October 28, 2002

Mr. John L. Skolds, 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 50-254/02-07; 50-265/02-07

Dear Mr. Kingsley:

On September 30, 2002, the Nuclear Regulatory Commission (NRC) completed an inspection at your Quad Cities Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on October 1, 2002, 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 four issues of very low safety significance (Green). Three of these 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 U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Quad Cities Station.

The NRC has increased security requirements at the Quad Cities Station in response to terrorist acts on September 11, 2001. Although the NRC is not aware of any specific threat against nuclear facilities, the NRC issued an Order and several threat advisories to commercial power reactors to strengthen licensees' capabilities and readiness to respond to a potential attack. The NRC continues to monitor overall security controls and will issue temporary instructions in the near future to verify by inspection the licensee's compliance with the Order and current security regulations.

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/reading-rm/adams.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 50-254/02-07;
50-265/02-07

cc w/encl: Site Vice President - Quad Cities Nuclear Power Station
Quad Cities Nuclear Power Station Plant Manager
Regulatory Assurance Manager - Quad Cities
Chief Operating Officer
Senior Vice President - Nuclear Services
Senior Vice President - Mid-West Regional
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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:	50-254/02-07; 50-265/02-07
Licensee:	Exelon Nuclear
Facility:	Quad Cities Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	July 1 through September 30, 2002
Inspectors:	K. Stoedter, Senior Resident Inspector M. Kurth, Resident Inspector D. Funk, Security Inspector R. Lerch, Project Engineer
Approved by:	Mark Ring, Chief Branch 1 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000254-02-07, 05000265-02-07; Exelon Generation Company, LLC; on 07/01-09/30/2002, Quad Cities Station; Units 1 & 2. Maintenance Effectiveness, Operability Evaluations, Identification and Resolution of Problems, and Event Follow-up.

This report covers a 3-month period of baseline resident inspection and an announced baseline inspection on physical security. The inspection was conducted by Region III inspectors and the resident inspectors. Four Green findings were identified. Three of these involved Severity Level IV Non-Cited Violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspection Findings

Cornerstone: Initiating Events

Green. The failure to consider the impact of new flow induced vibration failure mechanisms on the Unit 2 steam dryer as part of the extended power uprate analysis resulted in unexpected and unpredictable changes in reactor power, reactor vessel level, reactor pressure, and main steam line flow between June 7 and July 11, 2002. The licensee subsequently determined that the changes in Unit 2 operating parameters were caused by the failure of a Unit 2 steam dryer cover plate.

This finding was more than minor because the changes in Unit 2 operating parameters caused by the degraded dryer created conditions which increased the likelihood of a plant transient. However, this finding was of very low risk significance because the changes in plant parameters and the dryer failure did not contribute to the likelihood of a primary or secondary loss of coolant accident initiator, did not contribute to the likelihood of a reactor trip with mitigating equipment not available, and did not increase the likelihood of a fire or an internal or external flood. There were no violations of NRC requirements due to the steam dryer being non-safety related (Section 4OA3).

Cornerstone: Mitigating Systems

Green. Inadequate bearing fit-up measurement and motor lubrication instructions resulted in a self-revealing failure of the 1A core spray and reactor core isolation cooling room cooler fan inboard motor bearings and a Non-Cited Violation of Technical Specification 5.4.1.

The inspectors determined that this finding was more than minor because the improper bearing fit-up and lubrication instructions impacted the availability, reliability, and capability of equipment used to support risk significant mitigating equipment. The failure of the 1A core spray and reactor core isolation cooling room cooler was of low risk significance because the failure was not caused by a design or qualification deficiency,

did not result in an actual loss of safety function for the core spray or reactor core isolation cooling systems, and did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event (Section 1R12).

Green. Ineffective corrective actions resulted in repetitive failures of the 2A residual heat removal normal/alternate switch between June 1999 and September 2002 and a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI.

The failure to correct the multiple normal/alternate switch failures was more than minor because the switch failures impacted the availability, reliability, and capability of equipment used to respond to initiating events and prevent undesirable consequences from a plant fire. This finding was of very low risk significance because the switch failures did not result in an actual loss of function for the residual heat removal system. The switch failures also failed to screen as a risk significant fire issue because the room cooler was not needed until 52 hours after a fire which provided the licensee adequate time to correct the failure (Section 1R15.1).

Green. The licensee failed to follow procedural requirements regarding the initiation of condition reports and determining the extent of condition following the discovery of a large amount of grease in the 1A core spray room cooler motor. As a result, the licensee did not provide a basis for continued operability of potentially impacted plant motors for approximately 40 days.

This finding was more than minor because the licensee's lack of action resulted in the inability to ensure the availability and reliability of mitigating systems equipment used to respond to initiating events and prevent undesirable consequences. The inspectors determined that this finding was of very low risk significance because subsequent reviews determined that even if the motors susceptible to overgreasing failed, the motors are not credited in the licensee's probabilistic risk assessment (Section 4OA2.1).

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period operating at full power. Operations personnel reduced reactor power to 540 megawatts electric (MWe) on July 13 for a control rod pattern adjustment. Operators restored Unit 1 to full power on July 14. A packing leak on the high pressure coolant injection inlet steam admission valve forced operations personnel to shut down Unit 1 on August 2. Unit 1 returned to full power 5 days later. Additional power reductions and control rod pattern adjustments were conducted on August 10 and 17. In early September Unit 1 entered coastdown due to the existing control rod pattern. During this period reactor power steadily dropped to approximately 96 percent power. On September 7 operations personnel lowered reactor power to 66 percent, completed a control rod pattern adjustment, and returned the unit to full power. An additional control rod pattern adjustment was performed on September 21. On September 23 the licensee discovered a leaking high pressure feedwater heater relief valve which required a power reduction to repair. Operations personnel reduced reactor power to approximately 75 percent on September 28 to complete the repairs. The unit returned to full power later the same day. Unit 1 operated at full power for the remainder of the inspection period.

Unit 2 began the inspection period at reduced power due to experiencing multiple changes in reactor power, reactor vessel level, reactor pressure, main steam line flows, and turbine steam flow. On July 11 the licensee shut down Unit 2 to determine the cause of the changes in the reactor parameters listed above. The licensee identified that a dryer cover plate had failed. During the subsequent 10-day outage, the licensee repaired and modified the dryer to prevent a recurrent failure. Operations personnel synched the generator to the grid on July 21. Unit 2 returned to maximum achievable power on July 23. A leak on the 2B reactor feedpump discharge drain line caused operations personnel to reduce reactor power to 760 MWe on August 10 to complete repairs. Unit 2 returned to full power later the same day. Operators lowered reactor power to approximately 60 percent on September 15 to perform turbine valve testing and a control rod pattern adjustment. Unit 2 returned to full power on September 16 and remained at this power level for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignments (71111.04)

.1 Quarterly Equipment Alignments

a. Inspection Scope

The inspectors verified the system alignment of the following mitigating systems during the period:

- Unit 1 Reactor Core Isolation Cooling System;

- Unit 1 Emergency Diesel Generator; and
- Unit 2 Emergency Diesel Generator.

During the weeks of July 1, 15, and 22 of 2002, the inspectors performed partial walkdowns of accessible portions of trains of risk significant mitigating systems equipment during times when the trains were of increased importance due to redundant trains or other related equipment being unavailable. The inspectors used the valve checklists listed at the end of this report to verify that the components were properly positioned and that support systems were lined up as needed in accordance with station procedures. The inspectors also examined the material condition of the components and observed operating parameters to verify that there were no obvious deficiencies. The inspectors used the information in the appropriate sections of the Updated Final Safety Analysis Report to determine the functional requirements of the systems.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Equipment Alignment

a. Inspection Scope

During the week of August 5, the inspectors conducted a semi-annual equipment alignment of the turbine building closed cooling water system. This system was considered to be highly risk significant due to the large number of mitigating systems equipment it cools. The inspectors reviewed applicable procedures and drawings to determine the correct system lineup. The results of this review were used during a system walkdown to verify that valves were correctly positioned; electrical power was available; major system components were correctly labeled, lubricated, and cooled; hangers and supports were correctly installed and functional; and that valves were locked as required by procedure. The inspectors reviewed lists of outstanding maintenance work requests, engineering changes, and condition reports associated with the turbine building closed cooling water system to ensure that the deficiencies listed did not impact the ability of the system to perform its function. The inspectors also reviewed currently installed temporary modifications that impacted operation of the system to verify that the modifications were installed as required and processed in accordance with the licensee's procedures.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

During the inspection period, the inspectors conducted in-plant walkdowns of the following risk-significant fire zones to identify any fire protection degradations:

- Fire Zone 1.1.2.2 Unit 2 Reactor Building Ground Floor;
- Fire Zone 1.1.2.3 Unit 2 Reactor Building Mezzanine Level;
- Fire Zone 1.1.2.4 Unit 2 Reactor Building Third Floor;
- Fire Zone 9.1 Unit 1 Diesel Generator; and
- Fire Zone 9.2 Unit 2 Diesel Generator.

During the walkdowns the inspectors verified that transient combustibles were controlled in accordance with the licensee's procedures. The inspectors observed the physical condition of fire suppression devices and passive fire protection equipment such as fire doors, barriers, and penetration seals. The inspectors observed the condition and location of fire extinguishers, hoses, and telephones against the Pre-Fire Plan zone maps. The physical condition of passive fire protection features such as fire doors, fire dampers, fire barriers, fire zone penetration seals, and fire retardant structural steel coatings were also inspected to verify proper installation and physical condition.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On August 26 the inspectors observed Crew C participate in simulator training as part of the Licensed Operator Requalification Training Program. The inspectors monitored the operations crew response to a standby liquid control squib valve circuit failure, a condensate pump trip, the loss of 4160 V Bus 14, the failure of an emergency diesel generator to start, station blackout conditions, a loss of coolant accident, and the need to cool the reactor vessel by implementing steam cooling. The inspectors verified that Crew C correctly implemented the emergency plan and that the actions taken were in accordance with procedures. The inspectors also attended a subsequent critique to ensure that training deficiencies noted by the inspectors were also identified by the licensee's evaluators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors interviewed licensee personnel and reviewed condition reports, preventive maintenance procedures and results, NRC Information Notices, and failure analysis information to determine if weaknesses in maintenance practices contributed to a failure of the 1A core spray room cooler fan inboard motor bearing on July 28, 2002.

b. Findings

The inspectors identified one Green finding involving a Non-Cited Violation due to inadequate bearing installation work instructions and motor lubrication procedures which resulted in the bearing failure.

On July 28, 2002, control room personnel received panel 901-3, alarm 3C, "Core Spray Pump Area Cooler Fan Trip." A non-licensed operator dispatched to the scene determined that the fan breaker had tripped. Attempts to reset the fan breaker were unsuccessful. The unit supervisor declared the room cooler and the 1A core spray system inoperable. The Unit 1 reactor core isolation cooling system was also declared inoperable due to being located in the 1A core spray pump room. Mechanical maintenance personnel determined that the motor breaker tripped due to contact between the rotor and the stator. Later the same day maintenance personnel replaced the motor which allowed the impacted plant equipment to be returned to service.

Four days after the failure, the licensee inspected the failed motor and discovered a large amount of grease. Exelon Power Labs personnel performed a bearing failure analysis and determined that poor bearing fit-up during installation also contributed to the bearing failure. The inspectors discussed this information with engineering and maintenance personnel and learned that the 1A core spray room cooler fan motor bearings were last replaced in 1991. At that time the Quad Cities Station did not have procedures or work instructions in place that required measuring fit-up bearing tolerances. Due to the improper fit-up the motor shaft and bearing bore experienced excessive wear between 1991 and 2002. The fit-up error also caused the fan inboard motor bearing to operate at a temperature between 284^0 F and 425^0 F. The increase in bearing temperature further expanded the bearing clearances and accelerated the bearing and motor shaft wear. The inspectors noted that a 1994 change in maintenance work instructions required that fit-up bearing tolerances be measured during subsequent bearing replacements.

The inspectors also determined that the licensee had not adequately incorporated information provided in previous NRC information notices into their preventive maintenance programs and procedures. On April 12, 1988, the NRC issued Information Notice 88-12, "Overgreasing of Electric Motor Bearings." This information notice described two basic mechanisms which resulted in motor bearing failure due to overgreasing. Mechanism Number 2 provided specific information on bearing overgreasing which resulted in high bearing temperatures, expansion and slippage of the bearing's inner race, and contact between the stator and rotor.

In July 1994 the NRC issued Information Notice 94-51, “Inappropriate Greasing of Double Shielded Motor Bearings,” to alert licensees of safety-related equipment failures due to unneeded lubrication. The licensee’s initial review of the information notice determined that no inappropriate motor lubrication issues existed. As part of the apparent cause review for the 1A core spray room cooler motor bearing failure, the licensee reviewed their response to Information Notice 94-51 and found that the motors listed in QCEMS 0250-06, “Exhaust Fan and Room Cooler Motor Environmental Qualification Surveillance,” were not included as part of the original information notice review. Procedure QCEMS 0250-06 stated that bearings on the core spray, reactor core isolation cooling, and residual heat removal room cooler motors, as well as the standby gas treatment system motors, should be lubricated every 3 years. However, further review of maintenance information showed that each of these components contained motors with double shielded bearings which did not require lubrication. As a result, the licensee’s incorrect procedure had led to the inappropriate greasing of these motor bearings every 3 years since at least 1991.

The inspectors determined that the failure to have adequate work instructions and procedures to ensure that 1A core spray room cooler fan motor bearing tolerances were appropriate, and to prevent the lubrication of the motor’s shielded bearings, was more than minor. This determination was made based on the fact the lack of instructions effected the procedure quality and equipment performance attributes of the mitigating systems cornerstone and impacted the availability, reliability, and capability of equipment used to respond to initiating events in order to prevent undesirable consequences. The inspectors also determined that this issue was able to be evaluated using the Significance Determination Process because the issue was associated with the operability, availability, reliability, or function of a system or train in a mitigating system.

The inspectors performed a Phase 1 Significance Determination Process screening and determined that the failure of the 1A core spray room cooler was of very low risk significance (Green) because the failure of the room cooler, a support system, was not caused by a design or qualification deficiency, did not result in actual loss of safety function for the core spray or reactor core isolation cooling systems, and did not screen as potentially risk significant due to a seismic, fire, flooding, or severe weather initiating event.

Technical Specification 5.4.1 requires that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix B, February 1978. Section 9 of Regulatory Guide 1.33, Revision 2, Appendix B, February 1978, requires that maintenance affecting the performance of safety-related equipment be performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstance. The failure to have documented instructions for bearing tolerance measurements between 1991 and 1994, and the failure to have written procedures appropriate to the circumstance for the greasing of multiple safety-related motors since 1991, was considered a Non-Cited Violation of Technical Specification 5.4.1 **(NCV 50-254/02-07-01)** in accordance with Section VI.A.1 of the NRC’s Enforcement Policy. This issue was entered into the licensee’s corrective action program as Condition Report 117266.

1R13 Maintenance Risk and Emergent Work (71111.13)

a. Inspection Scope

The inspectors reviewed the documents listed in the "List of Documents Reviewed" section of this report to determine if the risk associated with the activities listed below agreed with the results provided by the licensee's risk assessment tool. In each case, the inspectors conducted detailed walkdowns to ensure that redundant mitigating systems and/or barrier integrity equipment credited by the licensee's risk assessment remained available. When compensatory actions were required, the inspectors conducted plant inspections to validate that the compensatory actions were appropriately implemented. The inspectors also discussed emergent work activities with the shift manager and work week manager to ensure that these additional activities did not change the risk assessment results.

Maintenance Activity Assessed	**Week Inspected**
Unit 1 Emergency Diesel Generator Planned Maintenance	July 1, 2002
Lifting and Removal of the Unit 2 Reactor Vessel Head	July 15, 2002
Unit ½ Emergency Diesel Generator Planned Maintenance	July 20, 2002
Unit 1 High Pressure Coolant Injection System Isolated due to Steam Leak	July 29, 2002
Unit 1 Residual Heat Removal, Residual Heat Removal Service Water, and Reactor Water Cleanup Planned Maintenance	August 19, 2002
Risk Associated with Raising Unit 2 Reactor Power to 930 MWe	August 28, 2002
Unit 1 Station Blackout Diesel Generator Planned Maintenance	September 9, 2002

b. Findings

No findings of significance were identified.

1R14 Nonroutine Plant Evolutions (71111.14)

a. Inspection Scope

The inspectors observed control room activities associated with the shut down of Unit 1 on August 2 due to a packing leak on the high pressure coolant injection inlet steam admission valve and an increase in Unit 2 reactor power from 912 MWe to 930 MWe. The inspectors determined by direct observation and a review of procedural requirements that reactivity manipulations were verified by a second licensed operator, that operations

personnel were complying with procedures and Technical Specifications, and that plant parameters were as expected for each operating condition.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 2A Residual Heat Removal Room Cooler Normal/Alternate Switch Fails to Operate

a. Inspection Scope

On September 13, 2002, the inspectors reviewed the operability evaluation for the 2A residual heat removal room cooler normal/alternate switch to ensure that the operability evaluation information did not conflict with Updated Final Safety Analysis Report, Technical Specifications, and Appendix R Fire Protection information. The inspectors also reviewed the work history for the normal/alternate switch to determine if the current failure was similar to two previous failures.

b. Findings

The inspectors identified one Green finding and associated Non-Cited Violation due to the failure to take adequate corrective actions to address a long-standing material condition issue associated with the normal/alternate switch.

On August 18, 2002, operations personnel discovered that the 2A residual heat removal room cooler failed to start automatically or manually. Initial troubleshooting efforts determined that the contactor for the normal power supply was sluggish and needed an additional 15 to 20 seconds to operate and transfer to the alternate power supply. Personnel performed several additional switch manipulations and were unable to duplicate the sluggish operation.

Engineering completed Operability Evaluation 119871 and determined that the ability to supply power to the 2A residual heat removal room cooler using the normal power supply remained operable since the normal/alternate switch was not required to operate during a loss of coolant accident. Under certain fire scenarios, operations personnel manipulated the normal/alternate switch to control the source of power to the 2A residual heat removal room cooler. Operability of the room cooler during certain fire scenarios was assured through the implementation of a compensatory action. Specific issues related to the implementation of the compensatory action are discussed in Section 4OA3.2 of this inspection report. No issues were identified concerning the technical information provided in the operability determination.

The inspectors reviewed the 2A residual heat removal room cooler normal/alternate switch work history and determined that the August 2002 failure was similar to two previous failures. In June 1999 a self-revealing failure led to discovering that the normal feed contactor would not drop out when the normal/alternate switch was taken from the normal position to the alternate position. Corrective actions consisted of burnishing the

contacts and returning the switch to service. While performing QCOS 1000-14, "RHR Room Cooler Fan Alternate Power Feed Test for Appendix R" in October 2001, the licensee discovered the normal contactor was stuck and the B phase contacts were tacked together. Initial corrective actions for this failure consisted of unsticking and burnishing the contacts. The licensee also conducted an additional review of possible failure mechanisms that could be contributing to the failures.

The inspectors reviewed the licensee's report on possible failure mechanisms to determine the failure mechanisms considered and to understand why certain mechanisms were eliminated from consideration. The inspectors determined that the licensee believed the switch failures were caused by randomly distributed impurities in the B phase contacts. Although engineering personnel initially eliminated mechanical binding of the contactor as a potential failure mechanism due to the contactor operating freely during troubleshooting, they recommended that the contactor mechanism be replaced. This recommendation was later revised to replace the contacts only due to the licensee's belief that the switch failures were caused by contact impurities and parts availability issues.

The licensee's investigation of the August 2002 failure determined that the previous failures of the normal/alternate switch were likely caused by mechanical binding of the contactor mechanism. As a result, the licensee's corrective actions for the 1999 and 2001 switch failures were not effective in correcting the previous equipment deficiency. The licensee implemented a modification to remove the contactor mechanism from the room cooler circuitry.

The inspectors determined that the failure to correct the multiple normal/alternate switch failures was more than minor because the switch failures impacted the availability, reliability, and capability of equipment used to respond to initiating events and prevent undesirable consequences from external factors such as fire. The inspectors also determined that this finding was able to be assessed using the Significance Determination Process because the finding was associated with the operability, availability, reliability, or function of a system or train in a mitigating system. The inspectors conducted a Phase 1 Significance Determination Process screening and determined that the failure to adequately address the cause of multiple failures of the 2A residual heat removal normal/alternate switch was of very low risk significance (Green) because this finding did not result in a design or qualification deficiency, did not represent an actual loss of safety function of any type, and did not screen as potentially risk significant due to a fire using the criteria specified on page 3 of the Phase 1 Significance Determination Process screening worksheet. Specifically, the site specific safe shutdown analysis required that operations personnel manipulate the normal/alternate switch within 52 hours of a plant fire to provide equipment protection. If the normal/alternate switch failed to operate, the licensee demonstrated the ability to take additional manual actions to operate the switch within the 52 hour time frame specified.

Criterion XVI of 10 CFR Part 50, Appendix B states that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. The inspectors determined that the licensee's failure to adequately correct multiple failures of the 2A residual heat removal room cooler

normal/alternate switch between June 1999 and August 2002 was a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI in accordance with Section VI.A.1 of the NRC's Enforcement Policy **(NCV 50-265/02-07-02)**. This issue was entered into the licensee's corrective action program as Condition Report 119871.

.2 Review of Other Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability evaluations listed below during this inspection period:

Operability Evaluation Title	**Date Reviewed**
2A Station Blackout Diesel DC Lube Oil Pump Did Not Start	July 2, 2002
Increased Temperature Reading for the 3C Electromatic Relief Valve or Associated Thermocouple	August 8, 2002
1A Residual Heat Removal Service Water Crosstie Valve Leaking By	August 20, 2002

During each review the inspectors compared the technical justification provided in the operability evaluation to information contained in the Technical Specifications, the Updated Final Safety Analysis Report, and other design basis documents to ensure that the structure, system, or component remained able to perform its safety function. When applicable, the inspectors verified that compensatory actions did not impact the ability of other structures, systems, or components to perform their functions and that appropriate compensatory actions were in place when needed, would work as intended, and were properly controlled.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors assessed the following operator workarounds:

Operator Work Around Title	Date Reviewed
Operator Challenge 01-019OC; Power Changes Experienced on Each Unit Due to Operations of "B" Control Room HVAC Causing 1B and 2A Recirculation Pump Speed Changes	September 11, 2002
Operator Workaround 99-015OWA; Operator Actions Required to Start Control Room Ventilation in Pressurized Mode	September 11, 2002
Operator Workaround 02-009OWA; U1 Reactor High Pressure Scram Setpoint of 1024 psig is Lower than the Reactor High Pressure Alarm Setpoint of 1040 psig	September 25 - 27, 2002

The inspectors reviewed the operator workarounds to assess any potential effect on the functionality of mitigating systems. The inspectors reviewed the technical adequacy of the licensee's work around documentation against the Updated Final Safety Analysis Report and other design information to assess whether the work around conflicted with any design basis information. Lastly, the inspectors compared the information in abnormal or emergency operating procedures to the work around information to ensure that the operators maintained the ability to implement important procedures.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed and/or reviewed the following post maintenance testing activities during this inspection period:

Post Maintenance Activity	Date Inspected
Testing Following Valve 1-2301-4 Packing Replacement	August 5, 2002
Testing Following Valve 1-1001-7B Stem and Stem Nut Replacement	August 16-23, 2002
Calibration of 3 Standby Gas Treatment System Instruments and Adjustment of Time Delay Relay	September 11-13, 2002

Rebuild of the 1/2B Diesel Fire Pump	September 12, 2002
Testing Following the Preventive Maintenance Overhaul of the Unit 1 Station Blackout Diesel Generator	September 10-14, 2002
Testing Following Maintenance on the 1B Reactor Feed Pump	September 21, 2002

For each post maintenance testing activity selected, the inspectors reviewed the Technical Specifications and Updated Final Safety Analysis Report against the maintenance work package to determine the safety function(s) that may have been affected by the maintenance. Following this review, the inspectors verified that the licensee's post maintenance test procedure adequately tested the safety function(s) affected by the maintenance, that the procedure's acceptance criteria were consistent with licensing and design basis information, and that the procedure was properly reviewed and approved. When possible, the inspectors observed the post maintenance testing activity and verified that the structure, system, or component operated as expected; test equipment, when used, was adequately calibrated and within its current calibration cycle; test equipment used was within its required range and accuracy; jumpers and lifted leads were appropriately controlled; test results were accurate, complete, and valid; test equipment was removed after testing; and any problems identified during testing were appropriately documented.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage (71111.20)

a. Inspection Scope

The inspectors monitored activities associated with the failure of the Unit 2 steam dryer and subsequent Unit 2 shutdown. The inspectors observed multiple discussions between the licensee and General Electric personnel, reviewed the documents listed in the "List of Documents Reviewed" section of this report, watched videotaped inspections of the steam dryer, separator, and main steam lines, observed steam dryer repair activities, and participated in conference calls between the NRC, the licensee, and General Electric to monitor the licensee's root cause investigation and associated corrective actions. The results of the inspectors' review were discussed with technical experts within the NRC and compared with information provided in the Updated Final Safety Analysis Report and the Extended Power Uprate submittal.

The inspectors also attended daily outage meetings, reviewed control room operator logs, and conducted daily control room tours to ensure that shutdown safety was maintained throughout the outage, reactor coolant system instrumentation provided accurate information, the decay heat removal systems were functioning properly, and inventory and reactivity controls were maintained.

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 surveillance test packages for the equipment listed below:

- QCOS 1400-01, “Quarterly Core Spray System Flow Rate Test,” Revision 21, on July 24; and
- QCOS 0300-17, “One-Rod-Out Interlock Surveillance,” Revision 7, on July 19 and August 2.

The inspectors verified that the structures, systems, and components tested were capable of performing their intended safety function by comparing the surveillance procedure and results to design basis information contained in Technical Specifications, the Updated Final Safety Analysis Report, and licensee procedures. The inspectors verified that the test was performed as written, the test data was complete and met the requirements of the procedure, and the test equipment range and accuracy were consistent with the application by observing the performance of the surveillance test. Following test completion, the inspectors conducted a walkdown of the test area to verify that the test equipment had been removed and that the system was returned to its normal standby configuration.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

On July 15 the inspectors reviewed the acceptability of modifications to the Unit 2 reactor vessel level 3 trip setpoint and the anticipated transient without scram recirculation pump trip setpoint by comparing the 10 CFR 50.59 screening and evaluation information against the Updated Final Safety Analysis Report, Technical Specifications, and engineering calculations. The comparison was performed to ensure that the revised setpoints remained consistent with design basis information. The inspectors observed installation and testing of the temporary modifications when possible and verified that the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability, and that operation of the modifications did not impact the operability of any interfacing systems. The inspectors also reviewed condition reports initiated during or following temporary modification installation to ensure that problems encountered during installation were appropriately resolved.

b. Findings

No findings of significance were identified.

Emergency Preparedness (EP)

1EP6 Emergency Preparedness Drill Evaluation (71114.06)

a. Inspection Scope

On August 28 the inspectors observed an operations crew participate in an emergency preparedness simulator drill. The inspectors monitored the operations crew respond to a feedwater flow transmitter failure, the loss of 4160 Volt Bus 11, loss of coolant accident, and an anticipated transient without a scram. The inspectors verified that appropriate actions were taken by the operators, the proper emergency procedures were implemented, and that the crew made the proper emergency classifications in a timely manner. The inspectors also attended the licensee's critique to verify that training personnel adequately evaluated the crew's emergency plan implementation.

b. Findings

No findings of significance were identified.

3. SAFEGUARDS

Physical Protection (PP)

3PP3 Response to Contingency Events (71130.03)

.1 Routine Inspection Conducted by Division of Reactor Safety Personnel

a. Inspection Scope

The inspectors reviewed the licensee's current protective strategy which included designated targets and target sets, their associated analysis, and security and operation response procedures. The inspectors also reviewed security event reports, and portions of the licensee's problem identification and resolution program to determine that issues related to the licensee's contingent event program were identified at the appropriate threshold and were entered into the licensee's corrective action program. Items reviewed included self-assessments, audits, and a sample of training records, force on force drill evaluations, and the licensee's procedure for their corrective action process. In addition, the inspectors conducted interviews with security officers and security management to evaluate their knowledge and use of the licensee's corrective action system.

The inspectors reviewed appropriate security records and procedures that were related to security drills, drill demonstrations, and drill critiques to verify the licensee's continuing capabilities to identify issues that represented uncorrected performance weaknesses or program vulnerabilities.

The inspectors reviewed records and interviewed three selected members of the uniformed contract security force to evaluate and verify security training that related to alarm station operations, tactical "force-on-force" training, and weapon proficiency training.

The inspectors also reviewed performance indicator information related to alarm equipment performance to determine if isolated or system problems with the protected area intrusion alarm system and/or assessment system had become predictable and potentially exploitable by an adversary.

b. Findings

No findings of significance were identified.

.2 Verification of Licensee's Threat Level IV Actions

The Office of Homeland Security (OHS) developed a Homeland Security Advisory System (HSAS) to disseminate information regarding the risk of terrorist attacks. The HSAS implements five color-coded threat conditions with a description of corresponding actions at each level. NRC Regulatory Information Summary (RIS) 2002-12a, dated August 19, 2002, "NRC Threat Advisory and Protective Measures System," discusses the HSAS and provides additional information on protective measures to licensees.

a. Inspection Scope

On September 10, 2002, the NRC issued a Safeguards Advisory to reactor licensees to implement the protective measures described in RIS 2002-12a in response to the Federal government declaration of threat level "Orange."

The inspectors interviewed licensee personnel and security staff, observed the conduct of security operations, and assessed licensee implementation of the protective measures. Inspection results were communicated to the region and headquarters security staff for further evaluation.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors reviewed NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73," previously submitted licensee event reports, condition reports, NRC inspection reports and the licensee's performance indicator data sheets to verify the accuracy of the following performance indicators for both units:

Performance Indicator	Time Period Reviewed
Emergency A/C Power Unavailability	June 2001 - June 2002
Reactor Core Isolation Cooling System	June 2001 - June 2002
Safety System Functional Failures	May 2001 - May 2002

The inspectors also discussed the contents of the licensee's performance indicator data sheets with responsible personnel.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Untimely Identification and Documentation of Motor Overgreasing Issue Results in Delay in Evaluating Operability

a. Inspection Scope

The inspectors interviewed engineering and maintenance personnel to determine the adequacy of actions associated with determining and documenting the cause of the 1A core spray room cooler failure, the performance of an extent of condition review, and completion of an operability determination for other plant motors that may have been impacted by overgreasing inadequacies.

b. Findings

The inspectors identified one Green finding and an associated Non-Cited Violation due to the failure to identify and evaluate a potential overgreasing condition on risk significant plant motors in a timely manner. This failure to act resulted in the licensee operating multiple potentially degraded plant motors for more than 40 days without a basis for continued operability.

As stated in Section 1R12 of this inspection report, the licensee experienced an unexpected failure of the 1A core spray room cooler fan motor inboard bearing on July 28, 2002. Operations personnel wrote Condition Report 117266 to document the failure. On July 30 the inspectors reviewed Condition Report 117266 and the associated corrective actions. The corrective actions included sending the failed bearing to an independent laboratory for analysis by August 9, determining the extent of condition, and developing an apparent cause with associated corrective actions by September 16, 2002.

Approximately 4 days after the failure, the licensee conducted a motor inspection and determined that a large amount of grease was present. On August 2 engineering personnel informed the inspectors of the motor inspection results. The inspectors were concerned that the large amount of grease in the motor could be indicative of a wide spread plant lubrication issue and make the plant susceptible to a common mode failure

of risk-significant equipment. The inspectors questioned engineering and maintenance personnel to determine the following:

- whether a condition report had been written to document the large amount of grease;
- what actions had been taken to address the operability of other motors that may have been overgreased; and
- whether actions needed to be developed and taken prior to September 16 to address operability and common mode failure concerns.

The inspectors were informed that a condition report had not been written. Instead, the licensee planned to wait and initiate a condition report after an independent laboratory had confirmed the reason for the motor failure. In the interim, the licensee planned to conduct vibration monitoring on all other emergency core cooling system room cooler motors by August 7.

Prior to August 7 the licensee informed the inspectors that the use of vibration monitoring as a predictive maintenance tool for the emergency core cooling system room cooler motors may not be adequate due to the motors being belt-driven. Since increased bearing temperature was an indication of possible motor overgreasing, the inspectors questioned maintenance personnel and determined that thermography was not currently part of the predictive maintenance program for belt-driven motors. Following these discussions, the licensee stated that thermography would also be conducted on the emergency core cooling system room cooler motors.

On August 8 maintenance personnel contacted the inspectors and informed them that vibration and thermography readings on all of the emergency core cooling system room cooler motors were satisfactory. The inspectors questioned whether predictive maintenance techniques had been performed on any other plant motors. No action had been taken. As a result, the licensee still had not provided justification to explain why the overgreasing issue was limited to the emergency core cooling system room cooler motors or document the basis for continued operability of all remaining plant motors.

Between August 8 and 15, the inspectors held multiple discussions with engineering and operations personnel to determine what actions would be taken to address the operability of all remaining plant motors. Again, the inspectors were informed that a condition report documenting the extent of condition and potential for common mode failure would not be generated until the licensee received confirmation of the failure mechanism from the independent laboratory.

The inspectors reviewed procedures governing the corrective action and operability determination programs to determine whether the licensee's actions were in accordance with each procedure. Procedure LS-AA-125, "Corrective Action Program," states that all station personnel were responsible for:

- identifying conditions that have, or could have, an undesirable effect on performance of equipment;
- ensuring necessary immediate actions were in place;

- reporting the condition to a supervisor or the control room; and
- originating a condition report.

In addition to the requirements of LS-AA-125, Procedure LS-AA-105, "Operability Determinations," stated that if a supervisory review identified a potential operability issue, operations management shall be contacted to determine and document the operability status of the affected structures, systems, or components in accordance with the corrective action program. The inspectors discussed the procedural requirements, the failure to initiate a condition report once the large amount of grease was discovered, and the lack of justification for continued operability of remaining plant motors with engineering management. Engineering management agreed to initiate Condition Report 119601 to document the failure to write a condition report once the large amount of grease was discovered, the lack of action regarding the operability of remaining plant motors, and the operability of all remaining plant motors.

On August 16 the inspectors reviewed Condition Report 119601 to ensure that it appropriately described the concerns listed above. The inspectors determined that Condition Report 119601 documented the presence of a large amount of grease in the 1A core spray room cooler motor and provided justification for continued operation of the remaining emergency core cooling system room cooler motors. The condition report was silent regarding the failure to initiate a condition report on August 1. In addition, Condition Report 119601 failed to provide a justification for continued operation of motors other than the emergency core cooling system room cooler motors. Engineering management subsequently initiated Condition Report 120019 to document the failure to initiate a condition report on August 1. By September 9 the licensee had conducted additional reviews which limited the potential motor overgreasing issue to the emergency core cooling system room coolers. Justification for continued operability of all remaining risk significant plant motors was also addressed.

The inspectors determined that the failure to follow procedures to identify conditions that may have an undesirable effect on equipment performance and document the basis continued operability of impacted plant equipment was more than minor because the continued availability and reliability of mitigating systems equipment used to respond to initiating events and prevent undesirable consequences could not be assured. The inspectors also determined that this issue could be assessed using the Significance Determination Process because the finding was associated with the operability, availability, reliability, or function of a system or train in a mitigating system.

The inspectors conducted a Phase 1 Significance Determination Process screening and determined that this finding was of very low risk significance (Green) because the finding was not a design or qualification deficiency confirmed not to result in a loss of function per Generic Letter 91-18. In addition, the licensee did not take credit for post accident operation of the emergency core cooling system room coolers as part of their probabilistic risk assessment.

Criterion XVI of 10 CFR Part 50, Appendix B states that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. The inspectors determined that the licensee's failure to take

action to promptly identify a large amount of grease was present in the 1A core spray room cooler motor by documenting this issue in their corrective action program and take required actions between July 28 and September 9 was a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI in accordance with Section VI.A.1 of the NRC's Enforcement Policy **(NCV 50-254/02-07-03)**. This issue was entered into the licensee's corrective action program as Condition Report 120019.

.2 Review of Compensatory Action for Residual Heat Removal Normal/Alternate Switch

a. Inspection Scope

The inspectors discussed the implementation of compensatory action Number 1 for Operability Determination 119871 (discussed in Section 1R15.1) with engineering and operations personnel. The inspectors verified that the compensatory action could be completed when needed, compensatory action information had been properly incorporated into plant documents, and that the impact of the compensatory action on remaining plant equipment was adequately evaluated.

b. Findings

The inspectors determined that operations personnel had not used the appropriate mechanism for implementing the compensatory action. In addition, the inspectors determined that the licensee had misapplied guidance regarding 10 CFR 50.59 reviews which resulted in the reviews not being performed.

To maintain the 10 CFR 50, Appendix R function of the 2A residual heat removal room cooler normal/alternate switch, Operability Determination 119871 required that operations management provide directions on the operation of the normal/alternate switch following a switch failure. Operations personnel chose to communicate this information by implementing Operations Standing Order 02-006, "Compensatory Measures for 2A Residual Heat Removal Room Cooler Alternate Power Supply." The inspectors reviewed the standing order and determined that the information in the standing order was similar to a procedure. For example, the standing order directed the operation of specific breakers and disconnect switches. The inspectors were also concerned that the licensee's use of a standing order rather than a procedure resulted in bypassing the 10 CFR 50.59 process used to assess the impact of the compensatory action on other plant equipment as described in NRC Generic Letter 91-18.

Following a review of Procedure OP-AA-102-104, "Pertinent Information Program," the inspectors determined that standing orders were not to be used as a substitute for procedures. The inspectors discussed the use of the standing order with operations management and were informed that the standing order was used to ensure that an operator workaround was not proceduralized. After further review of the standing order by licensee management, the licensee agreed that the use of a standing order to implement the compensatory action was not appropriate. Operations personnel initiated Condition Report 123180 to document this issue and implemented the appropriate procedure change.

The following day the inspectors requested copies of the 10 CFR 50.59 screening forms to determine if the licensee had adequately addressed issues associated with the procedure change and the potential impact of the compensatory action on remaining plant equipment. The inspectors were initially informed that a 10 CFR 50.59 screening was not required since the procedure change implemented a maintenance work activity. The inspectors reviewed Procedure LS-AA-104-1000, "Exelon 50.59 Resource Manual," and determined that a 10 CFR 50.59 screening was not required for maintenance activities controlled under the requirements of the maintenance rule. However, the 2A residual heat removal normal/alternate switch was considered 10 CFR 50, Appendix R equipment which was not controlled as part of the maintenance rule. The inspectors discussed this information with operations and regulatory assurance personnel. Condition Report 123870 was written to document this issue. Corrective actions included completing the 10 CFR 50.59 screenings as appropriate.

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 cause and corrective actions for the licensee event reports discussed in the "Findings" section below. The inspectors evaluated the timeliness, completeness, and adequacy of the root cause and corrective actions in accordance with the requirements of 10 CFR Part 50, Appendix B, as appropriate.

b. Findings

(Closed) Licensee Event Report 50-265/02-002-00: Manual Scram due to Reactor Level Transient as a Result of a Digital Feedwater Level Control System Design Error. The inspectors documented one Green finding during a review of the initial event (see Inspection Report 50-254/02-05; 50-265/02-05). On June 3, 2002, the licensee submitted the event report which documented root cause and corrective action information. The inspectors reviewed the event report and determined that the documented information did not change the inspectors' initial assessment of the event.

(Closed) Licensee Event Report 50-265/02-003-00: Reactor Shutdown due to Failure of Reactor Steam Dryer from Flow-Induced Vibrations as a Result of Extended Power Uprate. On June 7, 2002, Quad Cities Unit 2 began experiencing unexpected changes in reactor power, reactor pressure, reactor level, main steam line flow, and moisture carryover. The licensee evaluated the changes in plant parameters and determined the most likely cause to be a degraded steam dryer. The licensee conducted an operability evaluation which supported continued operation of the unit based upon reasonable assurance that if any loose parts occurred, the parts could not migrate such that they would affect safety-related equipment.

Over the next 30 days, Unit 2 continued to experience low level plant transients which resulted in changes to reactor power, reactor pressure, reactor level, and steam flow. In early July, Unit 2 experienced a transient which indicated that pieces of the steam dryer

were migrating from the reactor vessel and entering the main steam line(s). Since the pieces could potentially impact the operability of multiple safety systems, the licensee entered Technical Specification 3.0.3 and shut down Unit 2.

On July 13 the licensee inspected the Unit 2 reactor vessel internals and determined that a steam dryer cover plate had failed. Pieces of the steam dryer were found in the A main steam line, the A main steam line flow venturi, and in a main turbine stop valve inlet strainer. Based upon the actual steam dryer failure and the migration of the dryer pieces, the licensee determined that all of the Unit 2 systems would have operated as designed.

The inspectors determined that the unexpected changes in plant parameters and the failure of the Unit 2 steam dryer was more than minor since the reliability of the steam dryer was challenged and the unexpected changes in plant parameters created a condition which increased the likelihood of a plant transient. The inspectors performed a Significance Determination Process Phase 1 screening and determined that the unexpected changes in plant parameters and the failure of the Unit 2 steam dryer was of very low risk significance (Green) since neither condition contributed to the likelihood of a primary or secondary loss of coolant accident initiator, contributed to the likelihood of a reactor trip and that mitigating equipment or functions would not be available, or increased the likelihood of a fire or an internal or external flood **(FIN 50-265/02-07-04)**. This issue was not subject to NRC enforcement since the steam dryer is a non-safety-related component and the steam dryer pieces did not impact the operation of safety-related equipment.

4OA6 Meetings

.1 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 1, 2002. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meeting

Interim exits were conducted for:

- Physical Security inspection with Mr. T. Tulon on August 2, 2002.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

Title 10 CFR 73.21(d)(2) states in part, “While unattended, safeguards information shall be stored in a locked security storage container.” Contrary to this requirement, safeguards information (safeguards container combination) found in a central files office,

located within the protected area, was not stored in a locked security storage container. While the exact duration of this issue is not known, it existed for at least 2 months. The licensee entered the issue into both their corrective action program (Condition Report 93635) and safeguards event log. The inspectors determined the safety significance of this issue to be of very low significance (Green) because there was no evidence that safeguards information located in the containers was compromised.

KEY POINTS OF CONTACT

Licensee
T. Tulon, Site Vice President
B. Swenson, Plant Manager
D. Barker, Radiation Protection Manager
W. Beck, Regulatory Assurance Manager
G. Boerschig, Work Control Manager
R. Gideon, Engineering Manager
K. Hungerford, Wackenhut Project Manager
A. Javorik, Maintenance Manager
M. Karney, Midwest ROG Security Manager
K. Leech, Security Manager
K. Moser, Chemistry/Environ/Radwaste Manager
M. Perito, Operations Manager
M. Snow, Nuclear Oversight Manager

U.S. Nuclear Regulatory Commission
M. Ring, Chief, Reactor Projects Branch 1
C. Lyon, Project Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-254/02-07-01	NCV	Failure to Have Appropriate Bearing Fit-up and Motor Lubrication Instructions
50-265/02-07-02	NCV	Failure to Adequately Correct Multiple Failures of the 2A RHR Normal/alternate Switch
50-254/02-07-03	NCV	Failure to Document an Overgreasing Issue in the Corrective Action Program and Take Action to Address the Extent of Condition
50-265/02-07-04	FIN	Unexpected Changes in Unit 2 Operating Parameters and Dryer Failure Due to Flow Induced Vibration

Closed

50-265/02-002-00	LER	Manual Scram Due to Reactor Level Transient as a Result of a Digital Feedwater Level Control System Design Error
50-265/02-003-00	LER	Reactor Shutdown Due to Failure of Reactor Steam Dryer from Flow Induced Vibrations as a Result of Extended Power Uprate

50-254/02-07-01	NCV	Failure to Have Appropriate Bearing Fit-up and Motor Lubrication Instructions
50-265/02-07-02	NCV	Failure to Adequately Correct Multiple Failures of the 2A RHR Normal/alternate Switch
50-254/02-07-03	NCV	Failure to Document an Overgreasing Issue in the Corrective Action Program and Take Action to Address the Extent of Condition
50-265/02-07-04	FIN	Unexpected Changes in Unit 2 Operating Parameters and Dryer Failure Due to Flow Induced Vibration

LIST OF ACRONYMS AND INITIALISMS USED

HSAS	Homeland Security Advisory System
LP	Lesson Plan
MWe	Megawatts Electric
NO	Nuclear Oversight
OHS	Office of Homeland Security
RIS	Regulatory Information Summary

LIST OF DOCUMENTS REVIEWED

1R04 Equipment Alignment

Number	Subject/Title	Date/Revision
QCOP 6600-01	Diesel Generator 1 Preparation for Standby Operation	Revision 27
QCOP 6600-01	Diesel Generator 2 Preparation for Standby Operation	Revision 27
QCOP 1300-01	Reactor Core Isolation Cooling System Preparation for Standby Operation	Revision 21
TCCP 337231	Install Supplemental Cooling Equipment for Quad Unit 2 Iso Phase Bus Duct Cooling	Revision 3
	List of Engineering Changes for the Turbine Building Closed Cooling Water System	August 5, 2002
	List of Engineering Change Requests for the Turbine Building Closed Cooling Water System	August 5, 2002
	List of Recently Initiated Condition Reports for the Turbine Building Closed Cooling Water System	August 2, 2002
	List of Open Work Orders for the Turbine Building Closed Cooling Water System	August 2, 2002
	TBCCW System Walkdown Checklist	Revision 4
	Turbine Building Closed Cooling Water System Health Report	

1R05 Fire Protection

Number	Subject/Title	Date/Revision
	Commonwealth Edison Company Quad Cities Nuclear Power Station 1 & 2 Pre-Fire Plans	Revision 20
	Quad Cities Station Units 1 & 2 Fire Hazards Analysis	August 2001

1R11 Licensed Operator Requalification Program

Number	Subject/Title	Date/Revision
Operating Exam 26	SBLC Squib Circuit Failure/Condensate Pump Trip/Loss of Bus 14/Diesel Generator Failure/ Station Blackout/LOCA-Steam Cooling	Revision 11
QGA 100	Reactor Pressure Vessel Control	Revision 7
QGA 200	Primary Containment Control	Revision 8
QGA 500-2	Steam Cooling	Revision 9
QGA 500-4	Reactor Pressure Vessel Flooding	Revision 12

1R12 Maintenance Effectiveness

Number	Subject/Title	Date/Revision
QDC-28987	Failure Analysis of the 1A Core Spray Room Cooler Bearing, Component 1-5748-A, SKF; 6206-2Z/C3HT51, Quad Unit No. 1	August 20, 2002
QCEPM 0400-07	Motor Lubrication	Revision 17
NRC Inspection Manual Part 9900	Operable/Operability Ensuring the Functional Capability of a System or Component	
Condition Report 117266	Breaker for 1A Core Spray Room Cooler Found in a Tripped Condition	July 28, 2002
Condition Report 119601	Preliminary Cause of 1A Core Spray Room Cooler Bearing Failure	August 16, 2002
QCEMS 0250-06	Exhaust Fan and Room Cooler Motor Environmental Qualification Surveillance	Revision 9
NRC Information Notice 88-12	Overgreasing of Electric Motor Bearings	April 12, 1988
NRC Information Notice 94-51	Inappropriate Greasing of Double Shielded Motor Bearings	July 15, 1994
	Vibration Monitoring Results for the 1A Core Spray Room Cooler Motor Bearings	November 1998 - July 2002
Apparent Cause Report for Condition Report 117266	Apparent Cause Evaluation for the Bearing Failure of the 1A Core Spray Room Cooler Motor Bearing	September 9, 2002

1R13 Maintenance Risk Assessment and Emergent Work

Number	Subject/Title	Date/Revision
OU-AA-103	Shutdown Safety Management Program	Revision 1
	Work Week Safety Profile	Week of July 1, 8, 15 and 28, August 12, and September 9, 2002
OU-QC-104, Attachment 1	Daily Risk Factor Chart	Revision 1
OU-QC-104	Shutdown Safety Management Program Quad Cities Annex	Revision 1
WC-AA-101	On-Line Work Control Process	Revision 6
	Unit 1 and 2 ORAM-SENTINEL Input and Results	Weeks of July 1, 8, 15 and 28, August 12, and September 9, 2002
Condition Report 115455	Nuclear Oversight Observed Reactor Pressure Vessel Head Lift Unattended for 5 Minutes	July 15, 2002
NUREG 0612	Control of Heavy Loads at Nuclear Power Plants	July 1980
WC-AA-104	Review and Screening for Production Risk	Revision 4
	Online Work Schedules	Weeks of July 1, 8, 15 and 28, August 12, and September 9, 2002

1R14 Non-Routine Evolutions

Number	Subject/Title	Date/Revision
Exelon Memorandum	Electrical Operating Limits for Dresden Unit 2 and Quad Cities Unit 2 After EPU	June 11, 2002
Exelon Nuclear Letter RS-01-151	Additional Plant Systems Information Supporting the License Amendment Request to Permit Uprated Power Operation	August 7, 2001
GE Report NEDC-32961P	Power Uprate Safety Analysis Report for Quad Cities Nuclear Power Station Units 1 and 2	December 2000

TIC-498	Quad Cities Unit 2 Power Ascension to 930 MWe Test Procedure	Revision 0
Condition Report 112118	Relay Chatter/Issues with Unit 2 at 930 MWe	August 29, 2002

1R15 Operability Evaluations

Number	Subject/Title	Date/Revision
Operability Evaluation for Condition Report 118099	Electromatic Relief Valve 1-0203-3C / Thermocouple TE 1-0261-14C	August 7, 2002
	Technical Specifications	
	Updated Final Safety Analysis Report	
VETI Manual C0022	Electromatic Relief Valves	
Quad Cities System Overview Drawing 0203-01	Safety and Relief Valve Configuration	Revision 0
LIC Initial/Continuing Training Module LIC-0203.doc	Automatic Depressurization System	Revision 9
Condition Report 113022	2A Station Blackout Diesel DC Lube Oil Pump Did Not Start	June 24, 2002
Condition Report 115309	1A Residual Heat Removal Service Water Valve Leaking By	July 11, 2002
Condition Report 119726	2A RHR Room Cooler	August 18, 2002
Prompt Investigation Report for Condition Report 119726	2A RHR Room Cooler Was Inoperable, Power Supply Selector Switch Found Out of Position	August 19, 2002
Apparent Cause Report for Condition Report 86930	2A RHR Room Cooler Normal Power Contactor Found Stuck in June 1999 and October 2001	March 27, 2002
Condition Report 119871	Testing on 2A and 2B RHR Room Cooler Appendix R Transfer Switches	August 19, 2002
Operability Evaluation for Condition Report 119871	2A RHR Room Cooler Fan Motor Failed to Start as Required	August 22, 2002

	Quad Cities Units 1 and 2 Safe Shutdown Report	
QCARP 0030-05	TB-1 Injection with SSMP and Bringing the Unit to Cold Shutdown	Revision 2
QCARP 0040-02	24-1 Injection with SSMP and Bringing the Unit to Cold Shutdown	Revision 3
QCARP 0060-02	CT-2 Injection with SSMP and Bringing the Unit to Cold Shutdown	Revision 3
	Maintenance Rule Database Information for ECCS Room Coolers	
Condition Report Q1999-02022	Failure of 2A RHR Normal/Alternate Normal Contactor to Drop Out	June 14, 1999
Condition Report Q2001-03053	2A RHR Normal/Alternate Switch Fails to Operate	October 2, 2001
Work Order 98038622-03	Normal Feed Contactor Will Not Drop Out	June 15, 1999
Work Order 99103559-04	Troubleshoot Normal Feed Contactor	October 2, 2001
Work Order 384983	Replace Contacts on Normal Feed	December 19, 2001

1R16 Operator Workarounds

Number	Subject/Title	Date/Revision
Operator Challenge 01-019OC	Power Changes Experienced on Each Unit Due to Operation of “B” Control Room HVAC Causing 1B and 2A Recirculation Pump Speed Changes	September 11, 2002
Operator Workaround 99-015OWA	Operator Actions Required to Start CREV in the Pressurized Mode	September 11, 2002
QCOP 0202-03	Reactor Recirculation System Flow Controller Operation	Revision 11
QCOP 5750-09	Control Room Ventilation System	Revision 26
Condition Report 118035	Reactor High Pressure Scram Setpoint of 1024 psig is Lower than the Reactor High Pressure Alarm Setpoint of 1040 psig	August 2, 2002

1R19 Post Maintenance Testing

Number	Subject/Title	Date/Revision
Work Order 99224204	Overhaul of High Pressure Coolant Injection Valve 1-2301-4	August 1, 2002
QCMM 1515-17	Pressure Seal Gate Valve Maintenance	Revision 3
QCTS 0600-11	HPCI Steam Supply Local Leak Rate Test	Revision 8
QCMM 1515-07	General Valve Packing Procedure	Revision 15
ER-MW-301, Attachment 8	Verification of Rising Stem Valve Running Packing Loads Using VOTES Diagnostics	Revision 0
NES-MS-06.4	Generic Letter 89-10 Post Maintenance Verification Recommendations	Revision 0
	Motor Operated Valve Margin Review for Valve 1-2301-4	November 14, 1998
	Motor Operated Valve Margin Review for Valve 1-2301-4	August 8, 2002
Work Order 480673	Replace Relay 3-6102-4 in Bus 61, Cubicle 2 Unit 1 Station Blackout Diesel Generator	September 13-14, 2002
QCOS 6620-01	SBO 1 (2) Quarterly Load Test	Revision 18
QCOS 2300-06	HPCI System Power Operated Valve Test	Revision 22
Work Order 99210378	Stem Nut Wear Excessive. Replace Stem and Nut	August 13, 2002
QCMM 1525-01	Limitorque Type SMB Valve Operator Removal	Revision 4
QCMM 1515-11	Bolted Bonnet, Non-Pressure Seal Ring Gate Valve Maintenance	Revision 1
QCOS 1000-09	RHR Power Operated Valve Test	Revision 15
ER-MW-301-1001, Attachment 2	Post Static Test Analysis for Valve 1-1001-7B	Revision 0
Training Manual	Motorized Actuator Training for NRC Inspectors	
Work Order 00385033	1B Reactor Feedwater Pump Discharge Check Valve	September 28, 2002
Work Order 0033203501	Adjust A SBGT TDR ½-7541-30A to <25 sec.	September 9, 2002

Work Order 9927669801	Perform Calibration of 0-7541-6A	September 9, 2002
Work Order 9927669601	Perform Calibration of 0-7541-13A	September 9, 2002
Work Order 9927669701	Perform Calibration of 0-7541-34A	September 9, 2002
QIP 0100-11	Calibration of Instruments Used by Operations in Performing Their Surveillance Requirements	Revision 17
QCOS 7500-04	Unit 1 Standby Gas Treatment Initiation and Reactor Building Ventilation Isolation Test	Revision 12
QCOS 7500-05	Standby Gas Treatment System Monthly Operability Test	Revision 22
QCOS 7500-06	Standby Gas Treatment System Power Operated Valve Test	Revision 15
QCAP 0230-19	Equipment Operability	Revision 11
Drawing 4E-1764A	Wiring Diagram Panel 901-40	Revision BB
	Updated Final Safety Analysis Report	
	Technical Specifications and Bases	
Inspection Manual Chapter Part 9900	Maintenance - Preconditioning of Structures, Systems, and Components Before Determining Operability	September 28, 1998
Engineering Change Request 66782	Need a Tolerance for Setting Relays for Time Delay Relays 0-7541-30A and 0-7541-30B	March 16, 2001
Problem Identification Form Q1999-02771	1/2A SBGTS Initiation Time in Standby Exceeds 25 Seconds	August 25, 1999
Condition Report Q2001-00828	Procedures Have Different Criteria for Same Equipment	March 16, 2001
Condition Report 122352	Standby Train of Standby Gas Treatment Failed to Start Within Required Time	September 10, 2002
Work Order 389574	Overhaul ½ B Diesel Fire Pump	September 4, 2002
QCMMS 4100-33	½ B-4101 Diesel Driven Fire Pump Annual Capacity Test	Revision 11

1R20 Refueling and Outage

Number	Subject/Title	Date/Revision
Condition Report 114775	Increased Reactor Pressure	July 9, 2002
Condition Report 115502	Foreign Material Identified in the Unit 2 A Main Steam Line	July 13, 2002
Condition Report 115420	Main Steam Drain Line Tie-Back Pipe Support Clamp Bolts Found Loose	July 12, 2002
Condition Report 115510	Steam Dryer Found Damaged During Visual Inspection	July 12, 2002
Condition Report 115651	Foreign Material Found in Unit 2 Reactor Vessel	July 15, 2002
Condition Report 115692	Tie-Back Support #3 6 2-3001D	July 15, 2002
Condition Report 115500	Indications (Gouges) Were Discovered Around the Unit 2 A Main Steam Line Nozzle	July 12, 2002
Exelon Nuclear Letter RS-01-162	Additional Mechanical Information Supporting the License Amendment Request to Permit Uprated Power Operation at Dresden Nuclear Power Station and Quad Cities Nuclear Power Station	August 13, 2001
Mid Day Information	Quad Cities Station Steam Dryer Repair Outage	July 13, 2002
Engineering Change 337928	Evaluate Minimum Wall Thickness for Line 2-3001A-20" Inside Containment Evaluate Venturi Weld due to Impact	July 16, 2002
General Electric Letter DRF T23-00700-17-17-04	Quad Cities Postulated Lost Part in Steam Separator - Final Evaluation	July 15, 2002
Exelon Memorandum NFM-MW:02-0273	Quad Cities Unit 2 Lost Parts Evaluation for Curved Elbow Fitting	July 18, 2002
Exelon Memorandum NFM-MW:02-0268	Quad Cities Unit 2 Lost Parts Evaluation for Non-retrievable Weld Rod	July 17, 2002
Indication Notification Report Q2M20-02-01	“A” Steam Line Nozzle Inner Blend Radius	July 14, 2002

Indication Notification Report Q2M20-02-02	Steam Dryer Outer Bank Hood at 90 Degrees	July 14, 2002
Indication Notification Report Q2M20-02-03	Steam Dryer Bank Vertical Welds	July 14, 2002
Indication Notification Report Q2M20-02-04	Jet Pump Annulus Area Foreign Material	July 16, 2002
General Electric Letter JLM6M-006	Transmittal of Engineering Documents for Quad Cities 2 Dryer Contingency Repairs	July 14, 2002
General Electric Services Information Letter No. 664	BWR/3 Steam Dryer Failure	August 12, 2002

1R22 Surveillance Testing

Number	Subject/Title	Date/Revision
Condition Report 116279	Is the Mode Switch Considered “Locked” When Key Installed?	July 19, 2002
QCOS 0300-17	One Rod Out Interlock Surveillance	Revision 7
	Updated Final Safety Analysis Report	
	Technical Specification and Bases	
	Bases Change for Technical Specification Surveillance Requirement 3.9.2.1	September 12, 2002
QCOS 1400-01	Quarterly Core Spray System Flow Rate Test	Revision 21

1R23 Temporary Modifications

Number	Subject/Title	Date/Revision
GE-NE-T2300700-17-16-02	Lost Parts Analysis For Potential Steam Dryer Lost Parts in Quad Cities Generating Station Unit 2	June 18, 2002
Condition Report 114874	Engineering Change 337588 - Temporary Modification Inaccurate Calibration Information	July 3, 2002
Engineering Change 337588	Setpoint Change for Reactor Water Level Instrumentation	June 21, 2002
50.59 Screening QC-S-2002-0229	Revise Reactor Protection System Low Level Scram Setpoints at the Master Trip Units	June 21, 2002
Calculation NED-I-EIC-0022	Reactor Vessel Low Water Level Scram and Low-Low Level Isolation Setpoint Error Analysis at Normal Operating Conditions	Revision 3

Engineering Change 337688	Setpoint Change for the ATWS Recirculation Pump Trip Instrumentation	June 22, 2002
Condition Report 115079	Incorrect Design Input Data In ATWS Engineering Change 337688	July 8, 2002
DCR 990858 to Calculation NED-I-EIC-0047	ATWS Analog Trip System Setpoint Error Analysis	Revision 2A
Condition Report 112834	Outage Control Center Decision Making Process Not Well Defined	June 21, 2002

1EP6 Emergency Preparedness Drill Evaluation

Number	Subject/Title	Date/Revision
LOCT-1051 EPU	Feed Flow Transmitter Failure/Bus 11 Failure/LOCA/ATWS	July 25, 2002
QGA 100	RPV Control	Revision 7
QGA 101	RPV Control (ATWS)	Revision 10
QGA 500-1	RPV Blowdown	Revision 11

3PP3 Physical Protection

LS-AA-125	Exelon Nuclear Corrective Action Program (CAP) Procedure	Revision 2
	Supplemental Safeguards Contingency Plan	Revision 23
SY-AA-101-102	Compensating for Security System Failures	Revision 1
SY-AA-101-106	Control and Classification of Safeguards Information	Revision 1
SY-AA-101-108	Response to Events Maliciously Directed at Plant Safety or Security	Revision 1
SY-AA-101-109	Response to Contingency Events	Revision 2
SY-AA-101-111	Security Threat Advisory Levels	Revision 1
SY-AA-101-124	Operation of the Security Control Centers	Revision 1
SY-AA-101-132	Threat Assessment	Revision 2
Lesson Plan (LP) OSSC	Security Control Center Operations	Revision 0
LP SCCE	Security Control Center Evacuation	Revision 0

LP SCE	Security Contingency Events	Revision 0
LP BSC	Stress Fire Course Exercise	Revision 2
LP 1.1	Response Team Leader	Revision 0
	Force on Force Exercise Critiques	November 2000 - April 2002
Training Records	Weapons Qualifications, Stress Fire, Force on Force, Deadly Force, and Table Tops	July 2001 - July 2002
Condition Report 90857	Delivery Vehicle Hit Cement Jersey Barrier	January 16, 2002
Condition Report 93635	Improperly Controlled Safeguard Information	February 3, 2002
	Security Event Report	July 2001 - July 2002
Nuclear Oversight (NO) Field Observation NOA-QC-01-4Q	Safeguard Advisory Actions	October - November 2001
N.O. Field Observation NOA-QC-02-1Q	Security Training	February 21, 2002
N.O. Field Observation NOA-QC-02-2Q	Security Force on Force Drills	March 22 - 24, 2002
N.O. Field Observation NOA-QC-02-2Q	Security Post - 9/11 Assessment (Phase 1)	May 3, 2002
N.O. Field Observation NOA-QC-02-2Q	Security Post - 9/11 Assessment (Phase 2)	May 13 - 17, 2002
	N.O. Continuous Assessment Report NOA-QC-02-2Q April - June 2002	July 25, 2002
Security Self-Assessment Report	Pre-NRC Inspection of 71130.03, Response to Contingency Events (Protective Strategy and Implementation of Protective Strategy)	July 8 - 15, 2002

4OA1 Performance Indicator Verification

Number	Subject/Title	Date/Revision
	NRC Inspection Reports	June 2001 - June 2002
	Licensee Event Reports	June 2001 - June 2002
LS-AA-2080	Monthly Performance Indicator Data Elements for Safety System Functional Failures	July 2001 - May 2002
	Various Condition Reports	June 2001 - June 2002
LS-AA-2060	Monthly Performance Indicator Data Elements for Reactor Core Isolation Cooling (BWRs) or Auxiliary Feedwater (PWRs) Systems	June 2001 - June 2002
LS-AA-2040	Monthly Performance Indicator Data Elements for Safety System Unavailability - Emergency AC Power	June 2001 - June 2002

4OA2 Problem Identification and Resolution

Number	Subject/Title	Date/Revision
QDC-28987	Failure Analysis of the 1A Core Spray Room Cooler Bearing, Component 1-5748-A, SKF; 6206-2Z/C3HT51, Quad Unit No. 1	August 20, 2002
QCEPM 0400-07	Motor Lubrication	Revision 17
NRC Inspection Manual Part 9900	Operable/Operability Ensuring the Functional Capability of a System or Component	
Condition Report 117266	Breaker for 1A Core Spray Room Cooler Found in a Tripped Condition	July 28, 2002
Condition Report 119601	Preliminary Cause of 1A Core Spray Room Cooler Bearing Failure	August 16, 2002
Condition Report 120019	Inadequate Extent of Condition Review for 1A Core Spray Room Cooler Bearing Failure	August 20, 2002
QCEMS 0250-06	Exhaust Fan and Room Cooler Motor Environmental Qualification Surveillance	Revision 9
NRC Information Notice 88-12	Overgreasing of Electric Motor Bearings	April 12, 1988

NRC Information Notice 94-51	Inappropriate Greasing of Double Shielded Motor Bearings	July 15, 1994
	Vibration Monitoring Results for the 1A Core Spray Room Cooler Motor Bearings	November 1998 - July 2002
Procedure LS-AA-105	Operability Determinations	Revision 0
Procedure LS-AA-125	Corrective Action Program	Revision 3
Apparent Cause Report for Condition Report 117266	Apparent Cause Evaluation for the Bearing Failure of the 1A Core Spray Room Cooler Motor Bearing	September 9, 2002
NRC Generic Letter 91-18	Degraded and Nonconforming Conditions	Revision 1
OP-AA-102-104	Pertinent Information Program	Revision 0
Standing Order 02-006	Compensatory Measures for 2A RHR Room Cooler Alternate Power Supply	August 23, 2002
HU-AA-104-101	Procedure Use and Adherence	Revision 0
AD-AA-101	Processing of Procedures and T&RMs	Revision 12
QCARP 0030-05	TB-1 Injection with SSMP and Bringing the Unit to Cold Shutdown	Revision 2
QCARP 0040-02	24-1 Injection with SSMP and Bringing the Unit to Cold Shutdown	Revision 3
QCARP 0060-02	CT-2 Injection with SSMP and Bringing the Unit to Cold Shutdown	Revision 3
LS-AA-104-1000		Revision 0
Condition Report 123180	OP-AA-102-104 Misapplied During Development of Standing Order	September 17, 2002
Condition Report 123870	Misapplication of 10 CFR 50.59 Applicability Information	September 20, 2002

4OA3 Event Followup

Number	Subject/Title	Date/Revision
Condition Report 114775	Increased Reactor Pressure	July 9, 2002
Condition Report 115502	Foreign Material Identified in the Unit 2 A Main Steam Line	July 13, 2002

Condition Report 115420	Main Steam Drain Line Tie-Back Pipe Support Clamp Bolts Found Loose	July 12, 2002
Condition Report 115510	Steam Dryer Found Damaged During Visual Inspection	July 12, 2002
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Condition Report 115692	Tie-Back Support #3 6 2-3001D	July 15, 2002
Condition Report 115500	Indications (Gouges) Were Discovered Around the Unit 2 A Main Steam Line Nozzle	July 12, 2002
Exelon Nuclear Letter RS-01-162	Additional Mechanical Information Supporting the License Amendment Request to Permit Uprated Power Operation at Dresden Nuclear Power Station and Quad Cities Nuclear Power Station	August 13, 2001
Condition Report 102589	Reactor Scram due to Increasing RPV Water Level	April 9, 2002