October 15, 2001

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
Quad Cities Nuclear Power Station
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION - NRC INTEGRATED INSPECTION REPORT 50-254/01-14, 50-265/01-14

Dear Mr. Kingsley:

On September 30, 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 October 2, 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.

Based on the results of this inspection, the inspectors identified one issue of very low safety significance (GREEN). This issue was determined to involve a violation of NRC requirements. However, because of its very low safety significance and because it has been entered into your corrective action program, the NRC is treating this issue as a Non-Cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny this Non-Cited Violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-001; and the NRC Resident Inspector at the Quad Cities Nuclear Power Station.

Since September 11, 2001, Quad Cities has assumed a heightened level of security based on a series of threat advisories issued by the NRC. Although the NRC is not aware of any specific threat against nuclear facilities, the heightened level of security was recommended for all nuclear power plants and is being maintained due to the uncertainty about the possibility of additional terrorist attacks. The steps recommended by the NRC include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with local law enforcement and military authorities, and limited access of personnel and vehicles to the site.

The NRC continues to interact with the Intelligence Community and to communicate information to Exelon Nuclear. In addition, the NRC has monitored maintenance and other activities which could relate to the site's security posture.

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
Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 50-254/01-14; 50-265/01-14

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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:	50-254/01-14; 50-265/01-14
Licensee:	Exelon Nuclear
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	August 15 through September 30, 2001
Inspectors:	C. Miller, Senior Resident Inspector K. Stoedter, Senior Resident Inspector J. Adams, Resident Inspector J. Gavula, Regional Engineering Inspector M. Kurth, Resident Inspector - Duane Arnold P. Prescott, Senior Resident Inspector - Duane Arnold R. Walton, Operator Licensing Examiner
Approved by:	Mark Ring, Chief Branch 1 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000254-01-14, IR 05000265-01-14 on 08/15 - 09/30/2001, Exelon Nuclear, Quad Cities Nuclear Power Station, Units 1 & 2, Event Followup.

The inspection was conducted by resident and regional inspectors. This inspection identified one Green issue which involved one Non-Cited Violation. 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. On December 27, 2000, the licensee discovered that the high pressure coolant injection system was not filled with water from the pump discharge valve to the system isolation valve following maintenance activities. Technical Specification Surveillance Requirement 4.5.A.1.a.1 required the licensee to verify that the high pressure coolant injection system was filled with water every 31 days. The inspectors determined that greater than 31 days had elapsed since the licensee had verified that the high pressure coolant injection system was properly filled. The failure to perform the surveillance requirement within 31 days also resulted in the high pressure coolant injection system being inoperable for greater than the Technical Specification 3.5.A.3.a.3 allowed outage time of 14 days.

The failure to meet the requirements of Technical Specification 3.5.A.3.a.3 and Surveillance Requirement 4.5.A.1.a.1 was considered a Non-Cited Violation. The risk significance of this event was determined to be very low since all remaining mitigation systems were available to provide water to the reactor during an event (Section 4OA3.1).

Report Details

1. REACTOR SAFETY

Plant Status

Unit 1 operated at or near full power for the entire inspection period with the exception of minor power reductions to conduct required turbine valve testing.

Unit 2 began the inspection period shut down due to the failure of the main power transformer. On August 26, 2001, the licensee commenced Unit 2 startup activities following the transformer replacement. Full power conditions were achieved on August 28, 2001. Unit 2 operated at full power until September 8, 2001, when reactor power was reduced to approximately 30 percent for condenser waterbox inspections and identification of potential condenser tube leaks. Three tubes were plugged in the west waterbox. Following the waterbox inspections, Unit 2 operated at or near full power for the remainder of the inspection period.

1R04 Equipment Alignments (71111.04)

a. Inspection Scope

The inspectors verified the system alignment of the Unit 1 and Unit 2 emergency diesel generators and the Unit 2 essential services bus while redundant equipment was out of service for maintenance activities. The inspectors verified that the as-found system configuration and operating parameters supported the continued ability of the system to perform its intended functions. The inspectors accomplished the verifications by comparing the as-found configuration of the accessible portions of the diesel generators and the essential services bus to the configuration specified in the respective Quad Cities Operating Procedures. The inspectors reviewed design and licensing information and discussed system configuration and performance with licensee personnel.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors reviewed activities associated with the annual overhaul and capacity testing of the ½ B diesel fire pump. The inspectors verified that overhaul activities were consistent with information contained in the vendor manual and did not precondition the fire pump prior to the capacity test. Using Procedure QCMMS 4100-03, "½ B Diesel Driven Fire Pump Annual Capacity Test," Revision 10, the inspectors validated that the testing configuration met procedural requirements and engineering personnel were knowledgeable of the testing activities. The inspectors also reviewed the respective

National Fire Protection Association Codes to ensure that all code requirements related to testing and maintenance were included in the respective procedures.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

The inspectors observed the August 20, 2001, licensed operator simulator requalification scenario. The exercise scenario involved a control rod drive pump trip and control rod drive drift. Following the rod drift, the steam jet air ejectors failed closed which resulted in a loss of condenser vacuum. An anticipated transient without a scram condition occurred when the reactor failed to scram in response to the loss of condenser vacuum. Operations training personnel terminated the scenario when the operations crew had shutdown the reactor and established an appropriate cooldown condition.

The inspectors observed communications, procedural adherence, and implementation of emergency operating procedures. Event classification, shift supervisor oversight and direction, and the evaluators' critique were also observed. The inspectors verified that the operators properly completed all critical tasks during the scenario.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed the following risk significant systems associated with the Initiating Events, Mitigating Systems, and Barrier Integrity Cornerstones:

Unit	System	Maintenance Rule Function
1	Secondary Containment	Z0020
1	Electro-Hydraulic Control System	Z5650
2	Primary Containment Isolation	Z0010
2	Instrument Air System	Z4700
1 & 2	Emergency Diesel Generator	Z6600
1 & 2	Fire Protection	Z4100

The inspectors reviewed problems documented in the following condition reports for appropriate disposition with respect to the Maintenance Rule:

- Q2000-04262, “Both High Pressure Coolant Injection Interlock Doors Open at the Same Time”;
- Q2001-02113, “B Electro-Hydraulic Control Pump Failed to Develop Normal Discharge Pressure During an Auto Start”;
- Q2000-03762, “As-Found Local Leak Rate Failure on Reactor Core Isolation Cooling Turbine Exhaust Stop Check Valve”;
- Q2000-01635, “Unit 2 Instrument Air Compressor Trip”;
- Q2000-03413, ”U-2 Diesel Generator Possible Recrank During Start on 9/21/00"; and
- Q2001-02270, “½ B Diesel Fire Pump Failed Capacity Test.”

The inspectors reviewed the licensee’s implementation of the maintenance rule, including a review of scoping, performance criteria, performance monitoring, expert panel meeting minutes, short-term and long-term corrective actions, and current equipment performance status. The inspectors discussed system problems and maintenance rule classifications with engineering personnel.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the operability evaluation associated with the failure of the ½ B diesel fire pump to meet its operability curve and the need for an operability evaluation to address the possibility of air entrapment in the standby liquid control system pump suction piping during air sparging activities.

The inspectors reviewed the following documents associated with these issues:

- Problem Identification Form Q1999-02857, “Operability of SBLC [Standby Liquid Control] During Air Sparging”;
- Condition Report Q2001-02287, “Diesel Fire Pump B Failed to Meet Operability Curve”;
- Condition Report Q2001-02297, “½ B Diesel Fire Pump Failed to Meet its Operability Point”;
- Condition Report Q2001-02869, “SBLC Inoperable During Air Sparge Evolution”;
- Condition Report Q2001-02961, “Better Documentation of Engineering Judgement for SBLC Sparging Issue is Required”; and
- Supporting Operability Determination Documentation for Condition Report Q2001-02297.

The inspectors verified that operability evaluations were performed when required and that completed evaluations were technically adequate, justified continued operation,

considered other existing degraded conditions where applicable, and referenced applicable sections of the Updated Final Safety Analysis Report and other applicable design basis documentation. The inspectors discussed the problems identified in the referenced condition reports with licensee engineers.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed the installation of a permanent plant modification on the fuel oil transfer system for the ½ emergency diesel generator. The modification removed the normally closed fuel oil admission solenoid valve to the ½ emergency diesel generator day tank. The modification was performed to increase the reliability of the emergency diesel generator fuel oil transfer system.

The inspectors verified that modification preparation, staging, and implementation did not impair the ability to complete plant emergency and abnormal operating procedure actions if required, monitor key safety functions, or respond to a loss of key safety functions. The inspectors reviewed the design adequacy of the modification by verifying the following:

- replacement components were compatible with physical interfaces;
- replacement component properties met functional requirements under event and accident conditions;
- replacement components were environmentally and seismically qualified;
- affected operations procedures were revised and training needs were evaluated in accordance with station administrative procedures;
- revised flow paths met functional requirements under event and accident conditions; and
- process medium properties remained acceptable under event and accident conditions.

The inspectors also verified that the post modification testing demonstrated system operability by verifying no unintended system interactions occurred, system performance characteristics met the design basis, and post-modification testing results met all acceptance criteria.

The inspectors discussed the modification with station operators, electrical maintenance, and engineering personnel. The inspectors reviewed the following documentation during the course of this inspection:

- Design Change Package EC 332260;
- 50.59 Review for ECs 24578, 332259, and 332260;
- Work Order Package 00351150;

- Quad Cities Operating Surveillance Procedure 6600-03, “Diesel Fuel Oil Transfer Pump Monthly Operability,” Revision 13; and
- Condition Report Q2001-02806, “Safe Shutdown Required Equipment List Does Not Match Procedurally Required Equipment.”

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post-maintenance test data for the following activities:

- Corrective Work Order 99249561, “Repair Steam Leak on Drain Pot Where Level Switch is Located”;
- Corrective Work Order 00343367, “Bypass Valve Number 6 Failed to Open - Replace Servo Valve”;
- Corrective Work Order 99281324-01, “Transformer 2 Dew Point Stabilization Test”;
- Corrective Work Order 99281324-24, “Transformer 2 Thru Fault Testing”;
- Preventive Work Order 99195985, “MCC [Motor Control Center] 19-4 Cubicle A1 Drywell Spray Inboard Isolation Valve”; and
- Work Order Package 00351150-01, "Removal of the Solenoid Operator 0-5201 from the ½ Emergency Diesel Generator Fuel Oil Day Fill Line.”

The inspectors verified that the post-maintenance tests demonstrated that the systems and components were capable of performing their intended function. Included in the review were the applicable sections of Technical Specifications, the Updated Final Safety Analysis Report, and vendor manuals. Following the completion of the tests, the inspectors verified that test equipment was removed and that the equipment was returned to the proper configuration.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage (71111.20)

a. Inspection Scope

The inspectors observed the removal of the failed Unit 2 main power transformer and installation of the new transformer during Unit 2 Forced Outage 54. The inspectors monitored outage configuration management on a daily basis by verifying that the licensee maintained appropriate defense in depth to address all shutdown safety functions and satisfy Technical Specification requirements. Due to the large amount of work performed in and around the Unit 2 main power transformer, the inspectors closely monitored the availability of alternate electrical systems. Proper operation of the decay heat removal system was verified during multiple control room tours and observations. Between August 26 and 28, 2001, the inspectors observed multiple startup activities including the approach to criticality and synchronization to the electrical grid.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed surveillance testing activities and/or reviewed completed packages for the tests listed below related to systems in the Mitigating Systems and Barrier Integrity Cornerstones:

- QCOS 0700-06, “APRM [Average Power Range Monitor] Flow Biased High Flux Calibration Test,” Revision 20, on August 16, 2001.

- QCOS 6600-41, “Unit 1 Diesel Generator Load Test,” Revision 7, and QCOS 6600-02, “Diesel Generator Air Compressor Operability,” Revision 15, on September 11, 2001.

- QCOS 1000-06, “RHR [Residual Heat Removal] Pump/Loop Operability Test,” Revision 26, for Unit 1 “B” Loop on September 13, 2001.

- QCOS 1000-04, “RHR Service Water Pump Operability Test,” Revision 27, for Unit 1 “B” Loop on September 13, 2001.

- QCOS 1100-07, “SBLC Pump Flow Rate Test,” Revision 19, on September 14, 2001.

The inspectors verified that Technical Specifications, Updated Final Safety Analysis Report, and licensee’s procedure requirements were met during each testing evolution. Vibration and valve timing results were compared against In-Service Testing requirements for those components subject to the program. The inspectors also verified that the testing demonstrated that the structure, system, or component was capable of performing its intended safety functions.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Performance Indicator Verification (71151)

.1 Safety System Unavailability - High Pressure Coolant Injection and Reactor Core Isolation Cooling

a. Inspection Scope

The inspectors reviewed operator logs and short duration time clock entries to determine the total unavailability time for both units high pressure coolant injection and reactor core isolation cooling systems from the 4th quarter 2000 through the 1st quarter 2001. The inspectors compared their results with the licensee's unavailability performance indicator data submitted to the NRC.

b. Findings

The inspectors determined that the number of unavailable hours for both units high pressure injection systems and reactor core isolation cooling systems were satisfactorily tabulated by the licensee. The inspectors noted that there was an outstanding issue related to Unit 2 high pressure coolant injection unavailability based on inadequate venting of the discharge side of the pump. This could potentially change the published unavailability hours for the 4th quarter 2000 for the Unit 2 high pressure injection performance indicator. This issue was being reviewed by the NRC under Unresolved Item 50-254/01-08-02.

4OA3 Event Follow-up (71153)

.1 Review of Licensee Event Reports

a. Inspection Scope

The inspectors performed an onsite review of records to evaluate the root causes and corrective actions for issues identified in licensee event reports 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 50-254/00004-01: Failure of Control Room Emergency Ventilation Refrigeration Control Unit. On May 19, 2000, during the performance of monthly control room emergency filtration test, the safety-related control room ventilation refrigeration control unit tripped due to a loose local control switch cam follower retaining screw. This event was a repeat of a December 1999 event. Upon the repeat failure, the licensee performed further troubleshooting and determined that the cam follower for the control switch was defective. Based on the information available, the license determined that the cam follower was defective when installed; however, the root cause report did note that a rectangular hole in the cam follower had become rounded out over time. The licensee replaced the cam follower and planned on inspecting a random sample of other similar control switches as part of their corrective actions. The safety significance of this issue was very low since the filtration capability of the control room emergency ventilation was not lost, control room temperature was maintained during the event, and the A train (non-safety-related) of control room ventilation remained available throughout the event. The information provided in this licensee event report supplement did not identify any new issues or change the risk significance of this event. In addition, this event did not constitute a violation of NRC requirements.

(Closed) Licensee Event Report 50-265/00005-02: High Pressure Coolant Injection Inoperability During Low Pressure Testing Due To Incomplete Maintenance Activities and Inadequate Venting. On February 10, 2000, with Unit 2 at 150 psig during startup, the licensee attempted to start the high pressure coolant injection pump for a low pressure operability test. The pump did not start. A review of closed work packages performed on the high pressure coolant injection system revealed that work steps for the interlock dump valve were not completed during the outage. This event was entered in the licensee's corrective action program as Problem Identification Form Q2000-00742. The failure to complete the maintenance activity on this safety-related equipment in accordance with the work request was considered to be a violation of Technical Specifications and Regulatory Guide 1.33. A Non-Cited Violation was issued for this event in Inspection Report 50-254/200001; 50-265/200001. The Significance Determination Process determined the safety significance of this issue was very low (Green) since Unit 2 reactor pressure was low, decay heat was low, and redundant methods of inventory injection were either operating or available.

(Closed) Licensee Event Report 50-254/00007: Inadequate Fill and Vent Surveillance Performed on High Pressure Coolant Injection Resulting in Air in Discharge Piping. On December 27, 2000, with Unit 1 at full power, the licensee discovered that the filling of the high pressure coolant injection system had not been adequately verified since November 1, 2000. The licensee determined that a recent procedure revision had made the filling and venting of the pump independent of the filling and venting of the discharge piping. These changes were overlooked by the procedure performer. In addition, the procedural requirement to vent the high pressure coolant injection system discharge piping for 35 seconds did not account for a situation where air bubbles may be at an intermediate point in the system.

Technical Specification Surveillance Requirement 4.5.A.1.a.1 requires verification that the high pressure coolant injection system is filled with water from the pump discharge

valve to the system isolation valve every 31 days. Surveillance Requirement 4.0.C states that failure to perform a Surveillance Requirement within the allowed surveillance interval shall constitute noncompliance with the operability requirements of the Limiting Condition for Operation. Technical Specification Limiting Condition for Operation 3.5.A.3.a.3 states that the high pressure coolant injection system may be inoperable for up to 14 days provided the core spray, low pressure coolant injection, automatic depressurization, and reactor core isolation cooling systems are operable. The failure to verify an adequate fill of the high pressure coolant injection system such that the system remained operable was considered a **Non-Cited Violation (50-254/01-14-01)** of Technical Specification 3.5.A.3.a.3. This violation is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy. This event was entered into the licensee's corrective action program as Condition Report Q2000-04468.

The inspectors reviewed the risk significance of this issue and determined the issue was more than minor because if left uncorrected, the issue could become a more significant safety concern and credibly impact the operability of a mitigating system. The inspectors screened the issue using the Significance Determination Process and determined the risk significance of this issue to be very low (Green) due to the availability of all remaining mitigating systems if an actual event had occurred. The review regarding whether Unit 1 high pressure coolant injection system would have performed its safety function is ongoing as part of the resolution of Unresolved Item 50-254/01-08-02.

4OA6 Meetings

.1 Inspection Period Exit Meeting

The inspectors presented the inspection results to Mr. Tulon and other members of licensee management at the conclusion of the inspection on October 2, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Tulon, Site Vice President
G. Barnes, Plant Manager
D. Barker, Radiation Protection Manager
W. Beck, Regulatory Assurance Manager
G. Boerschig, Engineering Manager
R. Chrzanowski, Nuclear Oversight Manager
R. Gideon, Work Control Manager
K. Leech, Security Manager
M. McDowell, Operations Manager
K. Moser, Chemistry/Environ/Radwaste Manager
M. Perito, Maintenance Manager

NRC

M. Ring, Chief, Reactor Projects Branch 1

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-254/01-14-01	NCV	Failure to verify adequate fill of the high pressure coolant injection system as required by Technical Specifications

Closed

50-254/2000-004-01	LER	Trip of Safety Related Control Room Emergency Ventilation System
50-265/2000-005-02	LER	High Pressure Coolant Injection Inoperability During Low Pressure Testing
50-254/2000-007-00	LER	Inadequate Fill and Vent Surveillance Performed on High Pressure Coolant Injection
50-254/01-14-01	NCV	Failure to verify adequate fill of the high pressure coolant injection system as required by Technical Specifications

Discussed

None.

LIST OF ACRONYMS AND INITIALISMS USED

CFR	Code of Federal Regulations
IDNS	Illinois Department of Nuclear Safety
IFI	Inspection Follow-up Item
LER	Licensee Event Report
URI	Unresolved Item
VIO	Violation