspectable-area procedures were used to perform inspections during the report period. Documented findings are contained in the body of the report.

<u>Inspection Procedure</u>		<u>Report Section</u>
<u>Number</u>	<u>Title</u>	
71111-03	Emergent Work	1R03
71111-04	Equipment Alignment	1R04
71111-05	Fire Protection	1R05
71111-09	In-Service Testing	1R09
71111-12	Maintenance Rule Implementation	1R12
71111-13	Maintenance Work Prioritization & Control	1R13
71111-15	Operator Evaluations	1R15
71111-17	Permanent Plant Modifications	1R17
71111-19	Post Maintenance Testing	1R19
71151	Performance Indicator Verification	4OA2
71152	Identification and Resolution of Problems	4OA1
71153	Event Follow-up	4OA3
(none)	Other	4OA4
(none)	Management Meetings	4OA5

LIST OF ACRONYMS AND INITIALISMS USED

CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
IDNS	Illinois Department of Nuclear Safety
IFI	Inspection Follow-up Item
LER	Licensee Event Report
QCOP	Quad Cities Operating Procedure
QCOS	Quad Cities Operating Surveillance
URI	Unresolved Item
VIO	Violation