

April 30, 2001

Mr. Oliver D. Kingsley, President  
Exelon Nuclear  
Exelon Generation Company, LLC  
Quad Cities Nuclear Power Station  
1400 Opus Place, Suite 500  
Downers Grove, IL 60515

SUBJECT: QUAD CITIES NUCLEAR POWER STATION  
NRC INTEGRATED INSPECTION REPORT 50-254/01-05; 50-265/01-05

Dear Mr. Kingsley:

On March 31, 2001, the NRC completed an inspection at your Quad Cities Units 1 and 2 reactor facilities. The enclosed report documents the inspection findings which were discussed on March 30, 2001, with Mr. Tulon and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

On March 31, 2001, the local International Brotherhood of Electrical Workers (IBEW) union contract with ComEd expired. Because negotiations between the union and Exelon (ComEd) management indicated that an agreement was not likely prior to expiration of the contract, the NRC conducted an inspection to evaluate the licensee's strike contingency plans. This inspection, conducted prior to the expiration of the contract at Quad Cities, verified that the licensee's plan met all requirements of the Technical Specifications and Federal Regulations in the event that a strike were to occur.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green). These two issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these Non-Cited Violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Quad Cities Nuclear Power Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Mark A. Ring, Chief  
Projects Branch 1  
Division of Reactor Projects

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

Enclosure: Inspection Report 50-254/01-05; 50-265/01-05

cc w/encl: W. Bohlke, Senior Vice President, Nuclear Services  
C. Crane, Senior Vice President - Mid-West Regional  
J. Cotton, Senior Vice President - Operations Support  
J. Benjamin, Vice President - Licensing and Regulatory Affairs  
R. Krich, Director - Licensing  
H. Stanley, Operations Vice President  
J. Skolds, Chief Operating Officer  
R. Helfrich, Senior Counsel, Nuclear  
DCD - Licensing  
T. J. Tulon, Site Vice President  
G. Barnes, Quad Cities Station Manager  
W. Beck, Regulatory Affairs Manager  
W. Leach, Manager - Nuclear  
Vice President - Law and Regulatory Affairs  
Mid American Energy Company  
M. Aguilar, Assistant Attorney General  
Illinois Department of Nuclear Safety  
State Liaison Officer, State of Illinois  
State Liaison Officer, State of Iowa  
Chairman, Illinois Commerce Commission

DOCUMENT NAME: G:\QUAD\qua2001-05drp.wpd

To receive a copy of this document, indicate in the box: "C" = Copy without enclosure "E"= Copy with enclosure "N"= No copy

OFFICE	RIII		RIII		RIII	E		
NAME	PPelke/trn		RLerch		MRing			
DATE	04/27/01		04/27/01		04/30/01			

**OFFICIAL RECORD COPY**

ADAMS Distribution:

AJM

DFT

SNB

GEG

HBC

CGM

C. Ariano (hard copy)

DRPIII

DRSIII

PLB1

JRK1

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-254/01-05; 50-265/01-05

Licensee: Exelon Nuclear

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

Location: 22710 206th Avenue North  
Cordova, IL 61242

Dates: February 15 through March 31, 2001

Inspectors: C. Miller, Senior Resident Inspector  
J. Adams, Resident Inspector  
M. Holmberg, Reactor Engineer  
P. Lougheed, Reactor Engineer  
D. Schrum, Reactor Engineer  
T. Madedo, Physical Security Inspector  
D. Funk, Physical Security Inspector

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

## SUMMARY OF FINDINGS

IR 05000254-01-05, IR 05000265-01-05, on 02/15 - 03/31/2001, Exelon Nuclear, Quad Cities Nuclear Power Station, Units 1 & 2. Personnel performance during non-routine plant events, maintenance rule, and surveillance testing.

The inspection was conducted by resident and regional inspectors. The inspection identified two Green issues, both of which were Non-Cited Violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

### **Cornerstone: Mitigating Systems**

Green. Inspectors identified that on two occasions, March 9 and March 27, the licensee performed technical specification required surveillance testing involving timing of the Unit 1 and Unit 2 emergency diesel generators shortly after the engines had been shut down from previous runs. Station procedures were inadequate in prescribing the conditions for performance of the tests. The procedures did not prevent preconditioning of the air start systems, fuel systems, and other engine and electrical components.

The use of inadequate procedures for testing was considered a Non-Cited Violation of 10 CFR Appendix B, Criterion XI, "Test Control," which requires that operational test procedures ensure the testing is performed under suitable conditions. The risk significance was very low (Green) because inspectors determined that testing practices had not led to declining performance of the diesel generators (Section 1R22).

### **Cornerstone: Initiating Events**

Green. On March 23, an operator-induced loss of feedwater heating transient occurred on Unit 2. The inspectors found that the operators failed to immediately recognize a reduction in feedwater heating and take prompt action to effectively control the increasing reactor power. The transient resulted in a 33 degree decrease in feedwater inlet temperature adding sufficient positive reactivity to increase reactor thermal power from 2511 to 2578 megawatts, approximately 102.7 percent of maximum licensed power.

Quad Cities License DPR 30, Section 3.a., states, "Exelon Generation Company is authorized to operate Unit 2 at power levels not in excess of 2511 megawatts thermal." Exceeding the maximum thermal power of 2511 megawatts thermal was considered a Non-Cited Violation. The risk significance of this event was determined to be very low (Green) due to the relatively small increase a 2.7 percent power change will have on overall core thermal limits (Section 1R14).

## Report Details

### 1. REACTOR SAFETY

#### Plant Status

Unit 1 entered the period operating at or near full power until February 25, when power was reduced to 60 percent to perform planned maintenance and testing on three control rod hydraulic control units. Unit 1 was returned to full power operation later that day and operated at or near full power for the remainder of the period, except for minor power decreases for turbine testing and/or control rod positioning.

Unit 2 entered the period operating at or near full power until March 16, when the unit was shutdown for a three day maintenance outage to repair reactor recirculation pump seals, feedwater check valve leakage, and electro-hydraulic system solenoid operated valves. Operators returned Unit 2 to full power operation on March 19. Unit 2 operated at or near full power for the remainder of the period, except for minor power decreases for turbine testing and/or control rod positioning.

#### 1R04 Equipment Alignments (71111.04)

##### a. Inspection Scope

The inspectors verified the system alignment of the accessible portion of the Unit 2A train of core spray during the unavailability of the 2B train of core spray for planned maintenance activities. In addition, inspectors also verified alignments of the Unit 2 automatic depressurization system, Unit 2 core spray system, and the low pressure coolant injection mode of operation of the Unit 2 residual heat removal system during the unavailability of the Unit 2 high pressure coolant injection system.

The inspectors verified that the system component configuration and system operating parameters supported the system's ability to perform design functions. The inspectors reviewed design and licensing information and discussed system performance with licensee personnel.

##### b. Findings

No findings of significance were identified.

#### 1R05 Fire Protection Walkdowns (71111.05)

##### a. Inspection Scope

The inspectors conducted fire protection walkdowns of the cable spreading room (Fire Zone 3.0), the auxiliary electric equipment room (Fire Zone 6.3), and the old computer room (Fire Zone 4.0). Each of these fire zones contained equipment related to the Mitigating Systems Cornerstone. The inspectors verified the proper control of transient

combustibles and ignition sources, the material condition of fire detection and fire suppression systems, the operational lineup of fire detection and fire suppression systems, the maintenance of fire protection equipment, and the material condition and operational status of fire barriers. The inspectors discussed issues associated with the fire zones with the fire marshal, fire protection engineer, and licensee management. The inspectors reviewed the following documents:

- Quad Cities Units 1 and 2 Updated Fire Hazards Analysis, Section 4.3, “Cable Spreading Room,” Revision 12
- Quad Cities Units 1 and 2 Updated Fire Hazards Analysis, Section 4.3, “Auxiliary Electric Equipment Room,” Revision 12
- Quad Cities Units 1 and 2 Updated Fire Hazards Analysis, Section 4.3, “Old Computer Room,” Revision 12

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

.1 Ultimate Heat Sink Performance in the Event of Lock and Dam 14 Failure

a. Inspection Scope

The inspectors reviewed the licensee’s ability to provide the required makeup river water flow to the ultimate heat sink in the event of a failure of Lock and Dam 14. The inspectors reviewed Quad Cities Abnormal Operating Procedure (QCOA) 0010-14, “Lock and Dam #14 Failure,” and the Quad Cities Updated Final Safety Analysis Report, Section 9.2.5.

b. Findings

The inspectors reviewed an operability determination for Condition Report Q2000-00190, “Weakness in External Flood Response Procedure,” and noted that the licensee identified that equipment required to implement the actions specified in QCOA 0010-16, “Flood Emergency Procedure,” had not been maintained onsite. Specifically, the three pumps referred to as the rainbow pumps were no longer located on site. The removal of the rainbow pumps was contrary to the QCOA 0010-16 requirement to maintain a portable pump onsite to provide makeup water to the fuel pool during an external flood. However, the operability determination demonstrated that the pump on the site fire truck could provide the required make-up water.

The inspectors reviewed an operability determination for Condition Report 2001-00833, “Trash Rake Partially Blocked by Debris,” and noted that the Updated Final Safety Analysis Report, Section 9.2.5, stated that portable pumps with a total flow capacity of 5100 gallons per minute (gpm) were to be maintained on site to support maintenance of the ultimate heat sink in the event of a failure of Lock and Dam 14. The licensee had not addressed the concern that the rainbow pumps, which were the portable pumps with capacity to meet the required 5100 gpm flow, were not available on site to supplement



the ultimate heat sink as discussed in the Updated Final Safety Analysis Report and QCOA 0010-14.

Based on the risk importance of the service water systems supplied from the ultimate heat sink in the licensee's risk assessment, the inspectors determined that additional information and evaluation using the SDP was needed to reach a conclusion on this issue. The inspectors considered this issue **Unresolved Item 50-254/01-05-01; 50-265/01-05-01**, pending further information on ultimate heat sink makeup sources, on licensee corrective actions from Condition Report Q2000-00190, and on conclusions from the SDP.

.2 Biennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed documents associated with inspection and maintenance of the turbine building closed cooling water heat exchangers and the residual heat removal service water cubicle coolers. These heat exchangers were chosen for review based on their relatively high risk achievement worth. The inspectors reviewed work orders, inspection results, and associated calculations to confirm that these heat exchangers met design heat removal requirements and that maintenance practices were adequate to assure design performance. The inspectors also reviewed the maintenance procedure for the diesel generator lube oil coolers, which specified the vendor recommendations for the maximum number of plugged tubes. The inspectors reviewed licensee activities on the heat exchangers to confirm that methods used to inspect heat exchangers were consistent with expected degradation, that acceptance criteria were established, consistent with accepted industry standards, and that as-found results were appropriately dispositioned.

The inspectors reviewed condition reports concerning heat exchanger and heat sink performance issues to verify that an appropriate threshold for identifying issues had been established. The inspectors also evaluated the effectiveness of the corrective actions for identified issues, including the engineering justification for operability, if applicable. Documents reviewed are included at the end of the report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors assessed licensed operator performance and the training evaluators' critiques during licensed operator simulator training sessions. The inspectors observed Crew B on March 7 and Crew E on March 28. During the observations, the inspectors focused on the operators' response to alarms, the unit supervisors' command and control

of crew activities, communication practices, procedural adherence, and shift managers' implementation of emergency plan requirements.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the maintenance rule, including a review of scoping, goal setting, performance monitoring, expert panel meeting minutes, short-term and long-term corrective actions, and current equipment performance status. The inspectors reviewed the following condition reports for proper maintenance rule classifications:

Initiating Events Cornerstone

- Unit 1 Reactor Recirculation Condition Reports Q2000-04088, Q2000-04137, and Q2000-04137

Mitigating Systems Cornerstone

- Unit 1 Reactor Core Isolation Cooling Condition Reports Q2000-03841
- Control Room Heating, Ventilation and Air Conditioning Condition Reports Q1999-04354, Q2000-02869, and Q2001-01891
- Cross Tie Breaker Condition Report 2000-03874

b. Findings

The inspectors found that performance criteria for two different systems were not consistent with assumptions in the Quad Cities Individual Plant Examination submittal of 1993 as updated by the 1996 probabilistic safety assessment (PSA) update. In addition, the inspectors found that condition monitoring criteria were not established to ensure maintenance was effective for 4kV safety bus cross-tie breakers. The inspectors also found that the licensee had not updated some portions of the PSA related to equipment performance since 1996, and had not met station procedure recommendations to update the PSA every 2 years. While no regulatory requirements were missed, the inspectors found that failure to incorporate equipment performance data on a timely basis, failure to make performance criteria consistent with PSA information, and failure to establish criteria for condition monitoring, could lead to inadequate assessment of maintenance performance. The significance of this issue was considered more than minor because if left uncorrected, the failure to properly monitor the effectiveness of maintenance could become a more significant safety concern. The combined effects of multiple system, structure and component performance criteria being beyond that supported by the PSA, of not updating the PSA for equipment performance since 1996, and of not establishing condition monitoring criteria could not be determined by the SDP and was considered to be an unresolved item.

Inspectors found that licensee procedures and practices for maintenance were not consistent with the guidance of Regulatory Guide 1.160 "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and Nuclear Energy Institute guidance NUMARC 93-01, Revision 2, "Industry Guideline For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." For the 4kV cross-tie breakers (system Z6700), the performance criteria was zero maintenance preventable functional failures, which was consistent with failure rate criteria in the PSA. Inspectors reviewed a recent failure which had occurred on the Bus 23-1 to Bus 13-1 breaker in October 2000 (Condition Report 2000-03874). Following the failure, the performance criteria was changed to allow as many as 4 cross-tie breaker failures per 2 year outage cycle (1 failure per breaker) with the breakers still in the maintenance rule a(2) category. With only about 16 breaker operations per 2 year period, this increased failure rate allowance represented a 25 percent failure rate per demand. The PSA indicated only a 0.03 percent failure rate or  $3E-4$  per demand. Regulatory Guide 1.160 indicated that the number of maintenance preventable functional failures allowed per evaluation period should be consistent with the assumptions in the risk analysis.

The licensee used a method proposed by the Electric Power Research Institute (EPRI TR-105396, "Probabilistic Safety Assessment Applications Guide") to make the changes to the performance criteria. The Electric Power Research Institute method allowed changes in the performance criteria to be made even though the changes were not consistent with the PSA, as long as certain limits for risk were in place. (The risk limits were met.) However, NRC has not officially approved the EPRI methodology; therefore, the inspectors used Inspection Procedure 71111-12, "Maintenance Rule" and Regulatory Guide 1.160 in determining that maintenance rule performance criteria should be consistent with the equipment performance stated in the PSA.

The inspectors also found that performance criteria for the cross-tie breakers, which had values considered too small to be effectively monitored and trended by the maintenance rule, did not have condition monitoring criteria established. The Regulatory Guide 1.160 guidance requiring establishment of criteria for condition monitoring, was intended to ensure that licensees could demonstrate that maintenance was effective. For the cross-tie breakers, Quad Cities had established preventive maintenance activities and normal operator rounds as well as an annual review of breaker performance as part of a condition monitoring plan. However, no criteria was established for condition monitoring as described in Regulatory Guide 1.160. Therefore, there was no guidance in place to determine whether maintenance was effective or not. Engineers indicated that better criteria would be established by June 15, and an action tracking item was initiated with Tracking Number 48149-01.

During an inspection of the reactor core isolation cooling system, inspectors found that system performance criteria for availability was also changed in a manner inconsistent with the PSA. The review by the inspectors indicated that a system unavailability of 197.1 hours in 24 months could be supported by the PSA before the system should be classified as a(1) in the maintenance rule. The licensee changed the reactor core isolation cooling unavailability performance criteria from 100 hours in 18 months (approximately 133 hours in 24 months) to 315 hours in 24 months. The accumulated unavailability hours at the time of the change for Unit 1 reactor core isolation cooling was 153.63 hours and Unit 2 had 195.79 hours. Both reactor core isolation cooling systems

were classified as a(1). Following the change in unavailability performance criteria, both Unit 1 and 2 reactor core isolation cooling systems were reclassified as a(2), based entirely on the change in the performance criteria. The licensee used the same Electric Power Research Institute guidance described above to justify the change for the system, even though the change was not consistent with the PSA. The licensee risk engineer indicated that performance criteria for several other systems had been changed in a similar manner.

The licensee indicated the reason for the performance criteria changes in unavailability were related to an increase in on-line maintenance activities for this and other systems. The inspectors were concerned that not only did the Electric Power Research Institute method seem to be inconsistent with the Regulatory Guide 1.160 guidance, but that the increase in on-line maintenance was a programmatic change that should be reflected in the PSA. Inspectors noted that the normal licensee process of updating the PSA based on 5 to 10 years of historical data would not adequately reflect the shift to increased unavailability for these systems due to increased on-line maintenance. After reviewing the practices for updating the PSA with licensee engineers, the inspectors found that PSA updates regarding system performance were not being made on a routine basis. Licensee procedures recommending a 2-year update of the PSA were in place for about 2 years, but an update had not been performed for some equipment since 1996. Inspectors noted that this information should be incorporated not only in the PSA, but also in the on-line risk monitoring tool the licensee used to meet the maintenance rule a(4) criteria. Following the inspectors' questions, the licensee began working on creating a timetable for a future update of the PSA which was expected within the next year.

The inspectors found that delays in incorporating equipment performance data on a timely basis, failure to make performance criteria consistent with PSA information, and failure to establish criteria for condition monitoring, could lead to inadequate assessment of maintenance performance. Failing to incorporate programmatic changes in the PSA and other risk tools such as the on-line maintenance risk tool could have an adverse affect on risk informed decisions. This overall issue was considered of more than minor significance because if left uncorrected, the failure to properly monitor the effectiveness of maintenance could become a more significant safety concern. One breaker failure had occurred but had not caused the safety bus which it supported to become inoperable. Therefore the significance of this condition monitoring and performance criteria concern was considered very low in the SDP. Although the performance criteria of the reactor core isolation cooling system was increased beyond that supported by the PSA, the actual increased unavailability of the reactor core isolation cooling system was not yet beyond what was supported by the PSA. Therefore the actual risk impact on the plant from the increased performance criteria for reactor core isolation cooling was very low. The combined effects of multiple system, structure and component performance criteria not being consistent with the PSA, of not updating the PSA for equipment performance since 1996, and of not establishing condition monitoring criteria could not be determined by the SDP. This issue was discussed in a Maintenance Rule board on April 19, 2001, and was recommended for further review to determine significance by risk analysts. This issue is considered to be **Unresolved Item 50-254/01-05-02; 50-265/01-05-02** pending a risk determination from that review.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed the licensee's evaluation of plant risk for planned maintenance activities on the 1A loop of the Unit 1 residual heat removal system and for a planned 3 day maintenance outage on Unit 2. The Unit 2 work included replacement of both reactor recirculation pump seals, repairing a leak on a feedwater check valve in the drywell, repairing a source range monitor channel, repairing an intermediate range monitor channel, and the replacement of numerous electro-hydraulic system solenoid operated valves.

During this inspection, the inspectors assessed the operability of redundant train equipment and verified that the licensee's planning of the maintenance activities minimized the length of time that the plant was subject to increased risk. The inspectors verified that emergent plant conditions were considered for risk by the licensee. The inspectors also interviewed operations, engineering, and work control department personnel and reviewed Nuclear Station Procedure WC-AA-103, "On-Line Maintenance," Revision 3.

In addition, the inspectors reviewed Condition Report Q2001-00833 to verify that identified problems were being entered into the program, appropriately characterized, and considered for effect on the plants risk profile.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events (71111.14)

a. Inspection Scope

The inspectors reviewed operator logs; plant computer data; strip chart recorder traces; Quad Cities Abnormal Operating Procedure (QCOA) 3500-01, "Feedwater Temperature Reduction with Main Turbine On Line," Revision 14; Condition Report Q2001-00937, "Unit 2 Feedwater Heater Trip"; Prompt Investigation Report for Condition Report Q2001-00937; and Docket No. 50-265, "Exelon Generation Company, LLC and Mid American Energy Company Facility Operating License." The inspectors discussed the event with operators, station management, and the Illinois Department of Nuclear Safety inspector.

b. Findings

On March 23, 2001, an operator-induced feedwater heating transient occurred on Unit 2, and resulted in a 33 degree decrease in feedwater inlet temperature. This temperature decrease added sufficient positive reactivity to increase reactor thermal power to 2578 megawatts, approximately 102.7 percent of maximum licensed power. The inspectors concluded that one Non-Cited Violation of NRC requirements occurred with very low safety significance (Green).

At approximately 8:57 a.m., a non-licensed operator in communication with the control room and under the supervision of the field supervisor adjusted the control air pressure to the 2B1 heater normal level controller in order to cause a slow rate of change in the heater level. Initially, the heater level responded as expected, but then both the normal and emergency level controller levels began to oscillate. The sequence of events recorder printout indicated that between 0859:01 and 0900:08 the 2B1, 2C1, and 2D1 heaters tripped within about 3 minutes of the start of the maintenance. In response to the heater trips, the feedwater temperature decreased 10 degrees within 1 minute of when the heater trips began.

The inspectors discussed the event with the Illinois Department of Nuclear Safety inspector who was in the control room at the time of the event. The nuclear station operators immediately addressed the heater alarms and referred to the appropriate annunciator response procedure. The operators failed to immediately recognize the reduction in feedwater heating and effectively control the increasing reactor power. Operators focused on the excessive power condition several minutes later, and after the Illinois Department of Nuclear Safety inspector questioned operators concerning an indication of increased electric output on the control board. At 09:03, operators reduced recirculation flow by 6 percent and inserted control rods, effectively reducing the excessive power. The overall transient resulted in a 33 degree decrease in feedwater inlet temperature. This temperature decrease added sufficient positive reactivity to increase reactor thermal power from 2511 to 2578 megawatts, approximately 102.7 percent of maximum licensed power.

The licensee's prompt investigation of the event identified several weaknesses in preparation for the evolution. For example, the nuclear station operator performing the pre-job briefing did not use a briefing check list, did not review worse case potential consequences of the maintenance, and did not review QCOA 3500-01 for the case in which a feedwater heater trip did occur. Additionally, the unit supervisor was relieved by the work execution supervisor with the feedwater heater evolution in progress in order to attend a pre-job brief for another unrelated evolution. The work execution supervisor received a turnover from the unit supervisor but did not attend the briefing for the feedwater heater evolution.

The inspectors reviewed the significance of this event and determined that the issue was more than a minor issue because it had an actual impact on safety by causing a short uncontrolled increase in reactor power above the maximum licensed power. Additionally, the inspectors determined that the resulting conditions from this event could have caused an initiating event and therefore should be evaluated for risk significance by the SDP. The inspectors, with assistance of the regional senior reactor analyst, screened the issue

and determined the risk significance of this event to be very low (Green) due to the relatively small increase a 2.7 percent power change would have had on overall core thermal limits. This was also the conclusion drawn from a preliminary review of the effects of a new licensee proposal for a power uprate of greater than 10 percent.

The inspectors reviewed the sequence-of-events recorder data printout of reactor thermal power for the duration of the event. The maximum thermal power during the event reached 2578 megawatts thermal. Quad Cities License DPR-30, Section 3.A, states, "Exelon Generation Company is authorized to operate Unit 2 at power levels not in excess of 2511 megawatts thermal." The failure to meet this license condition was considered a **Non-Cited Violation (50-265/01-05-03)**. The licensee entered the event into the corrective action program with Condition Report Q2001-00937. In addition, the licensee planned to perform a root cause analysis of this event.

#### 1R16 Operator Work-Arounds

##### a. Inspection Scope

The inspectors reviewed the following documents during a semiannual cumulative review of operator work-arounds:

- Open Operator Work Arounds and Operator Challenges List Dated February 23, 2001
- Closed Operator Work Around Report Dated February 23, 2001
- Operator Burden Review Quarterly Report Dated January 22, 2001
- Nuclear Station Operator Turnover Checklists for Unit 1 and 2 dated March 1, 2001

The inspectors evaluated the effects of the previously existing and new operator work arounds and operator challenges since the last semi-annual review. Inspectors also interviewed operators and toured plant areas, including the control room, to look for equipment that was degraded but not considered on the work-around list. Inspectors also reviewed condition reports which referred to operator work arounds.

##### b. Observations and Findings

No findings of significance were identified.

#### 1R19 Post Maintenance Testing

##### a. Inspection Scope

The inspectors selected post maintenance testing activities associated with mitigating or barrier integrity systems that were risk significant in the licensee's risk analysis. The inspectors evaluated the licensee's post maintenance testing activities for maintenance activities conducted on the following systems:

- Unit 1 Control Rod Hydraulic System
- Unit 1 High Pressure Coolant Injection System

- Unit 1 Reactor Core Isolation Cooling System
- Unit 2 Turbine Electro-hydraulic Control System
- Unit 2 Emergency Diesel Generator Fuel Oil System
- Unit 2 Emergency Diesel Generator
- Unit 2 2a and 2b Reactor Recirculation System
- Unit 2 Feedwater System

The inspectors reviewed work request packages for the selected maintenance activities in order to understand the scope of the work performed. A listing of work requests and surveillance test procedures reviewed by the inspectors is included in the list of documents reviewed section at the end of this report.

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified post maintenance testing. The inspectors verified that the post maintenance tests were performed in accordance with approved instructions or procedures, that the prerequisites described in the procedures were met, that the instructions or procedures clearly stated acceptance criteria, and that the acceptance criteria were met. The inspectors verified that appropriate test equipment was used for the testing, the test equipment was calibrated, and the test equipment was removed on the completion of the tests. When used, the inspectors verified the proper control of jumpers.

The inspectors interviewed operations, maintenance, and engineering department personnel and reviewed the completed post maintenance testing documentation in the associated work requests or in applicable surveillance test procedures.

Additionally, the inspectors verified that the performance of testing had been coordinated with operations, the effect of the testing had been evaluated on the plant, and that the proper equipment configuration was established by operators following the post maintenance test completion.

The inspectors reviewed the issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for the issues documented in the following condition reports:

- Q2000-01232            High Pressure Coolant Injection Turbine Turning Gear Disengaged During QCOS 2300-05
- Q2000-03000            High Pressure Coolant Injection Turning Gear Solenoid Not Wired per Design
- Q2001-00636            Slow Control Rods During Scram Timing

b. Findings

No findings of significance were identified.



## 1R22 Surveillance Testing

### .1 Unit ½ Diesel Generator Test

#### a. Inspection Scope

On February 16, 2001, the inspectors evaluated Quad Cities Operating Surveillance (QCOS) 6600-20, "Diesel Generator Endurance and Margin/Full Load Reject/Hot Restart Test," Revision 22, to verify that the testing demonstrated that the ½ emergency diesel generator was capable of performing its intended function. During the inspection, the inspectors interviewed operations and engineering department personnel, reviewed the completed test documentation and applicable portions of the Updated Final Safety Analysis Report and the Technical Specifications, and observed the performance of portions of the surveillance test.

In addition, the inspectors reviewed the issues that the licensee entered into the corrective action program and verified that identified problems were being appropriately characterized for significance. The inspectors also reviewed the licensee's corrective actions for the issues documented in the following condition reports:

- Q2001-00940, Identified Concerns with Calculation QDC-6600-E-0949
- Q2001-00954, Identified Concerns with Calculation QDC-6600-S-0722

#### b. Findings

No findings of significance were identified.

### .2 Reactor Core Isolation Cooling Manual Initiation Surveillance Test Observation

#### a. Inspection Scope

The inspectors observed performance of QCOS 1300-07, "RCIC Manual Initiation Test," for the Unit 1 reactor core isolation cooling system, to verify the acceptance criteria of delivering 400 gpm within 30 seconds was met, and to verify the performance of the contaminated condensate storage tank test bypass valve (1-1301-53) was satisfactory following maintenance. Inspectors observed the testing from both the control room and at the reactor core isolation cooling turbine.

#### b. Findings

No findings of significance were identified.

### .3 Units 1 and 2 Emergency Diesel Generator Timed Test Preconditioning Concerns

#### a. Inspection Scope

On March 9, 2001, the inspectors evaluated QCOS 6600-20, "Unit 2 Diesel Generator Semi-Annual Timed Start Test," to verify the testing demonstrated that the Unit 2 emergency diesel generator was capable of reaching rated voltage and frequency in less than or equal to 10 seconds. During the inspection, the inspectors interviewed operations and engineering department personnel, reviewed the completed test documentation, Section 8.3.1.6.5 of the Updated Final Safety Analysis Report and the Technical Specifications, and observed the performance of portions of the surveillance test. The inspectors also reviewed the licensee's response to Generic Letter 84-15, "Proposed Staff Actions to Improve And Maintain Diesel Generator Reliability," and NRC Inspection Manual Chapter 9900 Technical Guidance titled, "Maintenance-Preconditioning of Structures, Systems and Components Before Determining Operability."

The inspectors also reviewed the licensee's corrective actions for the issues documented in the following condition reports:

- Q2001-01007, Emergency Diesel Generator Timed Start Test Preconditioning
- Q2001-00771, Unit 2 Emergency Diesel Generator Air Start Motor Unusual Noise

#### b. Findings

The inspectors identified that on two occasions, March 9 and March 27, the licensee performed surveillance testing involving timing of the Unit 1 and Unit 2 emergency diesel generators shortly after the engines had been shut down from previous runs. Station procedures were inadequate in prescribing the performance of the tests. The procedures did not prevent preconditioning of the air start systems, fuel systems, and other engine and electrical components. The use of inadequate procedures for testing was considered a Non-Cited Violation of 10 CFR Appendix B, Criterion XI, "Test Control," which requires that operational test procedures ensure the testing is performed under suitable conditions. The risk significance was very low (Green) because inspectors determined that testing practices had not led to declining performance of the diesel generators.

Prior to the start of a semi-annual timed start test required by Technical Specifications for Unit 2, the inspectors observed conditions of the emergency diesel generator. System components such as lubricating oil and jacket water piping were hot to the touch, and the cylinder covers were too hot to touch, indicating a significant amount of engine heat remained from the previous run about 2½ hours before. The inspectors observed operators looking for acceptable locations to determine jacket water temperature and lube oil temperature to meet the requirements of QCOS 6600-45, "Unit 2 Diesel Generator Semi-Annual Timed Start Test," Revision 2. The procedure used the following criteria to establish that the diesel was in normal standby and not preconditioned: jacket water temperature less than 155 degrees Fahrenheit (°F) and circulating lube oil temperatures less than 150 °F or the emergency diesel generator has been at rest for

greater than 12 hours. The jacket water temperatures recorded were on a run of piping in which there was no forced flow. The oil temperature recorded was on an oil cooler outlet indicator which was not necessarily representative of internal engine temperatures. The recorded water and oil temperatures were about 30 to 40 degrees higher than normal diesel generator at rest temperatures. The licensee performed the surveillance test and found the start time to be longer than normal because of degraded air start motor performance, but still acceptable.

The inspectors found that the criteria used to prevent preconditioning did not eliminate the preconditioning concern for several reasons. The primary concern was that components such as air start motors, fuel racks, relays, solenoid valves, air operated valves and other moving components were exercised and potentially lubricated prior to the start of the test. Information Notice 97-16, "Preconditioning of Plant Structures, Systems, and Components Before ASME Code Inservice Testing or Technical Specification Surveillance Testing," and Inspection Manual Chapter 9900 described certain unacceptable conditions of preconditioning including running major equipment prior to a surveillance test without adequate time to allow systems to settle to normal standby conditions. The inspectors referred the licensee to the manual chapter and other referenced guidance following the surveillance test. The licensee acknowledged that no other procedural or process means were in place to ensure exercising of components did not constitute preconditioning for the emergency diesel generators. Subsequently, on March 27, the licensee ran the Unit 1 emergency diesel generator for monthly testing, then followed that test with a timed test required by Technical specifications using QCOS 6600-44, "Unit 1 Diesel Generator Timed Start Test," Revision 3. Once again, the inspectors found that the approximate 3½ hours between the first run and the timed test, along with the same oil and water temperature criteria used in the Unit 2 procedure did not ensure that the test was not adversely affected by preconditioning of components.

In the licensee's response to Generic Letter 84-15, "Proposed Staff Actions to Improve And Maintain Diesel Generator Reliability," the inspectors found the following response regarding the performance of surveillance testing including cold start testing: "Although the number of required diesel generator starts will be reduced, fast cold start capability testing will not be totally eliminated. Technical Specification 4.9.E.2.A and 4.9.E.b, which require simulated emergency auto-starts of diesel generators, will remain unchanged. To reduce excessive engine wear, surveillances which require routine diesel generator operability testing (i.e., monthly operability and/or post-maintenance surveillance) will incorporate the 90 second warm-up period into the surveillance procedure. All other requirements for the surveillance will remain unchanged. This will sufficiently demonstrate the diesel generator's ability to start and load." The inspectors found that the Technical Specification surveillances referred to in the generic letter response included the testing of the emergency diesel generator capability to start and load emergency bus loads and permit load shedding. Quad Cities Operating Surveillance (QCOS) 6600-38, "Unit One Emergency Core Cooling System Simulated Automatic Actuation and Diesel Generators Auto-start Surveillance," was one of the surveillance procedures used to meet the Technical Specification surveillance. However, the licensee informed the inspectors that this and other emergency diesel generator surveillances were changed in 1999 to allow the testing to occur following a previous test.

The inspectors reviewed the risk considerations. Previously run semi-annual surveillance testing would still be valid to consider the Unit 1 and Unit 2 emergency diesel generators operable until May 22 and May 9, 2001, respectively. Since no equipment performance issue was identified, the issue was screened out as very low risk significance. However, the inspectors determined that if the practice continued there would be a credible impact on safety because the ability of the emergency diesel generators to perform from at-rest conditions would not be assessed. Therefore, this issue was considered a Green finding. The use of inadequate procedures for testing was considered a **Non-Cited Violation (50-254/01-05-04; 50-265/01-05-04)** of 10 CFR, Appendix B, Criterion V, "Instructions, Procedures and Drawings," which states that, "Activities affecting quality shall be prescribed by documented procedures appropriate to the circumstances." Following the exit meeting, the licensee wrote Condition Report Q2001-01007 to document the problem and review corrective actions.

#### 1R23 Temporary Plant Modifications

##### a. Inspection Scope

The inspectors performed inspection walkdowns of the plant, reviewed administrative procedure CC-AA-112, "Temporary Modifications," and reviewed the modifications listed in the temporary modification tracking log to ensure temporary modifications were being adequately controlled.

When discrepancies from the station procedure were noted on items such as emergency lighting temporary installations, control room equipment not properly abandoned in place, and camera installations, the inspector reviewed the applicable information with design engineers to ensure requirements of design criteria and station procedures were met.

##### b. Issues and Findings

No findings of significance were identified.

#### **Emergency Preparedness (EP)**

#### 1EP1 Drill, Exercise, and Actual Events (71114.01)

##### a. Inspection Scope

The inspectors observed crew performances at the simulator on March 15, 2001, and reviewed the classification and notifications simulated during two different simulated emergencies with two different senior reactor operators in the shift manager position.

##### b. Findings

No findings of significance were identified.

### 3. SAFEGUARDS

#### 3PP4 Security Plan Changes (71130.04)

##### a. Inspection Scope

The inspector reviewed Revision 52 to the Quad Cities Nuclear Power Station Security Plan, Security Personnel Training and Qualification Plan, and Safeguards Contingency Plan. The referenced revision was submitted in accordance with regulatory requirements by licensee letter dated March 9, 2001.

##### b. Findings

No findings of significance were identified.

### 4. OTHER ACTIVITIES (OA)

#### 4OA3 Event Follow-up (71153)

##### .1 Review of Licensee Event Reports

##### a. Inspection Scope

The inspectors performed an onsite review of records to evaluate root causes and corrective actions for issues identified in licensee event reports, discussed in the Findings Section below, using Inspection Procedure 71153, "Event Follow-up."

For issues described in the licensee event reports, the inspectors evaluated the timeliness, completeness, and adequacy of corrective actions in accordance with requirements of 10 CFR Part 50, Appendix B, Criterion XVI.

##### b. Findings

(Closed) Licensee Event Report 50-254/98005-00: Failure to Complete Periodic Visual Inspection for Reactor Coolant Sources Outside Primary Containment, as Required by Technical Specifications. This issue involved failure to periodically inspect systems which may contain radioactive fluid outside containment and represented a noncompliance with Technical Specification 6.8.D.1.a requirements. The licensee maintained leakage from these systems as low as practical by various other station programs such as the operations department general area inspections and maintenance department housekeeping system walkdowns. This issue constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. The licensee entered this issue into the corrective action system in Q1998-00240, Q1996-2561, and NTS 254-200-96-18202. The inspectors reviewed the licensee's root cause and corrective actions to determine if they appeared reasonable. No findings of significance were identified. This issue is closed.

(Closed) Licensee Event Report 50-254/98014-00: The required American Society of Mechanical Engineers Section XI Code examinations for feedwater nozzles were not conducted during the second 10 year interval due to inadequate inservice inspection processes. This issue involved failure to perform a nondestructive examination on two feedwater nozzles in the required code interval and represented a non-compliance with Technical Specification 4.0.E. These nozzles were subsequently examined during the next code interval and found to be acceptable. This issue constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy. The licensee entered this issue into the corrective action system in Q1998-0154. The inspectors reviewed the licensee's root cause and corrective actions to determine if they appeared reasonable. No findings of significance were identified. This issue is closed.

(Closed) Licensee Event Report 50-265/97015-01: Multiple reactor vessel tests (Leakage and Inspection) were inadequate. The licensee entered this issue into the corrective action system in Q1997-03694, Q1997-04228, Q1997-04266, Q1997-04282, Q1997-04284, Q1997-4295, Q1997-04319, Q1998-0052, and Q1998-00138. This licensee event report is associated with the Code Section XI pressure testing and inspection issues identified in the cited violations closed in report Section 4OA5. The apparent causes included; lack of a process to track changes to NRC regulations, lack of a questioning attitude and safety focus, and lack of management oversight in this area. The licensee's corrective actions for these causes were reviewed by the inspector during closure of the cited violations discussed in report Section 4OA5 and no findings of significance were identified. This issue was not screened for risk significance, because it occurred prior to implementation of the NRC's revised oversight process. This issue is closed.

(Closed) Licensee Event Report 50-254/1996-015-00: High pressure coolant injection system jet impingement support baseplate concrete expansion anchors improperly installed. The issue involved licensee discovery of concrete expansion anchors tack welded instead of properly installed. The licensee corrected the original problem. An additional problem discovered during inspector review of the licensee event report was covered by (open) Inspection Follow-up Item (IFI) 96011-06. The licensee event report is closed and the additional issue will continue to be tracked by the IFI.

#### 4OA5 Other (92903)

##### .1 Review of Open Items

##### a. Inspection Scope

The inspectors performed an onsite review of records to evaluate corrective actions for the cited violations and an unresolved item discussed in the Findings Section below, using Inspection Procedure 92903, "Followup Engineering."

For cited violations, the inspectors evaluated the timeliness, completeness and adequacy of corrective actions in accordance with requirements of 10 CFR Part 50, Appendix B, Criterion XVI.

For the unresolved item, the inspectors evaluated the quality and level of effort expended to resolve the issue in accordance with requirements of 10 CFR Part 50, Appendix B, Criterion XVI.

b. Findings

(Closed) Violation (50-265/01013-1997591), (EEI 50-265/97-27-01): This violation involved failure to complete a Unit 2 Code Class 1 leakage test prior to criticality. The causes included; lack of a process to track changes to NRC regulations, lack of a questioning attitude and safety focus, and lack of management oversight in this area. The corrective actions for this issue were appropriate and timely. No findings of significance were identified. This issue is closed.

(Closed) Violation (50-265/01023-1997591), (EEI 50-265/97-27-06): This violation involved failure to perform an adequate 10 CFR 50.59 safety evaluation for the Unit 2 Code Class 1 leakage test performed after criticality. The causes included; lack of a process to track changes to NRC regulations, lack of a questioning attitude and safety focus, and lack of management oversight in this area. The corrective actions for this issue were appropriate and timely. No findings of significance were identified. This issue is closed.

(Closed) Violation (50-265/02013-1997591), (50-265/02033-1997591), (50-254/02043-1997591), (50-254/02053-1997591), (50-265/02063-1997591), (EEI 50-254/97-27-03; EEI 50-265/97-27-03): This violation involved five examples of failure to complete adequate Code leakage tests. The causes included; lack of a process to track changes to NRC regulations, lack of a questioning attitude and safety focus, and lack of management oversight in this area. The corrective actions for this issue were appropriate and timely. No findings of significance were identified. This issue is closed.

(Closed) Violation (50-265/02023-1997591), (EEI 50-265/97-28-07): This violation involved failure to meet Code VT-2 examination requirements for the Class 1 system associated with abbreviated examinations performed in 1997, on Unit 2. The causes for this issue included; lack of a process to track changes to NRC regulations, lack of a questioning attitude and safety focus, and lack of management oversight in this area. The corrective actions for this issue were appropriate and timely. No findings of significance were identified. This issue is closed.

(Closed) Violation (50-254/97-27-04; 50-265/97-27-04): This violation involved failure to maintain retrievable records of Code pressure tests. The cause was personnel error and corrective actions for this issue were appropriate and timely. No findings of significance were identified. This issue is closed.

(Closed) Violation (50-254/97-27-05): This violation involved failure to promptly implement the corrective action process for the failed Unit 1 vessel head flange inner O-ring seal. The cause was lack of personnel sensitivity to the alarm that indicated failure of the vessel head flange O-ring and corrective actions for this issue were appropriate. No findings of significance were identified. This issue is closed.

(Closed) Violation (50-254/98-21-01; 50-265/98-21-01): This violation involved multiple examples of failure to request relief from the ASME Code Section XI examination requirements when these requirements were not met. The cause was failure to correctly interpret the applicable NRC requirements and corrective actions for this issue were appropriate and timely. No findings of significance were identified. This issue is closed.

(Closed) Unresolved Item (50-254/97-18-02; 50-265/97-18-02): This unresolved item involved exclusion of the atmospheric containment atmosphere dilution system and containment atmosphere monitor system from the Inservice Inspection Program. For these systems the licensee determined that requirements of Regulatory Guide 1.26 for exclusion from Inservice Inspection Quality Group C were met, based on evaluation of the dose consequence from a postulated system failure. Additional actions completed by the licensee included disconnecting the atmospheric containment atmosphere dilution system, and controlling portions of the containment atmosphere monitor system associated with the containment boundary in accordance with the Inservice Inspection Program for Class MC components. These actions appeared reasonable, and no findings of significance were identified. This issue is closed.

.2 Licensee Strike Contingency Plans (92709)

a. Inspection Scope

On March 31, 2001, the local International Brotherhood of Electrical Workers (IBEW) union contract with ComEd expired. Because negotiations between the union and Exelon (ComEd) management indicated that an agreement was not likely prior to expiration of the contract, the NRC conducted an inspection to evaluate the licensee's strike contingency plans.

The inspectors evaluated the licensee's strike contingency plan. In particular, the inspectors verified that in the unlikely event of a strike, the licensee's strike contingency plan ensured that personnel were sufficient in number and qualifications to maintain the safe operation of the facility, including implementation of the site emergency plan. The inspectors performed inspections to verify that in the areas of plant management, operations, maintenance, security, chemistry, radiation protection, and administrative controls, strike contingency personnel met all qualification requirements and were proficient.

The inspectors reviewed the licensee's safeguards contingency plan in order to verify that the equipment and personnel required by the plan would be available and sufficient to ensure that reactor operation and facility security would be maintained.

The inspectors performed inspections to verify that support from local agencies would be adequate to ensure unimpeded access of strike contingency workers, medical care services, local fire department services, and support goods.

b. Findings

The inspectors found that the overall plan for strike contingencies was acceptable, although not completely implemented since an actual strike was not in progress. Some



issues regarding the ability of licensees to perform normal maintenance activities were present. Supervisors qualified to perform maintenance activities for strike contingencies were not required to meet the same requirements for proficiency as supervisors in the normal maintenance "systematic approach to training" process. Requirements to waive training based on experience were similar for both processes. However, waivers for actually demonstrating proficiency in a particular skill were given for supervisors qualifying in the strike contingency process. The licensee relied on an interview process to assess supervisor skills, and planned to supplement some skill weaknesses with just-in-time training prior to maintenance activities. No supervisors actually performed work using the skills they were qualified for in the strike contingency process. Therefore actual proficiency of the supervisors was not assessed.

Additionally, some supervisors scheduled for strike contingency emergency plan positions in maintenance were not qualified to use a respirator. After discussing this with station management, the licensee was able to change the planned positions for maintenance supervisors such that those needing to go into the plant during an emergency would be respirator qualified. No findings of significance were identified.

#### 4OA6 Meetings

##### .1 Inspection Period Exit Meeting

The inspectors presented the final inspection results to Mr. Tulon and other members of licensee management at the conclusion of the inspection on March 30, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

##### .2 Interim Exit Meeting

Senior Official at Exit:	T. Tulon
Date:	March 21, 2001
Proprietary Information:	None
Subject:	Review of Licensee Event Reports and NRC Open items

##### .3 Exit Meeting Summary

Senior Official at Exit:	G. Barnes
Date:	March 22, 2001
Proprietary Information:	None
Subject:	Biennial Heat Sink

## KEY POINTS OF CONTACT

### Licensee

T. Tulon, Site Vice President  
W. Beck, Regulatory Assurance Manager  
G. Boerschig, Engineering Manager  
R. Chrzanowski, Nuclear Oversight Manager  
M. Karney, Manager, Nuclear Security, Midwest Regional Operating Group  
M. McDowell, Operations Manager  
M. Perito, Maintenance Manager

### NRC

M. Ring, Chief, Projects Branch 1

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-254/01-05-01; 50-265/01-05-01	URI	Ultimate Heat Sink Performance Following Lock and Dam 14 Failure
50-254/01-05-02; 50-265/01-05-02	URI	Maintenance Rule Practices for Performance Criteria, Condition Monitoring Criteria, and PSA Updates
50-265/01-05-03	NCV	Failure to Meet License Condition
50-254/01-05-04; 50-265/01-05-04	NCV	Inadequate Procedure for Testing

### Closed

50-254/98005-00	LER	Failure to Complete Periodic Visual Inspection for Reactor Coolant Sources Outside Primary Containment, as Required by Technical specifications
50-254/98014-00	LER	The Required ASME Section XI Code Examination for Feedwater Nozzles were not Conducted during the Second Ten Year Interval due to Inadequate Inservice Inspection Processes
50-265/97015-01	LER	Multiple Reactor Vessel Tests (Leakage and Inspection) were Inadequate

50-254/96015-00	LER	High Pressure Coolant Injection Subsystem Jet Impingement Support Baseplate Concrete Expansion Anchors Improperly Installed
50-265/97-27-01 50-265/01013-1997591	EEI VIO	Failure to Complete a Unit 2 Code Class 1 Leakage Test Prior to Criticality
50-265/97-27-06 50-265/01023-199759	EEI	Failure to Perform an Adequate 10 CFR 50.59 Safety Evaluation for the Unit 2 Code Class 1 Leakage Test Performed after Criticality
50-254/97-27-03 50-265/97-27-03 50-265/01013-1997591, 50-265/02013-1997591 50-265/02033-1997591 50-254/02043-1997591 50-254/02053-1997591 50-265/02063-1997591	EEI EEI VIO VIO VIO VIO VIO VIO	Five Examples of Failure to Complete Adequate Code Leakage Tests
50-265/02023-1997591 50-265/97-28-07	VIO EEI	Failure to Meet Code VT-2 Examination Requirements for the Class 1 System Associated with Abbreviated Examinations Performed in 1997 on Unit 2
50-254/97-27-04 50-265/97-27-04	VIO	Failure to Maintain Retrievable Records of Code Pressure Tests
50-254/97-27-05	VIO	Failure to Promptly Implement the Corrective Action Process for the Failed Unit 1 Vessel Head Flange Inner O-ring Seal
50-254/98-21-01 50-265/98-21-01	VIO	Failure to Request Relief from the Asme Code Section XI Examination Requirements When These Requirements were not Met
50-254/97-18-02 50-265/97-18-02	URI	Exclusion of the Atmospheric Containment Atmosphere Dilution System and Containment Atmosphere Monitor System from the Inservice Inspection Program
50-265/01-05-03	NCV	Failure to Meet License Condition
50-254/01-05-04; 50-265/01-05-04	NCV	Inadequate Procedure for Testing

Discussed

None

## 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.

Inspection Procedure		Report Section
<u>Number</u>	<u>Title</u>	
71111-04	Equipment Alignment	1R04
71111-05	Fire Protection	1R05
71111-07	Heat Sink Performance	1R07
71111-11	Licensed Operator Requalification	1R11
71111-12	Maintenance Rule Implementation	1R12
71111-13	Maintenance Work Prioritization & Control	1R13
71111-14	Nonroutine Evolutions	1R14
71111-16	Operator Workarounds	1R16
71111-19	Post Maintenance Testing	1R19
71111-22	Surveillance Testing	1R22
71111-23	Temporary Plant Modifications	1R23
71114-01	Drill, Exercise, and Actual Events	1EP1
71130.04	Security Plan Changes	3PP4
71153	Event Follow-up	4OA3
92709	Other	4OA5
92903	Other	4OA5
(none)	Meetings, including Exit	4OA6

## LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
EI	Escalated Enforcement Item
EPRI	Electric Power Research Institute
IDNS	Illinois Department of Nuclear Safety
IFI	Inspection Follow-up Item
LER	Licensee Event Report
NRC	Nuclear Regulatory Commission
NUMARC	Nuclear Utilities Management and Resources Council
PSA	Probabilistic Safety Assessment
QCOA	Quad Cities Abnormal Operating Procedure
QCOS	Quad Cities Operating Surveillance
QCTS	Quad Cities Technical Surveillance
SDP	Significance Determination Process
URI	Unresolved Item
VIO	Violation
WR	Work Request

## LIST OF DOCUMENTS REVIEWED

### 1R19 Post Maintenance Testing

#### Unit 1 control rod hydraulic control unit work requests (WR)

- WR 990231060-01 Scram Inlet Valve Leakage on Hydraulic Control Unit 42-31
- WR 990200511-01 Replacement of Hydraulic Control Unit 54-43 Water Side Accumulator
- WR 990237625-02 Rebuild Scram Outlet Valve 1-0305-127-42-43
- WR 990237625-01 Adjust Valve Thrust on Scram Outlet Valve 1-0305-127-42-43

#### Unit 1 high pressure coolant injection turbine turning gear work request

- WR 990236470-01 Adjust High Pressure Coolant Injection Turbine Turning Gear Engagement

#### Unit 1 reactor core isolation cooling system work request

- WR 990228369-01 Installation of Four Rotor Motor on Unit 1 Reactor Core Isolation Cooling Minimum Flow Isolation Valve 1-1301-60

#### Unit 2 turbine electro-hydraulic control valve work requests

- WR 990252211-01 Replacement of Turbine Control Valve Fast Acting Solenoids
- WR 990199862-01 Replacement of Main Stop Valve Fast and Slow Acting Solenoids
- WR 990187956-01 Replacement of Servo Strainers on All 9 Bypass Valves
- WR 990194223-01 Install Step-up Transformer for Turbine Solenoid Valves
- WR 990224752-01 2A Master Trip Solenoid Replacement
- WR 990258593-01 2B Master Trip Solenoid Replacement

#### Unit 2 emergency diesel generator fuel oil work requests

- WR 990168413-01 Diesel Generator Fuel Oil Transfer Pump Discharge Valve Disassembly for Inspection
- WR 990111670-01 Motor Control Center 29-1 Fuel Oil Transfer Pump Breaker Cubical Inspection

#### Unit 2 emergency diesel generator work requests

- WR 990113835-01 Bus 24-1, Cubical 1 Unit 2 Diesel Generator Feed To Bus 24-1
- WR 990113214-01 Motor Control Center 29-1, Cubical G1 Unit2 Diesel Generator Room Heating, Ventilation, and Air Conditioning Supply, Normal Feed
- WR 990241731-01 Clean and Inspect Field Flash Circuit
- WR 990129607-01 Six Year Diesel Generator Electrical Inspection
- WR 990257585-01 Unit 2 Diesel Generator Time Delay Relay Calibration
- WR 98013141MM1 Unit 2 Diesel Generator 4 Year Inspection

Unit 2, 2A and 2B recirculating pump seal work requests

- WR 990214103-01A 2A Recirculating Pump Seal Removal and Replacement
- WR 990214102-01A 2B Recirculating Pump Seal Removal and Replacement

Unit 2 feedwater check valve, 2-0220-58B work request

- WR 990267927-01 Disassembly and Repair of 2-0220-58B

Unit 1 Control Rod Hydraulic Control Unit Surveillance Tests

- Quad Cities Technical Surveillance (QCTS) 0930-05, "Control Rod Scram Timing in the Hot Condition," Revision 18
- Quad Cities Operating Surveillance (QCOS) 0300-14, "Control Rod Drive Inoperable Outage Report," Revision 6

Unit 1 reactor core isolation cooling system surveillance tests

- QCOS 1300-06, "Reactor Core Isolation Cooling System Power Operated Valve Test," Revision 15
- QCOS 1300-07, "Reactor Core Isolation Cooling Manual Initiation Test," Revision 17
- QCOS 1300-011, "Reactor Core Isolation Cooling Valve Position Verification," Revision 8

Unit 2 turbine electro-hydraulic control valve surveillance tests

- QOS 5600-01, "Turbine Control Valve Fast Closure Scram Functional Test," Revision 22
- QOS 5600-02, "Turbine Stop Valve Closure Scram Instrumentation Test," Revision 18
- QOS 5600-04, "Weekly Turbine-Generator Tests," Revision 48
- QOS 5600-05, "Turbine Generator Periodic Testing," Revision 21

Unit 2 emergency diesel generator fuel oil surveillance test

- QCOS 6600-05, "Diesel Generator Fuel Oil Pump Flow Rate Test," Revision 9

Unit 2 emergency diesel generator surveillance tests

- QCOS 6600-42, "Unit 2 Diesel Generator Load Test," Revision 3
- QCOS 6600-45, "Unit 2 Diesel Generator Semi-annual Timed Start Test," Revision 2

4OA3 "Event Follow-up" and 4OA5 "Other"

M-642	Revision AC, "Diagram Of Atmospheric Containment Atmosphere Dilution System"
M-641	Revision AB, "Diagram of Containment Atmosphere Monitor System"
M-35	Revision AU, Diagram of Nuclear Boiler & Reactor Recirculation Piping"
Action	Request 0004319 formerly (NTS # 254-100-97-018202)

Q1996-01676	“Quad Cities Vessel Leak Test Procedure”
Q1997-03694	“Leak Test Done With Reactor Critical”
Q1997-04266	“VT2 Examination of the Reactor Flange”
Q1997-04228	“Reactor Pressure Vessel Flange VT-2”
Q1997-04295	“Missed VT-2 Examination of Reactor Head Seal Leak Detection System”
Q1997-04282	“NRC NOV for VT-2 Examination of Reactor Head Joint”
Q1997-04284	“NRC NOV for 50.59 Review of Unit 2 Leak Test”
Q1997-04319	“Unit 1 Reactor Vessel Head VT-2”
Q1998-00041	“Failure to Take Reactor Vessel Solid During Leak Test”
Q1998-00052	“NRC Unresolved Item, Regarding Adequacy of U2 VT-Inspection”
Q1998-00240	“Technical Specification Surveillance Exceeded Critical Date”
Q1998-00154	“Unit 1 and 2 Feedwater Nozzles N4B and N4C ASME Section XI, ISI”
Q1998-00138	“Inadequate VT-2 Inspection on Vessel and Drywell Piping”
Q2001-0894	“CAM Piping Exclusion From Class 3 of ISI Program”
LER 50-254/98005-00:	Failure to Complete Periodic Visual Inspection for Reactor Coolant Sources Outside Primary Containment, As Required by Technical Specifications
LER 50-254/98014-00:	The Required American Society for Mechanical Engineers (ASME) Section XI Code Examinations for Feedwater Nozzles were not Conducted during the Second Ten Year Interval due to Inadequate Inservice Inspection Processes
LER 50-265/98015-01:	Multiple Reactor Vessel Tests (Leakage and Inspection) were Inadequate
QCGP 1-1	“Normal Unit Startup,” Revision 37
QCTP 0820-08	“Leakage Reduction,” Revision 6
QCOP 0220-01	“Reactor Vessel Head Seal Leak Detection System,” Revision 10
ER-AA-330	“Conduct of Inservice Inspection Activities,” Revision 0
ER-AA-330-002	“Inservice Inspection of Welds and Components,” Revision 0
SPP VT-2-1	“VT-2 Visual Inspection Performed For Section XI,” Revision 7
SPP 2-1-0	“Certification of VT Examiners for ASME Section XI,” Revision 1
QCOS 0201-08	“Reactor Vessel and Class 1 Piping Leakage Test,” Revision 23
CC-AA-202	“Quality Review Team,” Revision 0
NDT-Z-1	“ASME Section XI Flaw Evaluation and Examination Volume Calculation,” Revision 2.
NOD-CA-98-003-JG	“ISI Program Assessment Quad Cities Unit 1 and 2, dated March 25, 1998

Inservice Inspection Program Assessment Report For Commonwealth Edison Company, Quad Cities Nuclear Plant Units 1&2, dated January 13, 1998

Letter NRC to Mr. Oliver Kingsley, President, Nuclear Generation Group Commonwealth Edison Company, “NRC Predecisional Enforcement Conference Summary,” dated January 23, 1998  
Letter NRC to Mr. Oliver Kingsley, President, Nuclear Generation Group Commonwealth Edison Company, “Notice of Violation and Proposed Imposition of Civil Penalties - \$330,000 (NRC Special Inspection Report Nos. 50-254(265)-97027),” dated March 12, 1998



- Letter NRC to Mr. Oliver Kingsley, President, Nuclear Generation Group Commonwealth Edison Company, "Notice of Violation (NRC Inspection Report 50-254/98021(DRS.); 50-265/98021(DRS.)), " dated May 11, 1999
- Letter SVP-98-133, from D. Sager Vice President, Quad Cities Station to the NRC, "Response to Notice of Violation and Proposed Imposition of Civil Penalty NRC Inspection Report Nos. 50-245/265-97027," dated April 13, 1998
- Letter SVP-98-010, from E.S. Kraft, Site Vice President, Quad Cities Station to the NRC, "NRC Inspection Report Numbers 50-254/97027 and 50-265/97027," dated January 21, 1998
- Letter SVP-99-063, from J. P. Dimmette, Site Vice President, Quad Cities Station to the NRC, "Reply to a Notice of Violation NRC Inspection Report Numbers 50-254/98021 and 50-265/98021," dated April 9, 1999
- Letter SVP-99-099, from J. P. Dimmette, Site Vice President, Quad Cities Station to the NRC, "Request for Inservice Inspection Program Relief Regarding Weld Examination Coverage for Second Inservice Inspection Program Interval," dated May 13, 1999
- Letter SVP-99-099, from J. P. Dimmette, Site Vice President, Quad Cities Station to the NRC, "Relief request CR-32, Inservice Inspection Program Relief Regarding Examination Coverage for the Third Inservice Inspection Program Interval," dated October 29, 1999

Updated Final Safety Analysis Report, Sections 5.2 and 5.3.  
Training Lesson Plan Module TRNESPT\JHVT.R0  
Internal Memorandum documenting VT-2 Training "Management Expectations," dated March 20, 2001.