

January 29, 2004

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, UNITS 1 AND 2  
NRC INTEGRATED INSPECTION REPORT 05000254/2003013;  
05000265/2003013

Dear Mr. Skolds:

On December 31, 2003, the U. S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Quad Cities Nuclear Power Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on January 6, 2004, 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). Two 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 V1.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulation Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 801 Warrenville Road, Lisle, IL 60532-4351; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Quad Cities Nuclear Power Station.

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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 05000254/2003013; 05000265/2003013  
w/Attachment: Supplemental Information

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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REGION III

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

Report No: 05000254/2003013; 05000265/2003013

Licensee: Exelon Nuclear

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

Location: 22710 206th Avenue North  
Cordova, IL 61242

Dates: October 1 through December 31, 2003

Inspectors: K. Stoedter, Senior Resident Inspector  
M. Kurth, Resident Inspector  
M. Bielby, Operator Licensing Examiner  
M. Holmberg, Reactor Engineer  
J. House, Radiation Protection Inspector  
H. Peterson, Operator Licensing Examiner  
T. Ploski, Senior Emergency Preparedness Inspector  
B. Winter, Reactor Engineer  
C. Zoia, Operator Licensing Examiner  
R. Ganser, Illinois Emergency Management Agency

Observer: L. Ramadan, Nuclear Safety Intern

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000254/2003013, 05000265/2003013; 10/01/03-12/27/03; Quad Cities Nuclear Power Station, Units 1 & 2; Internal Flooding, Maintenance Effectiveness, Non-Routine Evolutions, and Outages and Refueling.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on licensed operator requalification, maintenance rule, heat sinks, emergency preparedness, and radiation protection. The inspection was conducted by Region III inspectors and the resident inspectors. Two Non-Cited Violations (NCVs) and four Green findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP 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. Inspector-Identified and Self-Revealing Findings**

#### **Cornerstone: Initiating Events**

- Green. A self-revealing reactor recirculation runback occurred on October 7 due to a loose screw on terminal BB-13 in control room panel 901-18. The screw was likely loosened during modification work conducted in November 2002. The runback and associated control room operator actions resulted in lowering Unit 1 reactor power approximately 70 percent.

This finding was determined to be more than minor because it was a precursor to a significant event (the runback). The inspectors determined that this finding was of very low safety significance because the finding did not contribute to the likelihood of a primary or secondary loss of coolant accident initiator, the likelihood of a reactor trip and that mitigating equipment would not be available, or the increase in the likelihood of a fire or an internal or external flooding event. (Section 1R14.1)

#### **Cornerstone: Mitigating Systems**

- Green. A self-revealing event occurred on April 17, 2003, due to the failure to have procedures appropriate to the circumstances for placing a residual heat removal pump in the shutdown cooling mode of operation. When taken in conjunction with a degraded relief valve, the inadequate procedural guidance increased the pressure in the residual heat removal piping to a level which exceeded the relief valve setpoint. The discharge from the relief valve traveled to the reactor building floor drain sump and was unnoticed by control room and radwaste operations personnel for more than 10 hours due to weaknesses in control room and radwaste panel monitoring. By the time this condition was identified, the floor drain sump had overflowed and approximately one-half inch of water had accumulated on portions of the reactor building basement floor. The failure to have a procedure appropriate to the circumstance was determined to be a violation of

NRC requirements. The inspectors considered the weakness in panel monitoring by both control room and radwaste operations personnel to be a human performance issue since this delayed the identification of this self-revealing condition. Lastly, the failure of the licensee to identify the weaknesses in operator performance prior to prompting by the inspectors was considered a problem identification and resolution issue.

This finding was more than minor because it was associated with the procedure quality and protection against external factors attributes of the mitigating systems cornerstone. In addition, this finding impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences such as flooding. The inspectors determined that this finding was of very low safety significance as adequate decay heat removal and mitigating systems capability was maintained. (Section 1R06)

- Green. The inspectors identified a Green finding involving a Non-Cited Violation for the failure to demonstrate effective control of the condition of the reactor building floor drain sump high level alarms through the performance of preventive maintenance. As a result, the licensee had not set goals or monitored the performance of the alarms as required by 10 CFR Part 50.65(a)(1).

This finding was determined to be more than minor because if left uncorrected the failure to perform appropriate preventive maintenance would become a more significant safety concern. Due to the nature of this finding, it was unable to be assessed using the Significance Determination Process. However, the details of this finding were reviewed by Region III management, maintenance rule personnel in the Office of Nuclear Reactor Regulation, and Office of Enforcement personnel and determined to be of very low risk significance. (Section 1R12.1)

- Green. A self-revealing finding was identified due to the failure of the steam dryer monitoring plan to detect significant Unit 1 dryer degradation in the early stages. As a result, actions which could have been taken to preclude the generation of loose parts, and minimize potential damage to mitigating systems equipment, were unable to be taken.

This finding was determined to be more than minor because it impacted the equipment performance attribute of the mitigating systems cornerstone and impacted the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that this finding was of very low safety significance as the dryer failure did not result in the loss of safety function of any mitigating systems equipment. (Section 1R20.2)

## **B. Licensee-Identified Violations**

None.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period operating at full power. On October 7 operations personnel experienced a runback of the 1A reactor recirculation pump due to a loose screw in the pump's speed control circuitry. The runback and the associated operator actions resulted in lowering Unit 1 reactor power to approximately 20 percent. After tightening the screw, operations personnel returned Unit 1 to full power. On October 26 engineering personnel identified a redistribution of main steam line flows. Five days later, chemistry personnel identified an increasing trend in moisture carryover and possible steam dryer degradation. Operations personnel reduced Unit 1 reactor power to 85 percent to limit the steam dryer degradation. On November 12 operations personnel shut down Unit 1 to inspect the steam dryer. In addition to the dryer repairs, the licensee identified and repaired two pieces of equipment which had contributed to an increase in drywell unidentified leakage prior to the shutdown. Unexpected vibrational issues on the electromatic relief valves were also assessed.

Unit 1 returned to power operations on November 30. The licensee limited Unit 1 power levels to 85 percent until vibration information was obtained from multiple accelerometers installed during the shutdown. Not long after starting up, the licensee identified that several of the accelerometers were not providing meaningful data. The licensee conducted a short outage on December 20 to repair the accelerometers. Unit 1 returned to service on December 21 and operated at 85 percent power until December 30 when operations personnel increased Unit 1 power to 96 percent to obtain additional information from the accelerometers. Operations personnel returned Unit 1 to 85 percent power later the same day. Unit 1 operated at this power level for the remainder of the inspection period.

Unit 2 began the inspection period operating at full power. On October 5 operations personnel lowered reactor power to 550 megawatts electric to perform condensate pump maintenance, restore level in a moisture separator drain tank, and complete a control rod pattern adjustment. Operations personnel restored Unit 2 to full power on October 6. Operations performed a control rod pattern adjustment on November 9 which required a power reduction to approximately 80 percent power. Unit 2 returned to full power operations the following day and operated at this power level for the remainder of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity**

##### 1R01 Adverse Weather (71111.01)

###### a. Inspection Scope

The inspectors assessed the licensee's cold weather readiness by conducting detailed inspections on the following equipment:

- Contaminated condensate storage tank heaters; and
- Unit 1 reactor building heating steam coils.



The inspectors selected the contaminated condensate storage tank heaters for inspection because these tanks provide a suction source to the high pressure safety injection, reactor core isolation cooling, and safe shutdown makeup systems. The tank heaters had also experienced long standing material condition issues which included the unexpected tripping of several tank heater breakers in early 2003. The Unit 1 reactor building heating steam coils were chosen for inspection due to material condition issues which had resulted in leaking water onto both Unit 1 safety-related 4160 Volt busses on multiple occasions. The inspectors reviewed the Updated Final Safety Analysis Report, the licensee's seasonal readiness procedures, previously initiated condition reports, cause determinations and modifications packages to assess the licensee's actions in resolving the material condition issues associated with both of the inspection samples. The inspectors compared this information to the licensee's seasonal readiness open items list, system readiness reports and open maintenance work requests to ensure that none of the items on these lists impacted the ability of the contaminated condensate storage tank heaters to perform their function or resulted in degradation of the Unit 1 reactor building heating system which could have impacted the operation of safety-related switchgear.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

Partial Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of the following risk-significant mitigating systems equipment during times when the equipment was of increased importance due to redundant systems or other equipment being unavailable:

- Unit 2 residual heat removal service water system A; and
- Unit 1 reactor core isolation cooling.

The inspectors utilized the valve and electric breaker 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. The inspectors examined the material condition of the components and observed equipment operating parameters to verify that there were no obvious deficiencies. The inspectors reviewed outstanding work orders and condition reports associated with each system to verify that those documents did not reveal issues that could affect the equipment inspected. The inspectors also 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.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors performed routine walkdowns of accessible portions of the following risk significance fire zones:

- Fire Zone 1.1.1.6 - Refueling Floor;
- Fire Zone 1.2.1 - Unit 1 Drywell;
- Fire Zone 2.0 - Control Room;
- Fire Zone 8.2.6.B - Unit 1 Low Pressure Heater Bay 595' Elevation;
- Fire Zone 8.2.7.B - Unit 1 Low Pressure Heater Bay (West) 608.6' Elevation; and
- Fire Zone 8.2.8 - Unit 1 Turbine Floor (Inside Shield Wall).

The inspectors verified that transient combustibles were controlled in accordance with the licensee's procedures. During a walkdown of each fire zone, the inspectors observed the physical condition of fire suppression devices. The inspectors observed the condition and placement of fire extinguishers and hoses against the Pre-Fire Plan fire zone maps. The physical condition of accessible 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.

1R06 Flood Protection (71111.06)

Internal Flooding Review

a. Inspection Scope

The inspectors interviewed operations and engineering personnel, reviewed control room and radwaste operator logs, drawings, condition reports, and associated procedures to determine the circumstances which led to the unexpected lifting of residual heat removal relief valve 2-1001-22B. This item was selected for an internal flooding review because the water discharged from the relief valve overflowed the Unit 2 reactor building floor drain sump and resulted in accumulating approximately one-half inch of water in portions of the Unit 2 reactor building basement.

b. Findings

Introduction: This self-revealing event resulted in a Green finding involving a Non-Cited Violation due to the failure to have a procedure appropriate to the circumstance when placing a residual heat removal pump in the shutdown cooling mode of operation. When taken in conjunction with a degraded relief valve, the inadequate procedural guidance increased the pressure in the residual heat removal piping to a level which exceeded the relief valve setpoint.

Description: On April 16, 2003, Quad Cities Unit 2 experienced an unexpected actuation of a power-operated relief valve and an unplanned shutdown (see Inspection Report 05000265/2003006 for details). Approximately eight hours following the shutdown, operations personnel used QCOP 1000-05, "Shutdown Cooling Operation," to place the 2C residual heat removal pump in shutdown cooling. At this time, reactor pressure was approximately 60 pounds and water temperature was 300° F.

Eleven hours after placing the 2C residual heat removal pump in shutdown cooling the radwaste operator identified that the 2B floor drain sump pump had been running longer than expected. Floor drain collector tank level had also increased. The radwaste operator contacted the unit supervisor to determine the cause of the increase in sump pump run times. Several minutes later the Unit 2 control room operators received the 2B reactor building floor drain sump high level alarm. An equipment operator reported to the sump, identified that the sump was overflowing, and that one-half inch of water had accumulated on a portion of the floor. A subsequent review determined that the sump was overflowing due to actuating residual heat removal relief valve 2-1001-22B. Operations personnel secured the 2C residual heat removal pump which reduced the pressure in the residual heat removal piping, allowed the relief valve to close, and stopped the discharge of water to the reactor building floor drain sump. Condition Report 154400 was initiated to document the relief valve actuation and the sump overflow.

The inspectors reviewed the apparent cause report for Condition Report 154400. The apparent cause report stated that relief valve 2-1001-22B was likely degraded prior to April 16. However, the licensee found that procedural guidance for placing a residual heat removal pump in shutdown cooling instructed operations personnel to start the pump with the pump discharge valve closed. A subsequent calculation performed by engineering showed that starting the pump with the discharge valve closed, reactor pressure at approximately 60 pounds, and reactor water temperature at 300°F could increase the pressure in the residual heat removal piping above the relief valve setpoint regardless of the material condition of the relief valve.

The inspectors determined that weaknesses in human performance resulted in the failure to identify the actuation of relief valve 2-1001-22B in a more timely fashion. During the review of the apparent cause report for Condition Report 154400, the inspectors noted that a significant amount of time had elapsed between the time the 2C residual heat removal pump was started (and the relief valve actuated) and the time the control room received the 2B reactor building floor drain sump high level alarm. The inspectors discussed whether the actuation of relief valve 2-1001-22B should have been identified earlier by operations personnel. Operations management concluded that this question was not posed during the initial review of this event. As a result, operations personnel initiated Condition Report 175524 to review the operational aspects of this issue.

On November 3 operations personnel completed the apparent cause evaluation for Condition Report 175524. The evaluation results showed that operations personnel were presented with multiple opportunities to identify that relief valve 2-1001-22B had actuated. For example, approximately 6 minutes after starting the 2C residual heat removal pump the control room received the 2D residual heat removal pump high seal leak alarm. This alarm was received four additional times over the next 16 minutes.

Operations personnel followed the guidance in the annunciator response procedure for this alarm and found no abnormalities. A work request was also written to verify that the alarm was properly functioning. During a subsequent review for Condition Report 175524, operations personnel identified that the 2D residual heat removal seal leakoff drain line connected into common piping associated with relief valve 2-1001-22B. As a result, backflow from the relief valve likely entered the seal leakoff line and disturbed the seal leak flow switch which caused the high seal leak alarm. Weaknesses in radwaste control room panel monitoring also resulted in at least two missed opportunities. The inspectors considered the failure to identify these human performance issues as part of the licensee's initial review of this event to be a weakness in problem identification and resolution.

Analysis: The inspectors determined that the failure to have a procedure for starting a residual heat removal pump in the shutdown cooling mode of operation which cautioned operations personnel of the possibility of actuating relief valve 2-1001-22B was more than minor because this finding was associated with the procedure quality and protection against external factors attributes of the mitigating systems cornerstone. In addition, this finding also affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences such as flooding.

The inspectors concluded that the failure to include appropriate guidance in QCOP 1000-05 should be evaluated using the Significance Determination Process described in Inspection Manual Chapter 0609, "Significance Determination Process," because the finding was associated with the operability, availability, reliability, or function of a mitigating system. Since Quad Cities Unit 2 was in cold shutdown when this issue occurred, the inspectors assessed the significance of this issue using Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," Table 1, for boiling water reactors in cold shutdown with a time to boil of less than 2 hours and reactor water level less than 23 feet above the reactor vessel flange. Page T-16 of Table 1 required two residual heat removal shutdown cooling subsystems to be operable with one system in operation. The inspectors determined that the Table 1 requirement was met as the remaining three residual heat removal pumps were available to perform the shutdown cooling function and the 2D pump was placed in service after securing the 2C pump. The inspectors referred to Page T-17 of Table 1 and determined that the failure to have adequate procedural guidance for starting a residual heat removal pump in shutdown cooling without actuating relief valve 2-1001-22B was of very low risk significance (Green) because adequate decay heat removal capability was maintained.

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality be prescribed by documented procedures appropriate to the circumstances. Operating the residual heat removal system in the shutdown cooling mode of operation was an activity that affected quality. Contrary to the above, on April 16, 2003, QCOP 1000-05, "Shutdown Cooling Operation," was not appropriate to the circumstances in that it directed operations personnel to start the residual heat removal pump with the pump discharge valve fully shut. No information was provided regarding the potential to actuate certain relief valves when starting a residual heat removal pump at certain reactor pressures or temperatures. This resulted in actuating relief valve 2-1001-22B, discharging more than 1600 gallons of water to the reactor

building floor drain sump, and overflowing the sump. This violation is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000265/2003013-01)**. This violation is in the licensee's corrective action program as Condition Report 154400. Immediate corrective actions included revising QCOP 1000-05, briefing operations personnel and radwaste operators on the event, and enhancing panel monitoring activities in the main and radwaste control rooms.

1R07 Heat Sink (71111.07B)

.1 Biennial Heat Sink Review

a. Inspection Scope

In response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," the licensee committed to a program for monitoring heat exchanger performance (reference licensee letter dated January 29, 1990). In this letter, the licensee indicated that this program would include maintenance (clean and inspect) or test activities that would ensure satisfactory performance of safety-related heat exchangers.

The inspectors reviewed licensee records associated with inspection, cleaning, and performance trending of the Unit 1A residual heat removal heat exchanger and the Unit 1A residual heat removal service water pump cubicle cooler. The inspectors selected these heat exchangers based upon their importance in supporting required safety functions and relatively high risk achievement worths. Specifically, the inspectors reviewed the licensee's heat transfer related calculations and/or maintenance activities to confirm that the minimum design heat transfer capability was maintained for these heat exchangers, in accordance with licensee commitments to Generic Letter 89-13 and limiting design performance values identified in the Updated Final Safety Analysis Report.

The inspectors also performed a walkdown of the Unit 1 rooms containing the selected heat exchangers. Additionally, the inspectors measured the humidity levels in the 1A residual heat removal service water vault pump room using a wet/dry bulb temperature instrument, to confirm bounding room humidity levels used as an input for the pump cubical cooler thermal performance evaluation.

The inspectors concluded that the documents reviewed for these activities, together with documents reviewed under Section 4OA2.1 of this report constituted two samples for the biennial review of heat sink performance in accordance with Section 71111.07-05 of Procedure 71111.07, "Heat Sink Performance."

b. Findings

No findings of significance were identified.

.2 Routine Review of Identification and Resolution of Problems Associated with Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee corrective action program reports concerning heat exchangers and ultimate heat sink performance issues. Specifically, the inspectors focused on the licensee's corrective actions implemented for silting and biofouling which has occurred in the intake structures supporting the ultimate heat sink, and internal leakage (e.g., reactor coolant leakage into the service water systems) which has occurred in the residual heat removal heat exchangers for each unit. The inspectors reviewed these corrective action program documents to confirm that the licensee had appropriately described the scope of the problems. Additionally, the inspectors' review included confirmation that the licensee had an appropriate threshold for identifying issues and had implemented effective corrective actions. The inspectors performed these reviews to ensure compliance with 10 CFR Part 50 Appendix B, Criterion XVI, "Corrective Action," requirements.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11B)

Biennial Licensed Operator Requalification Inspection

.1 Facility Operating History

a. Inspection Scope

The inspectors reviewed the plant's operating history from November 2001, through October 2003, to assess whether the Licensed Operator Requalification Training program had identified and addressed operator performance deficiencies at the plant.

b. Findings

No findings of significance were identified.

.2 Licensee Requalification Examinations

a. Inspection Scope

The inspectors performed a biennial inspection of the licensee's Licensed Operator Requalification Training program. The inspectors reviewed the 2003 annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The operating examination material reviewed consisted of three operating tests, each containing two dynamic simulator scenarios and five job performance measures. Three of the biennial written examinations were reviewed and each consisted of two sections with a total of 40 open

reference multiple choice questions. One of the two sections required a static simulator scenario to answer the questions. The biennial examinations were conducted in October and November 2003, for the previous 24 months training program. The inspectors reviewed the methodology for developing the examinations, including the Licensed Operator Requalification Training program 2 year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications. The inspectors also reviewed the licensee's program and assessed the level of examination material duplication during the current year annual examinations as compared to the previous year's annual examinations. Additionally, the inspectors interviewed members of the licensee's management, operations, and training staff and discussed various aspects of the examination development.

b. Findings

No findings of significance were identified.

.3 Licensee Administration of Requalification Examinations

a. Inspection Scope

The inspectors observed the administration of the requalification operating test to assess the licensee's effectiveness in conducting the test and to assess the facility evaluators' ability to determine adequate performance using objective, measurable performance standards. The inspectors evaluated the performance of one shift crew in parallel with the facility evaluators during four dynamic simulator scenarios. In addition, the inspectors observed licensee evaluators administer job performance measurements to various licensed crew members. The inspectors observed the training staff personnel administer the operating test, including pre-examination briefings, observations of operator performance, individual and crew evaluations after dynamic scenarios, and the post operating test crew debrief by the training department evaluators. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented under Section 1R11.7, "Conformance With Simulator Requirements Specified in 10 CFR 55.46," of this report. In addition, inspectors also observed actual control room operations and shift turnover activities for one operating crew to assess overall performance compared to performance observed on the simulator during the annual requalification examinations.

b. Findings

No findings of significance were identified.

.4 Examination Security

a. Inspection Scope

The inspectors reviewed the licensee's overall licensed operator requalification examination security program related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias). The inspectors also reviewed the facility licensee's examination security procedure,

TQ-AA-201, Revision 4, "Examination Security and Administration," the corrective actions related to any past and present examination security problems at the facility, and the implementation of security and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the examination process.

b. Findings

No findings of significance were identified.

.5 Licensee Training Feedback System

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining their Licensed Operator Requalification Training program up to date, including the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of its Licensed Operator Requalification Training program and their ability to implement appropriate corrective actions.

b. Findings

No findings of significance were identified.

.6 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous annual requalification examinations and the training planned for the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans.

b. Findings

No findings of significance were identified.

.7 Conformance With Operator License Conditions

a. Inspection Scope

The inspectors reviewed the facility and individual operator licensees' conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53 (e) and (f). The inspectors reviewed the procedural guidance and the



process for tracking on-shift hours for licensed operators and which control room positions were granted credit for maintaining active operator licenses. The inspectors reviewed the facility licensee's Licensed Operator Requalification Training Program to assess compliance with the requalification program requirements as described by 10 CFR 55.59 (c). A previous NRC special inspection conducted June 3, 2003, (Inspection Report 50-254/03-08(DRS); 50-265/03-08(DRS)) reviewed licensed operators' medical records and assessed compliance with the medical standards delineated in American National Standard Institute/American Nuclear Society-3.4, "American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants," and with 10 CFR 55.21 and 10 CFR 55.25.

b. Findings

No findings of significance were identified.

.8 Conformance With Simulator Requirements Specified in 10 CFR 55.46

a. Inspection Scope

The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements as prescribed in 10 CFR 55.46, "Simulation Facilities." The inspectors also reviewed a sample of simulator performance test records (i.e., transient tests, scenario test and discrepancy resolution validation test), simulator discrepancy and modification records, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy process to ensure that simulator fidelity was maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics. The inspectors conducted interviews with members of the licensee's simulator staff about the configuration control process and completed the Inspection Procedure 71111.11, Appendix C, checklist to evaluate whether or not the licensee's plant-referenced simulator was operating adequately as required by 10 CFR 55.46 (c) and (d).

b. Findings

No findings of significance were identified.

.9 Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the annual operating tests and written examinations (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee during calendar year 2003. Year 2003 was the second year of the 2 year training program. The overall operating test and written examination results were compared with the significance determination process in accordance with NRC Manual Chapter 0609I, "Operator Requalification Human Performance Significance Determination Process."

b. Findings

No findings of significance were identified.

.10 Self-Assessment Report Review

a. Inspection Scope

The inspectors reviewed licensee training department self-assessment reports. The licensee's self-assessments reviewed the licensed operator training program prior to this inspection activity. The self-assessments were reviewed to ensure that any issues identified during the self-assessment were appropriately evaluated, prioritized, and controlled.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Quarterly Maintenance Rule Inspections

a. Inspection Scope

The inspectors reviewed the licensee's handling of performance issues and the associated implementation of the Maintenance Rule (10 CFR 50.65) to evaluate maintenance effectiveness for the systems listed below. These systems were selected based on them being designated as risk significant under the Maintenance Rule, being in increased monitoring (Maintenance Rule category a(1) group), or due to an inspector identified issue or problem that potentially impacted system work practices, reliability, or common cause failures:

- Main Steam Valves (Function Z0203); and
- Internal Flooding Protection (Function Z0012).

The inspectors' review included an examination of specific system issues, an evaluation of maintenance rule performance criteria, maintenance work practices, common cause issues, extent of condition reviews, and trending of key parameters. The inspectors also reviewed the licensee's maintenance rule scoping, goal setting, performance monitoring, functional failure determinations, and current equipment performance status.

b. Findings

Introduction: The inspectors identified a Green finding involving a Non-Cited Violation due to the licensee's failure to demonstrate effective control of the condition of the reactor building floor drain sump high level alarms through the performance of preventive maintenance. As a result, the licensee had not set goals or monitored the performance of the high level alarms as required by 10 CFR 50.65(a)(1).

Description: Part 50.65(b)(2)(i) of 10 CFR required that equipment used in a licensee's emergency operating procedures be included in the maintenance rule. The reactor building floor drain sump high level alarms at Quad Cities were included within the scope of the maintenance rule since they warned operations personnel of an internal flooding condition which may require entering emergency operating procedure QGA 300, "Secondary Containment Control." Operations personnel would enter this emergency operating procedure if the sump level alarm annunciated and greater than 1 inch of water was found on the reactor building basement floor.

The reactor building floor drain system consisted of two sumps with a sump pump in each sump. The sumps are located on opposite ends of the basement. On April 17, 2003, the 2B reactor building floor drain sump overflowed (see Section 1R06 for details). The operations department's sequence of events indicated that the 2B reactor building floor drain sump high level alarm was not received in a timely manner. Specifically, sump pump run times showed that water in the 2B floor drain sump had overflowed the sump, migrated to the other end of the reactor building basement, and began filling the 2A sump prior to receiving the 2B reactor building sump high level alarm. Once the alarm was received, operations personnel responded to the reactor building basement and found approximately one-half inch of water on a portion of the floor.

The inspectors interviewed operations, engineering, and maintenance personnel to determine whether the reactor building floor drain sump high level alarm setpoints were checked on a periodic basis. The inspectors determined that the licensee's current preventive maintenance program did not include a periodic check of each alarm setpoint because a setpoint did not exist. The inspectors then asked for any other preventive maintenance tasks performed on this equipment. The licensee informed the inspectors that operations personnel exercised the float switch for each sump and ensured that the high level alarm was received on a weekly basis. A subsequent review of the weekly exercising determined that operations personnel were not consistently verifying that each alarm was received due to a flaw in the operator rounds software which failed to prompt the operator to perform this check under certain circumstances. The licensee stated that other preventive maintenance activities for this equipment included monitoring the sump pump run times and performing a walkdown of the sump area once every 8 hours to verify the absence of water on the floor. The inspectors concluded that while these additional preventive maintenance activities were essential, taken in the aggregate, they failed to identify the degraded condition of the 2B reactor building floor drain sump high level alarm prior to actual failure.

The inspectors reviewed the reactor building floor drain sump maintenance history to determine the types of maintenance previously performed on this equipment. In March 2003 the 1A reactor building floor drain sump overflowed while draining a separate system for maintenance. During this event, the 1A reactor building floor drain sump high level alarm failed to annunciate due to a loose float switch connecting rod. The inspectors noted that although the weekly float exercising was performed 2 days earlier, this exercising failed to identify the degraded condition of the 1A reactor building floor drain sump high level alarm prior to its failure. The licensee's other preventive maintenance activities also failed to identify this degraded condition. Corrective actions for the March 2003, reactor building floor drain sump overflow included the initiation of work requests to inspect the connecting rods on the remaining sumps for tightness. The

inspectors reviewed each of the work requests and determined that both of the Unit 2 sump connecting rods had been inspected. However, the work requests associated with Unit 1 had not been completed.

During this inspection, engineering personnel presented data which indicated that the 2B reactor building floor drain sump high level alarm may have functioned as expected. Since this information conflicted with previous information provided to the inspectors by the operations department, the inspectors requested that an additional review of the data be performed. After this additional review, the licensee concluded that they were unable to determine whether the sump high level alarm functioned properly on April 17. As a result, the licensee conservatively concluded that the alarm failed to function as expected. The licensee also concluded that their current preventive maintenance program failed to identify the degraded condition of the 2B reactor building floor drain sump high level alarm.

Analysis: The inspectors determined that the failure to demonstrate that the performance or condition of the reactor building floor drain sump high level alarms was being effectively controlled through the performance of appropriate preventive maintenance, such that the alarms remained capable of performing their intended function, was more than minor because if left uncorrected the failure to perform appropriate preventive maintenance would become a more significant safety concern.

The inspectors reviewed NRC Inspection Manual Chapter 0612, Appendix B, "Power Reactor Inspection Report Issue Dispositioning Screening," and Inspection Procedure 71111.12, Appendix A, "Routine Maintenance Effectiveness Inspection Detailed Guidance." The inspectors used these documents to determine that this finding could not be assessed a significance using the Significance Determination Process. This finding was reviewed by Region III management, Maintenance Rule personnel in the Office of Nuclear Reactor Regulation, and Office of Enforcement personnel and was determined to be of very low risk significance (Green).

Enforcement: Title 10 CFR Part 50.65(a)(1), required, in part, that holders of an operating license shall monitor the performance or condition of structures, systems, or components within the scope of the rule as defined by 10 CFR 50.65(b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems, and components are capable of fulfilling their intended functions.

Title 10 CFR 50.65(a)(2) stated, in part, that monitoring as specified in 10 CFR 50.65(a)(1) was not required where it had been demonstrated that the performance or condition of a structure, system, or component was being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system, or component remained capable of performing its intended function.

Contrary to the above, as of December 29, 2003, the licensee had failed to demonstrate that the performance or condition of the reactor building floor drain sump high level alarms was being effectively controlled through the performance of appropriate preventive maintenance in that verification of the sump alarm setpoint was not verified through the performance of a preventive maintenance activity and preventive

maintenance which verified the electrical functionality of the sump alarms was not consistently performed. This resulted in sump alarm failures in March and April 2003. Following these failures, the licensee failed to consider placing the internal flooding protection function (which includes the reactor building floor drain sump high level alarms) under 10 CFR 50.65(a)(1) for establishing goals and monitoring against these goals. This violation is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy (**NCV 05000254/2003013-02; 05000265/2003013-02**). This violation is in the licensee's corrective action program as Condition Report 185418. Corrective actions for this issue included capturing this issue as part of the licensee's maintenance rule information and developing and implementing a preventive maintenance activity which verified on a periodic basis that the high level alarm actuated prior to overflowing the reactor building floor drain sump.

.2 Maintenance Effectiveness Periodic Evaluation (71111.12B)

a. Inspection Scope

The inspector examined the periodic evaluation report completed for the time period of May 2000 through May 2002. To evaluate the effectiveness of (a)(1) and (a)(2) activities, the inspector examined a number of Quad Cities (a)(1) action plans, functional failures, and condition reports. These same documents were reviewed to verify that the threshold for identification of problems was at an appropriate level and the associated corrective actions were appropriate. Also, the maintenance rule program documents were reviewed. The inspectors focused the inspection on the following four systems (samples):

- Residual Heat Removal;
- Residual Heat Removal Service Water;
- Low Pressure Coolant Injection; and
- High Pressure Coolant Injection.

The inspector verified that the periodic evaluation was completed within the time restraints defined in 10 CFR 50.65 (once per refueling cycle, not to exceed 2 years). The inspector also ensured that the licensee reviewed its goals, monitored structures, systems, and components (SSCs) performance, reviewed industry operating experience, and made appropriate adjustments to the maintenance rule program as a result of the above activities.

The inspector verified that the licensee balanced reliability and unavailability during the previous refueling cycle, including a review of safety significant SSCs.

The inspector verified that (a)(1) goals were met, that corrective action was appropriate to correct the defective condition, including the use of industry operating experience, and that (a)(1) activities and related goals were adjusted as needed.

The inspector verified that the licensee has established (a)(2) performance criteria, examined any SSCs that failed to meet their performance criteria, and reviewed any

SSCs that have suffered repeated maintenance preventable functional failures including a verification that failed SSCs were considered for (a)(1).

In addition, the inspectors reviewed maintenance rule self-assessments that addressed the maintenance rule program implementation.

b. Findings

No findings of significance were identified.

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 listed activities agreed with the results provided by the licensee’s risk assessment tool. In each case, the inspectors conducted 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.

- Work Week October 6 through 11, including Unit 2 “C” residual heat removal service water system maintenance, and Unit 1 “A” reactor recirculation system emergent maintenance;
- Work Week October 13 through 18, including Unit ½ emergency diesel generator emergent maintenance;
- Work Week October 20 through 25, including Unit 1 high pressure coolant injection system maintenance, Unit 2 turbine building closed cooling water maintenance, and emergent issues on the Unit 2 reactor building closed cooling water system; and
- Work Week December 8 through 12, including Unit 2 reactor core isolation cooling system maintenance, Unit 2 “B” core spray room cooler maintenance, Unit 2 “B” residual heat removal service water emergent maintenance, and Unit ½ “A” standby gas treatment system maintenance.

b. Findings

No findings of significance were identified.

## 1R14 Non-Routine Evolutions (71111.14)

### .1 Review of Response to Reactor Recirculation Runback

#### a. Inspection Scope

On October 7 Unit 1 experienced a runback of the 1A reactor recirculation pump to minimum speed. The runback resulted in an unplanned power reduction of greater than twenty percent. The inspectors reported to the control room to monitor the operators' response to this transient. The inspectors also attended several meetings to observe the licensee's efforts to determine the root cause of the runback, troubleshooting activities, and the associated corrective actions. Following the transient, the inspectors reviewed multiple procedures utilized during the transient response to ensure that the operators' actions were in accordance with plant procedures.

#### b. Findings

Introduction: A Green finding was self-revealed when a reactor recirculation pump inadvertently decreased in speed (runback) while the unit was at a full electrical power condition due to a loose screw in a terminal strip. The finding was not considered a violation of regulatory requirements since the loose screw was associated with non-safety related circuitry.

Description: While operating at full electrical power, the Unit 1 control room operators received an alarm indicating a problem with reactor recirculation loop 1A. Immediately after receiving the alarm, the 1A reactor recirculation pump ran back to 32 percent speed. Operators immediately entered the abnormal operating procedures and sequentially inserted control rods as directed by the procedures. Operations personnel stabilized reactor power at approximately 20 percent power while troubleshooting activities were planned and initiated.

The licensee identified a loose terminal screw at location BB-13 in control room panel 901-18. The terminal point was electrically associated with a relay that provided both the control room annunciator and the runback signal for reactor recirculation pump 1A. Upon discovery, maintenance personnel tightened the screw. Following this activity, the control room annunciator cleared and the runback signal was removed.

The inspectors reviewed the licensee's corrective action documents for this event and determined that terminal point BB-13 was likely last touched during modification work performed in November 2002. The inspectors verified that the licensee checked other terminal points which may have been contacted during this modification work. No other loose terminal points were found.

Analysis: The inspectors determined that the failure to adequately secure terminal connections which subsequently impacted plant operations was more than minor because it could be reasonably viewed as a precursor to a significant event (a transient). The inspectors also determined that this finding should be evaluated using the Significance Determination Process described in Inspection Manual Chapter 0609, "Significance Determination Process," because the finding increased the likelihood of

having a plant transient. The inspectors conducted a Phase 1 Significance Determination Process screening and determined that this finding was of very low safety significance (Green) because it did not contribute to: (1) the likelihood of a primary or secondary loss of coolant accident; (2) the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available; or (3) increase the likelihood of a fire or internal/external flood (**FIN 050000254/2003013-03**).

Enforcement: This issue was not subject to NRC enforcement because the reactor recirculation pump and associated equipment are non-safety related components. The licensee initiated Condition Report 179699 to document this event. Corrective actions included verifications that additional terminal points were secure. Also the licensee identified a number of loose terminal screws that have been identified in the recent past (Condition Report 179699) and has considered updating training and procedures to prevent recurrence.

.2 Review of Unexpected Change in Unit 1 Moisture Carryover

a. Inspection Scope

On October 26 engineering personnel identified a slight increase in flow on Unit 1 main steam line D with a corresponding flow decrease in the remaining three steam lines. Approximately 5 days later, chemistry and operations personnel identified an increase in moisture carryover in that moisture carryover levels exceeded 0.1 percent. The licensee conducted additional moisture carryover sampling to confirm the increase in carryover levels and assess the significance of the Unit 1 steam dryer degradation. The inspectors interviewed operations personnel and licensee management, reviewed control room logs, and examined previous moisture carryover results to determine the sequence of events prior to the increase in moisture carryover. The inspectors also attended several meetings to obtain additional information on the potential dryer damage and assess the licensee's decision making process regarding the need for a Unit 1 power reduction.

b. Findings

No findings of significance were identified. Additional information regarding the Unit 1 dryer is discussed in Section 1R20.2.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors assessed the following operability evaluations or condition reports associated with equipment operability issues:

- Condition Report 177249, Station Public Address System Issue;
- Operability Evaluation 168367-08, Unit 1 Steam Dryer Degradation, Revision 1;



- Condition Report 180661, Loss of High Pressure Coolant Injection Room Cooler Fan - Appendix K and Environmentally Qualified;
- Operability Evaluation 188333-08; Evaluation of Lost Steam Dryer Pieces on Unit 1 Operation, Revision 1; and
- Operability Evaluation 190513-08; Effects of Degraded Sample Probe on Operation of the Feedwater Level Control, Condensate, and Condensate Booster Systems.

The inspectors reviewed the technical adequacy of the evaluations against the Technical Specifications, Updated Final Safety Analysis Report, and other design information; determined whether compensatory measures, if needed, were taken; and determined whether the evaluations were consistent with the requirements of LS-AA-105, "Operability Determination Process," Revision 0.

In addition, the inspectors reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors assessed the following two operator workaround issues to determine the potential effects on the functionality of the corresponding mitigating systems. During these inspections, the inspectors reviewed the technical adequacy of the workaround documentation against the Updated Final Safety Analysis Report and other design information to assess whether the workarounds conflicted with any design basis information. The inspectors also compared the information in abnormal or emergency operating procedures to the workaround information to ensure that the operators maintained the ability to implement important procedures.

- OWA 03-013; 1B Recirculation Motor Generator Set Voltage Regulator Volts/Hertz Swing; and
- Cumulative Review of all Operator Workarounds.

b. Findings

No findings of significance were identified.

## 1R19 Post Maintenance Testing (71111.19)

### a. Inspection Scope

The inspectors reviewed the post maintenance testing activities listed below during the inspection period:

- The performance of QCOS 5750-09, "Emergency Core Cooling System Room and Diesel Generator Cooling Water Pump Cubicle Cooler Monthly Surveillance," following replacement of the High Pressure Coolant Injection Room Cooler Tube Bundle;
- The performance of QCOS 6600-43, "Unit ½ Emergency Diesel Generator Load Test," following replacement of the electronic speed sensing board; and
- The performance of QCOS 0203-03, "Main Steam Relief Valves Operability Test," following maintenance on the 3B and 3E electromatic relief valves.

For each post maintenance 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 post maintenance test activity adequately tested the safety function(s) affected by the maintenance, that 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 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 Activities (71111.20)

### .1 Review of Reactor Building Crane Licensing Basis Information

#### a. Inspection Scope

During a previous inspection at Dresden Station, a regional inspector questioned the licensee regarding the licensing basis for the Unit 2/3 reactor building overhead crane. The inspector determined that the licensee's understanding of the licensing basis for the crane differed from his understanding. In order to achieve a resolution to this issue, Region III personnel initiated a task interface agreement which requested that the Office of Nuclear Reactor Regulation (NRR) review the licensing basis and determine the maximum load which could be lifted using the reactor building crane. The Office of Nuclear Reactor Regulation determined that the Dresden reactor building overhead crane was licensed to lift loads up to 110 tons. Since the licensing basis documents

reviewed by NRR also applied to Quad Cities, the inspectors discussed this issue with licensee personnel, observed the licensee's actions to determine the actual weight of the largest load lifted by the reactor building crane, and reviewed the corrective actions implemented to ensure that loads greater than 110 tons were appropriately controlled by procedures or other administrative requirements.

b. Findings

No findings of significance were identified.

.2 Review of Unit 1 Steam Dryer Outage Activities

a. Inspection Scope

The inspectors reviewed the licensee's outage schedule, verified equipment alignments, and observed control room and outage activities. The inspectors verified that the licensee effectively conducted the shutdown; managed elements of risk pertaining to reactivity control during and after the shutdown; and implemented decay heat removal system procedure requirements as applicable.

The inspectors performed the following activities daily:

- attended control room operator and outage management turnover meetings to verify that the current shutdown risk status was well understood and communicated;
- performed walkdowns of the main control room to observe the alignment of systems important to shutdown risk;
- performed periodic walkdowns of the turbine and reactor buildings to observe ongoing work activities;
- maintained an awareness of inspection and repair activities associated with the steam dryer; and
- reviewed selected issues that the licensee entered into its corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

Additionally, the inspectors observed the following specific activities, as appropriate:

- shutdown and cooldown to a cold shutdown condition (MODE 4);
- implementation of abnormal operating procedures to address any abnormal occurrences;
- initiation of the shutdown cooling mode of the residual heat removal system;
- control rod withdrawals to criticality and portions of the plant power ascension;
- surveillance tests throughout the duration of the outage;
- troubleshooting efforts for emergent plant equipment issues;
- reactor vessel disassembly and reassembly; and
- drywell closeout.

b. Findings

Introduction: One Green finding was identified due to the failure of the licensee's monitoring plan to detect significant Unit 1 dryer degradation in the early stages such that actions could be taken to preclude a failure of the dryer which could have impacted the function of safety-related components.

Description: In June 2002, the licensee experienced a Unit 2 steam dryer cover plate failure due to high cycle fatigue caused by high frequency acoustic resonance. Corrective actions for this failure included modifying the steam dryer cover plates and completing an extent of condition review on the remaining steam dryer components. Approximately 1 year later, the licensee experienced a second Unit 2 steam dryer failure due to high cycle fatigue resulting from low frequency pressure oscillations. Corrective actions following the second failure included repairing the steam dryer, conducting an additional extent of condition review which included the full spectrum of frequencies acting upon the dryer, and implementing a steam dryer monitoring plan to better assess steam dryer degradation.

The steam dryer was a non-safety related component. However, the steam dryer was required to maintain its structural integrity to ensure the continued operability of safety-related equipment. As a result, the steam dryer monitoring plan was developed to detect dryer degradation in the early stages such that actions could be taken to preclude a dryer failure which impacted the function of any safety-related equipment or components. The inspectors reviewed the plan and determined that operations and engineering personnel were required to monitor reactor parameters which had changed prior to the two previous dryer failures. The parameters monitored included moisture carryover, reactor power, reactor pressure, reactor water level, main steam line flows, and multiple other parameters. Some of the parameters were monitored at least weekly; however, many of the parameters were monitored hourly.

On October 7 the licensee experienced a reactor recirculation system runback on the 1A reactor recirculation pump. The changes in reactor recirculation system flow could have created a flow differential in the reactor which may have changed the forces acting upon the steam dryer. However, the licensee did not immediately recognize the potential impacts of the runback on the structural integrity of the dryer.

On October 26 engineering personnel identified a redistribution of main steam line flows using the steam dryer monitoring plan. Engineering personnel collected several other pieces of information to try and determine whether the redistribution of main steam line flows was the first indication of possible Unit 1 steam dryer degradation. Approximately five days later, the licensee identified increases in moisture carryover levels which exceeded the 0.1 percent threshold contained in the steam dryer monitoring plan. The results of a confirmatory sample also showed an increase in moisture carryover levels above 0.1 percent. The licensee reduced Unit 1 reactor power to pre-extended power uprate power levels on November 3 in an attempt to minimize the steam dryer damage.

Approximately 1 week later, the licensee shut down Unit 1 to inspect and repair the steam dryer. During the dryer inspections, the licensee identified a large crack in the outer bank hood on the 270 degree side of the dryer. The licensee also identified that a

6.5 inches wide by 9 inches long piece of the dryer was missing. Based upon this information, the inspectors determined that the dryer degradation was not in the early stages. Although the licensee took actions to minimize the dryer damage, these actions did not preclude a dryer failure which resulted in the generation of loose parts that could have impacted the function of safety-related equipment or components.

The licensee inspected multiple pipes, strainers, and other areas in an attempt to locate the missing dryer piece. The piece was not found lodged in any safety-related piping or valves. The licensee identified scratches and gouges on the 1B reactor recirculation pump impeller which indicated that the dryer piece may have traveled through this system and came to rest in the reactor vessel bottom head. The licensee completed a lost parts evaluation and an operability evaluation and determined that Unit 1 could operate with the dryer piece in the reactor vessel bottom head until the next refueling outage or until a 10 CFR 50.59 safety evaluation was performed which addressed the impact of leaving the dryer piece in the bottom head. Members of the Office of Nuclear Reactor Regulation were reviewing the lost parts analysis and operability evaluation at the conclusion of the inspection period.

Following the shutdown, engineering personnel began reviewing other information to determine why the steam dryer monitoring plan had not prevented the generation of loose dryer parts. Prior to this review, the licensee believed that small changes in reactor power, reactor pressure, main steam line flow, moisture carryover or other parameters were the first indication of steam dryer failure. The engineering review focused on main steam line flow information since, in this most recent failure, the main steam line flows changed prior to observing increases in moisture carryover. Engineering personnel completed multiple moving average calculations for each main steam line flow using a set of 25 data points in each calculation. These calculations were performed for each dryer failure. The results of the calculations showed that for each dryer failure the moving averages on at least two of the four main steam lines began diverging prior to the licensee observing changes in any other reactor parameter.

Analysis: The inspectors determined that the failure of the monitoring plan to include the analysis of main steam line flow moving averages to detect the Unit 1 dryer degradation in the early stages, and preclude the generation of loose parts that could impact the function of safety-related components, was more than minor because it impacted the equipment performance attribute of the mitigating systems cornerstone and impacted the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors also determined that this finding should be evaluated using the Significance Determination Process described in Inspection Manual Chapter 0609, "Significance Determination Process," because the failure of the monitoring plan resulted in dryer degradation which impacted the structural integrity of the dryer. This structural integrity was required to ensure the operability of multiple mitigating systems. The inspectors completed the Phase 1 Significance Determination Process Worksheet and concluded that this finding was of very low safety significance (Green) as the dryer failure did not result in the loss of safety function of any mitigating systems equipment (**FIN 05000254/2003013-04**).

Enforcement: This issue was not subject to NRC enforcement action as the steam dryer is a non-safety-related component. The licensee initiated Condition Reports 186471 and 188129 to document this issue. Corrective actions included repairing the steam dryer and conducting an additional review to develop improvements to the steam dryer monitoring plan.

### .3 Electromatic Relief Valve Damage Identified During Unit 1 Dryer Outage

#### a. Inspection Scope

On November 15 the licensee identified that the 1-0203-3B electromatic relief valve (ERV) pilot vent line was sheared off from the pilot assembly. The licensee further examined the 1-0203-3B ERV valve components and identified that the solenoid actuator was significantly damaged. The inspectors considered this issue to be potentially significant since the electromatic relief valves were used to perform the automatic depressurization function when needed. The inspectors monitored the licensee's progress in determining the cause of the degradation by interviewing engineering, maintenance, and operations personnel, attending meetings, and reviewing several condition reports.

#### b. Findings

The inspectors verified that the damaged solenoid actuator was replaced and the pilot vent line was welded in place. In addition, the licensee installed rigid supports on all of the electromatic relief valve solenoid actuators to minimize the likelihood of actuator damage. A review of the remaining valves resulted in the identification of wear on several other actuator components. However, the wear did not impact the ability of the valves to perform their intended function. The inspectors verified that the licensee included the wear information as part of its root cause investigation.

At the conclusion of the inspection, the licensee was conducting a root cause investigation to determine the sequence of events which led to the degradation. In addition, the licensee had not provided a final conclusion regarding the ability of electromatic relief valve 1-0203-3B to perform its function. Therefore this issue was considered to be an Unresolved Item (**URI 05000254/2003013-05**) pending completion of the licensee's root cause investigation and a subsequent review by the inspectors.

### .4 Review of Unit 1 Shutdown to Repair Accelerometers

#### a. Inspection Scope

On December 20 the licensee conducted a short outage to repair the accelerometers installed during a previous shutdown. The inspectors reviewed the licensee's outage schedule and observed control room and outage activities. The inspectors verified that the licensee managed the elements of risk pertaining to reactivity control during and after the shutdown. The inspectors also verified that the decay heat removal system was working as expected. At the conclusion of the outage, the inspectors conducted a drywell walkdown to assess drywell cleanliness prior to resuming power operations.

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 tests listed below:

- QCOS 6620-11; Station Blackout Diesel Generator 1(2) Semi-Annual Remote/Local/Programmable Logic Controller Bypass Emergency Start Test;
- QCIS 0200-38; Unit 1 Division II Low and Low Low Reactor Water Level Analog Trip System Calibration and Functional Test; and
- Work Orders 417280 and 551253; Calibration Check on Pressure Instrument 1-1001-71A; Residual Heat Removal Pump 1A Discharge Pressure Indication Used During Inservice Testing.

The inspectors verified that the structures, systems, and components tested were capable of performing their intended safety function by comparing the surveillance procedure or calibration acceptance criteria and results to design basis information contained in Technical Specifications, the Updated Final Safety Analysis Report, and licensee procedures. The inspectors verified that each test or calibration was performed as written, the data was complete and met requirements, and the test equipment range and accuracy were consistent with the application by observing the performance of the activity. Following work completion, the inspectors conducted walkdowns of the associated areas to verify that test equipment had been removed and that the system or component was returned to its normal standby configuration. The inspectors also reviewed the licensee's processing of Condition Report 182811 which was generated during the inspection.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspector reviewed Revisions 16, 17, and 18 of the Quad Cities Station Annex to Exelon's Standardized Emergency Plan to determine if changes identified in these annex revisions reduced the Plan's effectiveness, pending on-site inspection of the implementation of these changes.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Problem Identification and Resolution for Access Control to Radiologically Significant Areas

a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No. 50-254/03-05; 50-265/03-05 and the current inspection, the inspectors reviewed the licensee's self-assessments, audits, condition reports licensee event reports, and special reports related to the access control program to verify that identified problems were entered into the corrective action program for resolution. This included corrective action reports related to access controls and to any high radiation area radiological incidents that were non-performance indicator events identified by the licensee in high radiation areas <1Rem/hr. Staff members were interviewed and corrective action documents were reviewed to verify that follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

1. Initial problem identification, characterization, and tracking;
2. Disposition of operability/reportability issues;
3. Evaluation of safety significance/risk and priority for resolution;
4. Identification of repetitive problems;
5. Identification of contributing causes;
6. Identification and implementation of effective corrective actions;
7. Resolution of non-cited violations tracked in the corrective action system; and
8. Implementation/consideration of risk significant operational experience feedback.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and verified that problems were entered into the corrective action program and resolved. For repetitive deficiencies and/or significant individual deficiencies identified in problem identification and resolution, the inspectors verified that the licensee's self-assessment activities were capable of identifying and addressing these deficiencies. There were no performance indicator events to review.

b. Findings

No findings of significance were identified.



.2 Job-In-Progress Reviews

a. Inspection Scope

The inspectors evaluated radiological work in an area having significant dose rate gradients to evaluate the application of dosimetry to effectively monitor exposure to personnel and to verify that licensee controls were adequate to protect workers. This work involved diving activities where the dose rate gradients could be severe, requiring multiple dosimeters and enhanced job controls including telemetry.

b. Findings

No findings of significance were identified.

.3 High Risk Significant, High Dose Rate High Radiation Area and Very High Radiation Area Controls

a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No 50-254/03-05; 50-265/03-05 and the current inspection, the inspectors discussed with radiation protection supervisors the controls that were in place for special areas that had the potential to become very high radiation areas during certain plant operations. This was done to determine if these plant operations (drywell work, fuel transfer operations and transversing incore probe manipulations) required communication beforehand with the radiation protection group, so as to allow corresponding timely actions to properly post and control the radiation hazards. During plant walkdowns, the posting and locking of entrances to high dose rate locked high radiation areas and very high radiation areas were reviewed for adequacy.

b. Findings

No findings of significance were identified.

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls (71121.02)

.1 Problem Identification and Resolutions

a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No 50-254/03-05; 50-265/03-05 and the current inspection, the inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the ALARA program to determine if the licensee's overall audit program's scope and frequency for all applicable areas under the Occupational Cornerstone met the requirements of 10 CFR 20.1101(c).

The inspectors verified that identified problems were entered into the corrective action program for resolution and that they had been properly characterized, prioritized, and

resolved. This included dose significant post-job (work activity) reviews and post-outage ALARA report critiques of exposure performance.

Corrective action reports related to the ALARA program were reviewed and staff members were interviewed to verify that follow-up activities had been conducted in an effective and timely manner commensurate with their importance to safety and risk:

1. Initial problem identification, characterization, and tracking;
2. Disposition of operability/reportability issues;
3. Evaluation of safety significance/risk and priority for resolution;
4. Identification of repetitive problems;
5. Identification of contributing causes;
6. Identification and implementation of effective corrective actions;
7. Resolution of non-cited violations tracked in the corrective action system; and
8. Implementation/consideration of risk significant operational experience; feedback.

The inspectors determined that the licensee's self-assessment process identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the plant Updated Final Safety Analysis Report to identify applicable radiation monitors associated with transient high and very high radiation areas including those used in remote emergency assessment. This represents one sample. The inspectors also identified various types of portable radiation detection instrumentation used for job coverage of high radiation area work, and other temporary area radiation monitors currently used in the plant, including continuous air monitors associated with jobs with the potential for workers to receive 50 millirem committed effective dose equivalent. Whole body counters and radiation detection instruments utilized for personnel survey and release from the radiologically controlled area were identified. This represents one sample.

Licensee personnel were observed performing source checks of selected instruments. The inspectors verified current calibration records, operability, and alarm set points (where applicable) of selected instruments including accident range radiation monitors, portable hand-held survey instruments, and personnel monitoring devices. This included an evaluation of operating parameters for instrumentation used for the release of personnel and material from the radiologically restricted area to verify that detection limits were based on adequate count times and low radiological backgrounds so that the typical

instrument sensitivities were achieved. Instrumentation reviewed included, but was not limited to, the following:

QIP-1800-01-S01; Refueling Floor High Range Area Radiation Monitor #2  
QIP-1800-01-S01; Unit 1 TIP Room Area Radiation Monitor #14  
QIP-1800-01-S01; Unit 1 HPCI Room Area Radiation Monitor #16  
QCI-PM-1800-05; Radwaste Mixing Tank Area Radiation Monitor #5  
RP-QC-728; ASP 2/2E  
QCRP 5822-03; PRM-4/PRM5  
Siemens Electronic Dosimeter  
QCRP 5410-09; Whole Body Counter  
RP-QC-703; AMP 100  
Eberline AMS-4 (AM114)  
RP-QC-730; SAM-9  
PM-7 Calibration Report (PM-3)  
RP-QC-704; XETEX Telescan  
QCRP 5823-16; RSO 50E  
QCRP 5822-07; IPM

The inspectors reviewed what actions would be taken when, during calibration or source checks, an instrument was found out of calibration by more than 50 percent. Should that occur, the inspectors verified that the licensee's actions would include a determination of the instrument's previous usages and the possible consequences of that use since the last calibration. The inspectors also reviewed the licensee's 10 CFR Part 61 source term analyses to determine if the calibration sources used were representative of the plant source term and that hard to detect nuclides were scaled into whole body count dose determinations. This represents one sample.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution for Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, condition reports, licensee event reports, and special reports that involved personnel contamination monitor alarms due to personnel internal exposures to verify that identified problems were entered into the corrective action program for resolution. Internal exposure occurrences greater than 50 millirem committed effective dose equivalent (if any) were reviewed to determine if the affected personnel were properly monitored utilizing calibrated equipment, if the data was adequately analyzed, and if internal exposures were properly assessed in accordance with licensee procedures. Licensee audit and self-assessment data were also evaluated to verify that deficiencies and problems with radiation protection instrumentation were identified, characterized, prioritized, and resolved using the corrective action program. This represents one sample.

The inspectors reviewed corrective action program reports related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area. Staff members were interviewed and corrective action documents were reviewed to verify that the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

1. Initial problem identification, characterization, and tracking;
2. Disposition of operability/reportability issues;
3. Evaluation of safety significance/risk and priority for resolution;
4. Identification of repetitive problems;
5. Identification of contributing causes;
6. Identification and implementation of effective corrective actions;
7. Resolution of non-cited violations tracked in the corrective action system; and
8. Implementation/consideration of risk significant operational experience feedback.

This represents one sample.

The inspectors determined that the licensee's self-assessment process identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution. This represents one sample.

b. Findings

No findings of significance were identified.

.3 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors verified that instrument calibrations had not lapsed, reviewed source response check data records on radiation detection instruments staged for use, and observed radiation protection technicians for appropriate instrument selection and self-verification of instrument operability prior to use. This represents one sample.

b. Findings

No findings of significance were identified.

.4 Self-Contained Breathing Apparatus Maintenance and User Training

a. Inspection Scope

Based on requirements contained in the Updated Final Safety Analysis Report, Technical Specifications, and plant procedures, the inspectors reviewed the status, maintenance, and surveillance records of selected self-contained breathing apparatus staged and ready for use in the plant and inspected the licensee's capability for refilling and transporting self-contained breathing apparatus air bottles to and from the control room and operations support center during emergency conditions. The inspectors verified that control room operators and other emergency response and radiation protection

personnel were trained and qualified in the use of self-contained breathing apparatus including personal bottle change-out. This included verification that licensee personnel were trained and qualified to refill air bottles. The inspectors also verified the training and qualification records for selected (more than three) individuals on each control room shift crew and selected (more than three) individuals from each designated department that were currently assigned emergency duties including onsite search and rescue. This represents one sample.

The inspectors reviewed the self-contained breathing apparatus manufacturer's maintenance training certifications for licensee personnel qualified to perform self-contained breathing apparatus maintenance, and verified the qualifications of three self-contained breathing apparatus units currently designated as "ready for service." Maintenance records for the past 5 years for work performed by certified licensee personnel and by qualified vendors on this equipment were reviewed. This included vital component maintenance records for the regulator and low pressure alarm. Maintenance records along with monthly surveillance data for selected self-contained breathing apparatus units and spare air bottles, covering the period since the last inspection of this area, were reviewed to verify that the required maintenance and surveillances had been performed. The inspectors also ensured that the required periodic air cylinder hydrostatic testing was documented, up to date, and that the Department of Transportation required retest air cylinder markings were in place for the three identified self-contained breathing apparatus units as well as other selected self-contained breathing apparatus units and spare bottles. The inspectors reviewed the licensee's maintenance procedures, including those for the low pressure alarm and regulator, along with the self-contained breathing apparatus manufacturer's recommended practices to determine if there were inconsistencies between them. The inspectors also observed licensee staff inspect and refill air bottles to verify compliance with those procedures. This represents one sample.

b. Findings

No findings of significance were identified.

.5 Rescue Capabilities During Use of One-Piece Atmosphere Supplying Respiratory Protection Devices

a. Inspection Scope

The inspectors reviewed the licensee's respiratory protection and confined space entry procedures and discussed their implementation relative to the requirements of 10 CFR 20.1703(f) for standby rescue persons whenever one-piece atmosphere supplying suits or any combination of respiratory protection and personnel protective equipment were used from which the wearer may have difficulty extricating himself.

The inspectors discussed with radiation protection management, the radiation work permit and the ALARA planning process and safety plans for those jobs not performed in confined space atmospheres to formally address work provisions for standby rescuers.

b. Findings

No findings of significance were identified.

**Cornerstone: Public Radiation Safety**

2PS1 Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems  
(71122.01)

.1 Offsite Dose Calculation Manual

a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No 50-254/03-03; 50-265/03-03 and the current inspection, the inspectors reviewed the Radioactive Effluent Release Reports for the years 2001 and 2002, to verify that the radiological effluent program was implemented as described in the Updated Final Safety Analysis Report and the Offsite Dose Calculation Manual. The inspectors reviewed changes made by the licensee to the Offsite Dose Calculation Manual as well as to the liquid and gaseous radioactive waste processing system design, procedures, or operation since the last inspection to verify that changes were documented in accordance with the requirements of the Offsite Dose Calculation Manual, the Technical Specifications, and that any required 10 CFR 50.59 reviews were performed.

The inspectors verified that any system modifications or Offsite Dose Calculation Manual revisions impacting effluent monitoring or release controls did not affect the licensee's ability to maintain effluents ALARA and that any changes to monitoring instrumentation did not result in a non-representative monitoring of effluents. The inspectors also reviewed the licensee's verification and validation records for software used by the licensee for effluent dose calculations.

b. Findings

No findings of significance were identified.

.2 Effluent Monitor Calibrations

a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No 50-254/03-03; 50-265/03-03, the inspectors reviewed calibration records of liquid and gaseous point of discharge effluent radiation monitors and flow measurement devices to verify that instrument calibrations were within the required calibration frequency. The inspectors also reviewed the current effluent radiation monitor alarm setpoint values for agreement with station requirements.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution for Radioactive Gaseous and Liquid Effluents

a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No 50-254/03-03; 50-265/03-03, the inspectors reviewed the licensee's corrective action program including quality assurance audits, self assessments, special reports and condition reports to verify that problems were identified in a timely manner, were entered into the corrective action program for resolution and that the licensee met the requirements of 10 CFR 20.1101(c) and the Radiological Environmental Technical Specifications/Offsite Dose Calculation Manual (RETS/ODCM). The review was also performed to determine that the licensee's self assessment program had identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution.

Condition reports were reviewed for indications of abnormal releases or releases made with inoperable effluent radiation monitors to verify that adequate compensatory sampling was performed at frequencies defined by the RETS/ODCM. This data was also reviewed to verify that for any unmonitored releases the licensee performed an adequate evaluation of the type and amount of radioactive material released and the projected dose to the public.

The inspectors also reviewed condition reports and corrective action reports from the radioactive effluent treatment and monitoring program, interviewed staff and reviewed documents to determine if the follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

1. Initial problem identification, characterization, and tracking;
2. Disposition of operability/reportability issues;
3. Evaluation of safety significance/risk and priority for resolution;
4. Identification of repetitive problems;
5. Identification of contributing causes;
6. Identification and implementation of effective corrective actions;
7. Resolution of non-cited violations tracked in the corrective action system; and
8. Implementation/consideration of risk significant operational experience feedback.

b. Findings

No findings of significance were identified.

## 2PS2 Radioactive Material Processing and Transportation (71122.02)

### .1 Radioactive Waste System Walkdown and Shipment Preparation

#### a. Inspection Scope

The inspectors reviewed the environmental monitoring reports for the years 2001 and 2002 for information on the types and amounts of radiological wastes released or disposed of. Changes to the radwaste processing system, since the previous inspection of this area, were evaluated for any radiological dose impact to the public and to verify that the licensee had reviewed and documented these changes in accordance with 10 CFR 50.59. The inspectors also verified that licensed facilities receiving radwaste material from the licensee were authorized to receive the shipment packages.

The inspectors reviewed the status of any radioactive waste process equipment that was not operational and/or abandoned in place. The inspectors also reviewed the licensee's administrative and physical controls to ensure that the equipment would not contribute to an unmonitored release path or be a source of unnecessary personnel exposure. The adequacy of any changes made to the radwaste processing system including any 10 CFR 50.59 reviews and any potential radiological exposure to the public was evaluated.

#### b. Findings

No findings of significance were identified.

### .2 Identification and Resolution of Problems for Radioactive Material Processing and Transportation

#### a. Inspection Scope

During the NRC inspection documented in NRC Inspection Report No 50-254/02-08; 50-265/02-08, the inspectors reviewed the licensee's special reports, audits, and self-assessments related to the radioactive material and transportation programs to verify that identified problems were entered into the corrective action program for resolution. The inspectors selectively reviewed condition reports for the year 2002, that addressed radioactive waste and radioactive materials shipping program deficiencies, to verify that problems were identified, characterized, prioritized and corrected. The scope of the licensee's audit program was reviewed to verify that it met the requirements of 10 CFR 20.1101(c).

The inspectors also reviewed corrective action reports for the radioactive material and shipping programs since the previous inspection to verify that corrective actions had been implemented. This included a review of repetitive deficiencies or significant individual deficiencies to verify that the licensee's corrective action program was capable of identifying and addressing these deficiencies. Staff members were interviewed and documents were reviewed to verify that the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:



1. Initial problem identification, characterization, and tracking;
2. Disposition of operability/reportability issues;
3. Evaluation of safety significance/risk and priority for resolution;
4. Identification of repetitive problems;
5. Identification of contributing causes;
6. Identification and implementation of effective corrective actions;
7. Resolution of Non-Cited Violations tracked in the corrective action system; and
8. Implementation/consideration of risk significant operational experience feedback.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Program (71122.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most current Annual Environmental Monitoring Report (2002) and licensee assessment results to verify that the Radiological Environmental Monitoring Program was implemented as required by the RETS/ODCM. The inspectors reviewed the report for changes to the Offsite Dose Calculation Manual with respect to environmental monitoring commitments: sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data. The inspectors reviewed the Offsite Dose Calculation Manual to identify environmental monitoring stations and also reviewed licensee self-assessments, audits, licensee event reports, and inter-laboratory comparison program results. Selected sections of the Updated Final Safety Analysis Report were reviewed for information regarding the Radiological Environmental Monitoring Program and meteorological monitoring instrumentation. The scope of the licensee's audit program was evaluated to verify that it met the requirements of 10 CFR 20.1101(c). This represents one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors walked down 50 percent of the air sampling stations and approximately 10 percent of the thermoluminescent dosimeter monitoring stations to verify that they were located as described in the Offsite Dose Calculation Manual and to determine the equipment material condition. This represents one sample.

The inspectors observed the collection and preparation of selected environmental samples (air particulate filters and surface water) and verified that environmental

sampling was representative of the release pathways as specified in the Offsite Dose Calculation Manual and that sampling techniques were in accordance with procedures. This represents one sample.

The inspectors verified that the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the Updated Final Safety Analysis Report, NRC Safety Guide 23, and licensee procedures. The inspectors verified that the meteorological data readout and recording instruments in the control room and at the tower were operable and that readouts of wind speed, wind direction, delta temperature, and atmospheric stability measurements were available on the licensee's computer system, which was available in the Control Room, and that the system was operable. This represents one sample.

The inspectors reviewed each event documented in the Annual Environmental Monitoring Report which involved a missed sample, inoperable sampler, lost thermoluminescent dosimeter, or anomalous measurement for the cause and corrective actions and conducted a review of the licensee's assessment of any positive sample results (none) in which licensed radioactive material was detected above the environmental lower limits of detection. This represents one sample.

The inspectors reviewed any significant changes made by the licensee to the Offsite Dose Calculation Manual as the result of changes to the land census or sampler station modifications since the last inspection. The inspectors reviewed technical justifications for changed sampling locations. The inspectors also verified that the licensee performed the required reviews to ensure that the changes did not affect the ability to monitor the impacts of radioactive effluent releases on the environment. This represents one sample.

The inspectors reviewed the calibration and maintenance records for five air samplers and composite water samplers (none). The inspectors also reviewed calibration records for the environmental sample radiation measurement instrumentation (i.e., count room) and verified that the appropriate detection sensitivities with respect to RETS/ODCM were utilized for counting samples (i.e., the samples meet the RETS/ODCM required LLDs). The inspectors reviewed quality control charts for maintaining radiation measurement instrument status and actions taken for degrading detector performance.

The inspectors reviewed an independent audit and technical evaluation that the licensee performed on the vendor's sampling, analysis, and quality assurance programs including results of the vendor's inter-laboratory comparison program to verify the adequacy of the vendor's programs, the vendor's corrective actions for any identified deficiencies, and the adequacy of environmental sample analyses performed by the vendor for the licensee. The inspectors reviewed the results of the licensee's inter-laboratory comparison program to verify the licensee's ability to perform radiochemical measurements. The inspectors reviewed the licensee's determination of any bias to the data and the overall effect on the Radiological Environmental Monitoring Program. Audit results of the Quality Assurance Program were reviewed to determine whether the licensee met the RETS/ODCM requirements. This represents one sample.

b. Findings

No findings of significance were identified.

.3 Unrestricted Release of Material from the Radiologically Controlled Area

a. Inspection Scope

The inspectors observed the access control point for entrance into the radiologically restricted area, where the licensee monitors potentially contaminated material leaving the radiologically restricted area, and inspected the methods used for control, survey, and release of such material from this area. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use to verify that the work was performed in accordance with plant procedures. This represents one sample.

The inspectors verified that the radiation monitoring instrumentation was appropriate for the radiation types present and was calibrated with appropriate radiation sources. The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material and verified that there was guidance on how to respond to an alarm indicating the presence of licensed radioactive material. The inspectors reviewed the licensee's equipment to ensure the radiation detection sensitivities were consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination and HPPOS-221 for volumetrically contaminated material. The inspectors verified that the licensee performed radiation surveys to detect radionuclides that decay via electron capture. The inspectors reviewed the licensee's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters (i.e., counting times and background radiation levels). The inspectors verified that the licensee had not established a "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high radiation background area. This represents one sample.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems for Radiological Environmental Monitoring Program and Radioactive Material Control Program

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the radiological environmental monitoring program and the radioactive material control program since the last inspection to determine if identified problems were entered into the corrective action program for resolution. The inspectors also verified that the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies identified by the problem identification and resolution process.

The inspectors also reviewed condition reports and corrective action reports related to the environmental sampling, sample analysis and meteorological monitoring instrumentation. Additionally, staff members were interviewed and documents were reviewed to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

1. Initial problem identification, characterization, and tracking;
2. Disposition of operability/reportability issues;
3. Evaluation of safety significance/risk and priority for resolution;
4. Identification of repetitive problems;
5. Identification of contributing causes;
6. Identification and implementation of effective corrective actions;
7. Resolution of Non-Cited Violations tracked in the corrective action system; and
8. Implementation/consideration of risk significant operational experience feedback.

This represents one sample.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

**Cornerstones: Barrier Integrity, Occupational and Public Radiation Safety**

.1 Reactor Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for performance indicators and periods listed below. The inspectors used performance indicator definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the performance indicator data. The following performance indicator was reviewed:

- Reactor Coolant System Specific Activity for Units 1 and 2

The inspectors reviewed Chemistry Department records and selected isotopic analyses (July 2002 through August 2003) to verify that the greatest Dose Equivalent Iodine values obtained during those months corresponded with the values reported to the NRC. The inspectors also reviewed selected Dose Equivalent Iodine calculations to verify that the appropriate conversion factors were used in the assessment as required by Technical Specifications. Additionally, the inspectors observed a chemistry technician obtain and analyze

a reactor coolant sample for Dose Equivalent Iodine to verify adherence with licensee procedures for the collection and analysis of reactor coolant system samples.

b. Findings

No findings of significance were identified.

.2 Radiation Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for performance indicators and periods listed below. The inspectors used performance indicator definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the performance indicator data. The following performance indicators were reviewed:

•Occupational Exposure Control Effectiveness for Units 1 and 2

The inspectors reviewed the licensee's assessment of the performance indicators for occupational radiation safety, to determine if indicator-related data was adequately assessed and reported during the previous four quarters. The inspectors compared the licensee's performance indicator data with the condition report database, reviewed radiological restricted area exit electronic dosimetry transaction records, and conducted walkdowns of accessible locked high radiation area entrances to verify the adequacy of controls in place for these areas. Data collection and analyses methods for performance indicators were discussed with licensee representatives to verify that there were no unaccounted for occurrences in the Occupational Radiation Safety Performance Indicator as defined in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

•RETS/ODCM Radiological Effluent Occurrences for Units 1 and 2

The inspectors reviewed data associated with the RETS/ODCM performance indicator to determine if the indicator was accurately assessed and reported. This review included the licensee's condition report database and selected condition reports generated over the previous four quarters, to identify any potential occurrences such as unmonitored, uncontrolled or improperly calculated effluent releases that may have impacted offsite dose. The inspectors also selectively reviewed gaseous and liquid effluent release data and the results of associated offsite dose calculations and quarterly performance indicator verification records generated over the previous four quarters. Data collection and analyses methods for performance indicators were discussed with licensee representatives to determine if the process was implemented consistent with industry guidance in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

b. Findings

No findings of significance were identified.

**Cornerstones: Mitigating Systems**

.3 Reactor Safety Strategic Area

a. Inspection Scope

The inspectors interviewed licensee personnel and reviewed Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," licensee memoranda, operator logs, condition reports, and previous NRC inspection reports to verify the accuracy of the performance indicators listed below for both units from October 2002 through August 2003:

- High Pressure Coolant Injection System Unavailability
- Reactor Core Isolation Cooling System Unavailability

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors also conducted a daily review of condition reports to ensure that proposed corrective actions would address the condition adverse to quality and determine whether corrective actions would be implemented in a timely manner. Minor issues entered into the licensee's corrective action system as a result of inspectors' observations are included in the list of documents reviewed which is attached to this report.

b. Findings

No findings of significance were identified. However, other corrective action program issues are discussed in the sections below.

.2 Review of Corrective Action Program Implementation

a. Inspection Scope

During the inspection period, the inspectors monitored the licensee's corrective action program implementation by observing licensee activities, attending meetings, and performing followup activities after conditions adverse to quality were identified by the inspectors.

b. Observations

The inspectors determined that the licensee's corrective action program implementation was generally acceptable. However, three examples of inconsistent implementation were identified.

In July 2002, the licensee experienced an unexpected failure of the 2A reactor recirculation pump field breaker to open. The licensee determined that the breaker failure likely occurred due to the breaker's shunt trip paddle coming into contact with the breaker frame. Corrective actions for this issue included testing by the breaker manufacturer, an extent of condition review, and revising the breaker inspection and test procedure to ensure that the possibility of another breaker failure was minimized.

Between January and September 2003, maintenance personnel revised the breaker inspection and testing procedure three times as part of the corrective actions for the 2002 breaker failure. The resident inspectors reviewed the first revision and determined that the licensee had added procedure steps to ensure that the shunt trip paddle was not contacting the breaker frame. However, the procedure was silent regarding the actions to be taken if evidence of contact was identified. The licensee revised the procedure a second time based upon the inspectors' comments. The inspectors reviewed the second revision and determined that the new procedure steps would not have been performed because the new steps were placed after steps which directed the procedure user to other sections. In September 2003, the licensee revised the breaker inspection and test procedure for the third time. The inspectors determined that the third revision appropriately incorporated the corrective actions from the 2002 breaker failure.

Following the second procedure revision, the inspectors began questioning maintenance and management personnel regarding the need for a condition report which documented the previously implemented and inadequate procedure revisions. Maintenance personnel subsequently initiated Condition Report 179890 on September 29, 2003.

On October 15, 2003, a Region III inspector performed a walkdown of the condensate system with a representative of the licensee's design engineering department as part of the NRC's License Renewal Inspection. During this walkdown, the inspector identified that a nut on the 2D condensate booster pump flange did not meet the required minimum thread engagement criteria. The inspector questioned the representative on whether a condition report should be initiated to document the thread engagement issue. The representative stated that he was unsure whether a condition report was needed but would review the need further.

The following morning the inspector received a copy of an engineering change request to evaluate the thread engagement adequacy. The inspector questioned the need for a condition report a second time. Representatives from the NRC License Renewal Inspection Team discussed the need for a condition report with licensee management during the daily debrief and during the inspection pre-exit meeting on November 17. During the daily debrief, the licensee stated that a condition report was not needed and that evaluating the thread engagement issue via the engineering change process was appropriate. When the inspectors questioned licensee personnel regarding the process to be used after discovering a condition contrary to procedural requirements, the licensee stated that they needed additional time to review the issue. Following the pre-exit meeting, engineering personnel initiated Condition Report 181539 to document the thread engagement issue. Engineering personnel also initiated Condition Report 181949 on the failure to initiate a condition report for the thread engagement issue in a timely manner.

During this inspection period, the resident inspectors noted differences in the licensee's corrective action program implementation. For example, the licensee wrote a condition report during the license renewal inspection when a condition report was not initiated in a timely manner. However, the licensee did not typically initiate condition reports of this nature for issues identified during routine inspections conducted by the resident inspectors. The resident inspectors discussed this with the licensee and were informed that a condition report needed to be written for any corrective action program implementation issues regardless of the individual or group performing the inspection. The licensee stated that corrective action program implementation issues were an ongoing issue at the station. The licensee planned to place additional focus on this area during future condition report reviews.

### .3 Review of Condition Reports Regarding Equipment Status Tags

#### a. Inspection Scope

On September 29, 2003, operations personnel initiated Condition Report 178270 due to the inability to depressurize the 1B reactor water cleanup filter demineralizer using the instructions contained in QCOP 1200-05, "Reactor Water Cleanup Filter Demineralizer Manual Backwash and Precoat." The inspectors interviewed operations personnel to determine the sequence of events which led to the inability to depressurize the filter demineralizer and the actions taken to accomplish the depressurization.

#### b. Observations

Typically, operations personnel manipulated equipment using an approved procedure. When an approved procedure did not exist, operations personnel controlled minor equipment manipulations using the equipment status tag program. As stated above, operations personnel began backwashing and precoating a reactor water cleanup filter demineralizer using QCOP 1200-05. Step F.6 of QCOP 1200-05 required operations personnel to perform several valve manipulations to isolate and depressurize the filter demineralizer. The operators attempted to perform the valve manipulations but were unable to depressurize the filter demineralizer due to gross leakage through the demineralizer isolation valves. The operator in the field contacted a shift supervisor for



additional assistance. The operator and the shift supervisor identified and used an alternate valve lineup to depressurize the demineralizer. While interviewing the operator, the inspectors learned that the alternate lineup was controlled using the equipment status tag process.

On September 30 operations personnel initiated Condition Report 178435 due to the inability to open 1A reactor water cleanup filter demineralizer manual drain valve while performing backwash and precoat activities. The condition report initiator identified that a similar issue occurred in June 2003 and was resolved by using the equipment status tag program. The initiator stated that a procedure change should be initiated since the use of equipment status tags had not resolved the issues with the degraded reactor water cleanup valves. A subsequent procedure change was initiated after processing Condition Report 178435. However, individuals in the operations department did not recognize this as a second example of inappropriate use of the equipment status tag process.

Step 4.1.7 of HU-AA-104-101, "Procedure Use and Adherence," required personnel to stop when a procedure could not be performed as written and revise the procedure prior to continuing the work activity. In addition, OP-AA-108-102, "Equipment Status Tags," stated that equipment status tags were not to be used to provide operational instruction in lieu of an approved procedure. Based upon this information, the inspectors questioned operations personnel to determine why QCOP 1200-05 was not revised after determining that the procedure could not be performed as written due to the leaking isolation valves.

Initially, the inspectors were told that the alternate lineup used to depressurize the filter demineralizer was considered a minor equipment manipulation that could be controlled using either the equipment status tag process or the procedure change process. The inspectors disagreed with the licensee's position. Specifically, the activities required to depressurize the filter demineralizer were clearly delineated in an approved procedure. Because of this, operations personnel were prohibited from controlling the alternate valve lineup via the equipment status tag process. In fact, operations personnel were required to initiate a procedure change as directed by HU-AA-104-101 after identifying that QCOP 1200-05 could not be performed as written.

After additional review and discussions with the inspectors, operations department management initiated Condition Report 185188 to document the inappropriate use of the equipment status tag program during filter demineralizer backwash and precoat activities in lieu of processing a procedure revision. Corrective actions included briefing operations personnel on this issue, revising QCOP 1200-05, and reviewing the equipment status tag logs to ensure that no additional examples of inappropriate equipment status tag use existed.

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

- .1 (Closed) Unresolved Item 05000265/2003003-05: Failure of Anticipated Transient Without Scram Reactor Recirculation Pump Trip Breaker to Open as Designed During Plant Shutdown. On July 12, 2002, during the performance of QCOP 0202-34, "Unit 2 Reactor Recirculation System Shutdown," the 2A reactor recirculation pump motor

generator exciter field breaker failed to open. Maintenance personnel removed the breaker from its cubicle and transferred the breaker to the vendor for further analysis. The actual cause of the breaker failure was unable to be determined. The inspectors reviewed the licensee's breaker maintenance procedures, the breaker's equipment history, and the vendor manual to determine if a maintenance department performance deficiency caused, or contributed to, the breaker failure. This information was also reviewed by a breaker expert in the Office of Nuclear Reactor Regulation. The inspectors were unable to identify a performance deficiency which led to the failure. As a result, the inspectors were unable to assess the risk significance of this equipment failure using the Significance Determination Process. This item was not subject to NRC enforcement action due to the lack of an identifiable performance deficiency.

- .2 (Closed) Licensee Event Report 05000265/2003003: Low Pressure Coolant Injection Differential Pressure Instrument Inoperable Due to Misposition of Instrument Valve. On June 20, 2003, a low pressure coolant injection differential pressure instrument isolation valve was found isolated, rendering the instrument inoperable. A work history review identified that the valve was last manipulated on March 24, 2003, during a periodic surveillance. The inspectors reviewed the root cause report and other associated documents. The inspectors determined that human performance deficiencies contributed to the mispositioned valve. However, the three additional differential pressure switches that provide the one-out-of-two-taken-twice logic to direct injection of the low pressure coolant injection system to the intact reactor recirculation pipe during a loss of coolant event were in the proper position and operable. Therefore, the inspectors determined that the low pressure coolant injection differential pressure logic was available and would have functioned as designed. As a result, the item was considered minor and was not subject to NRC enforcement action.

#### 4OA4 Cross-Cutting Aspects of Findings

A finding described in Section 1R06 of this report had, as its primary cause, a human performance deficiency, in that, control room and radwaste operators were presented with multiple opportunities to identify that a residual heat removal relief valve had lifted and was discharging water into the reactor building floor drain sump prior to the sump overflowing. This finding also impacted the problem identification and resolution area as the licensee did not identify that operations personnel should have identified this event earlier as part of the initial review of the relief valve actuation.

#### 4OA6 Meetings

##### .1 Exit Meeting

The inspectors presented the inspection results to Mr. T. Tulon and other members of licensee management at the conclusion of the inspection on January 6, 2004. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Some of the information regarding the Unit 1 steam dryer were considered proprietary. While this information was reviewed by the NRC inspectors, the information was not discussed in detail in this report.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Biennial Licensed Operator Requalification Program Inspection with Mr. T. Tulon on October 31, 2003.
- Subsequent interim exit meeting via telephone with Mr. D. Snook to acknowledge the overall results of the 2003 NRC licensed operator requalification annual operating tests and written examinations on November 21, 2003.
- Maintenance Effectiveness Periodic Evaluation with Mr. B. Swenson on December 5, 2003.
- Biennial Heat Sink Inspection with T. Tulon on December 12, 2003.
- Radiological environmental monitoring program, radiological monitoring instrumentation program, aspects of the radiological access control program, ALARA planning and controls program, radioactive material processing and transportation program, and radioactive effluents program with Mr. T. Tulon, on October 3 and November 25, 2003.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

T. Tulon, Site Vice President  
B. Swenson, Plant Manager  
R. Armitage, Training Director  
D. Barker, Radiation Protection Manager  
J. Bartlett, Operations Training Manager  
W. Beck, Regulatory Assurance Manager  
G. Boerschig, Work Control Manager  
R. Gideon, Engineering Manager  
T. Hanley, Maintenance Manager  
D. Hieggelke, Nuclear Oversight Manager  
K. Leech, Security Manager  
K. Moser, Chemistry/Environ/Radwaste Manager  
M. Perito, Operations Manager  
T. Scott, Shift Operations Superintendent  
J. Wooldridge, Chemistry Supervisor

#### Nuclear Regulatory Commission

M. Ring, Chief, Reactor Projects Branch 1  
L. Rossbach, Project Manager

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened

05000265/2003013-01	NCV	Procedures for Placing Residual Heat Removal Pump in Shutdown Cooling not Appropriate to the Circumstances
05000254/2003013-02 05000265/2003013-02	NCV	Failure to Demonstrate Performance or Condition of Reactor Building Floor Drain Sump High Level Alarms were Effectively Controlled Through Performance of Preventive Maintenance
05000254/2003013-03	FIN	Failure to Ensure Terminal Connections Tightened Following Work Leads to Reactor Recirculation Runback
05000254/2003013-04	FIN	Failure of Steam Dryer Monitoring Plan to Detect Significant Dryer Degradation in the Early Stages to Preclude Failure Which Could Impact Safety-Related Equipment
05000254/2003013-05	URI	Unexpected Damage to the Electromatic Relief Valves due to Vibration

Closed

05000265/2003013-01	NCV	Procedures for Placing Residual Heat Removal Pump in Shutdown Cooling not Appropriate to the Circumstances
05000254/2003013-02 05000265/2003013-02	NCV	Failure to Demonstrate Performance or Condition of Reactor Building Floor Drain Sump High Level Alarms were Effectively Controlled Through Performance of Preventive Maintenance
05000254/2003013-03	FIN	Failure to Ensure Terminal Connections Tightened Following Work Leads to Reactor Recirculation Runback
05000254/2003013-04	FIN	Failure of Steam Dryer Monitoring Plan to Detect Significant Dryer Degradation in the Early Stages to Preclude Failure Which Could Impact Safety-Related Equipment
050000265/2003003-05	URI	Failure of Anticipated Transient Without Scram Recirculation Pump Trip Breaker to Open on Demand
05000265/2003003	LER	Low Pressure Coolant Injection Differential Pressure Instrument Inoperable due to Misposition of Instrument Valve

Discussed

None.

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 1R01 Adverse Weather

OP-AA-108-109; Seasonal Readiness; Revision 1

OP-AA-201-006; Control of Temporary Heat Sources; Revision 0

QCOP 0010-01; Winterizing Checklist; Revision 20

QCOP 0010-02; Required Cold Weather Routines; Revision 13

List of Work Orders Impacting Winter Readiness

Engineering Change 342478; Refeed Motor Control Center 16-8 from Bus 16, Cubicle 5D; dated November 6, 2003

Engineering Change 332727; Replace Unit 1 Reactor Building Heating Steam Coil and Condensate Return Piping; dated July 2, 2002

Design Change Package 9900227; Restore Heaters in Contaminated Condensate Storage Tank 0-3303-A and 0-3303-B; dated November 22, 1999

Condition Report 177009; Apparent Cause Evaluation for Maintenance Rule Functional Failure 140800 - Contaminated Condensate Storage Tank Heater Trip; dated September 23, 2003

Condition Report 172034; Maintenance Rule Functional Failure Classification for Condition Report 139596 Motor Control Center 16-7/16-8; dated August 18, 2003

Condition Report 139596; Feeder Breakers for Motor Control Centers 16-7, 16-8 and 17-5 Found Tripped; dated January 23, 2003

Condition Report 127689; Nuclear Oversight Identified Station Blackout Diesel Generator Glycol Systems Sampling/Monitoring Issues; dated October 16, 2002

Condition Report 127842; Nuclear Oversight Identified Need to Inspect Ventilation Duct for Foreign Material; dated October 17, 2002

Condition Report 129982; Failure to Fix Known Problem; dated November 1, 2002

Condition Report 142224; Reactor Vent Heating Coil Draining Issues; dated January 31, 2003

Condition Report 146496; Nuclear Oversight Identified Untimely Corrective Actions; dated February 27, 2003

Apparent Cause Evaluation Report for Condition Report 143088; Contaminated Condensate Storage Tank B Heaters De-Energized due to Inadequate Technical Review; dated March 27, 2003

Apparent Cause Evaluation Report for Condition Report 172034; Maintenance Rule Functional Failure for Loss of Motor Control Centers 16-7/16-8; dated September 22, 2003

Apparent Cause Evaluation Report for Condition Report 177009; Motor Control Center 15-3, Cubicle A1 Tripped; dated October 23, 2003

#### 1R04 Equipment Alignment

QCOP 1000-04; Residual Heat Removal Service Water System Operation; Revision 14

QOM 2-1000-05; Unit 2 Residual Heat Removal Service Water Valve Check List; Revision 11

QOM 1-1000-07; Residual Heat Removal and Residual Heat Removal Service Water System Fuse and Breaker Checklist; Revision 3

QOM 2-1000-07; Residual Heat Removal Fuse Checklist; Revision 4

QOM 1-1300-02; Unit 1 Reactor Core Isolation Cooling System Valve Checklist (RCIC Room); Revision 4

QOM 1-1300-03; Unit 1 Reactor Core Isolation Cooling System Valve Checklist; Revision 7

QOM 1-1300-04; Reactor Core Isolation Cooling System Fuse and Breaker Checklist; Revision 4

#### 1R05 Fire Protection

Quad Cities Nuclear Power Station Units 1 and 2 Pre-Fire Plans

Quad Cities Nuclear Power Station Units 1 and 2 Fire Hazards Analysis

#### 1R06 Flood Protection

Control Room and Radwaste Operator Logs; dated April 16-17, 2003

Reactor Building Floor Drain Sump Pump Run Times dated April 16-17, 2003

QCOP 1000-05, Shutdown Cooling Operation; Revision 32

QOA 900-4 D-18; Annunciator Response Procedure for Reactor Building Floor Drain Sump B High Level; Revision 3

Condition Report 154400; Sump Overflow due to Leaking Relief Valve; dated April 17, 2003

Equipment Apparent Cause Evaluation for Condition Report 154400; dated June 30, 2003

Condition Report 149897; Floor Drain Backed Up During 1A Core Spray Minimum Flow Line Draining; dated March 19, 2003

Condition Report 150214; Unit 1 Reactor Building Floor Drain Sumps Inoperable due to Broken Float Mechanism; dated March 21, 2003

Work Order 558126; Inspect/Tighten Float Rod on 2B Reactor Building Floor Drain Sump Pump; dated June 16, 2003

Non-Licensed Operator Rounds Sheets

Various Piping and Instrumentation Drawings

QCTP 0130-11; Internal Flood Protection Program; Revision 4

QCTS 0810-10; Reactor Building Internal Flood Barrier Surveillance; Revision 3

Condition Report 175524; NRC Concern on Response to Reactor Building Flooding Issue; dated September 10, 2003

Apparent Cause for Condition Report 175524; Timeliness of Operations Identification of Increased Process Flows in Radwaste; dated October 20, 2003

OP-AA-103-102; Watchstanding Practices; Revision 2

OP-AA-102-102; General Area Checks and Operator Field Rounds; Revision 2

QCAN 901(2)-3 H-6; Residual Heat Removal Pump D High Seal Leakage; Revision 1

#### 1R07 Heat Sink

Calculation VT-16; Residual Heat Removal Service Water and Diesel Generator Cooling Water Pump Room Cooler Performance Evaluation; Revision 18

Drawing M-325; Restriction Orifice Schedule; Revision A

Drawing M-37; Diagram of Residual Heat Removal Service Water Piping; Revision AW



Drawing Northwest Copper Works Inc D-20028; Residual Heat Removal Heat Exchanger Floating Head; Revision 6

Drawing Southwest Engineering Company M-82204; Residual Heat Removal Heat Exchanger General Arrangement Sectional Assembly; Revision 0

Drawing Southwest Engineering Company M-81435; Shell and Shell Cover Detail; Revision 2

Drawing Southwest Engineering Company M-81437; Tube Bundle Assembly; Revision 3

Drawing Aerofin Corporation SK-5002; Revision A

Drawing Buffalo Forge Company 7C-6322, Revision A

GE-NE-A22-00103-08-01; Dresden and Quad Cities Extended Power Uprate, Task TO400, Containment System Response; December 2000

Generic Letter 89-13 Implementation Program, Quad Cities Station; dated September 29, 2003

Heat Exchanger Inspection Report, 1A Service Water Pump Cubical Cooler; dated May 13, 2002

Heat Exchanger Inspection Report, 1A Service Water Pump Cubical Cooler; dated April 24, 1998

Letter to Commonwealth Edison Company from B. Spatz Goodwin Pumps; dated May 2, 2000

Letter to NRC; Response to Generic Letter 89-13; dated January 29, 1990

NDIT QDC-98-230: Transmittal of Revised Residual Heat Removal Heat Exchanger Data Sheet Based Upon Revised Data Sheet; dated August 20, 1998

Procedure QCMPM 4400-11; Residual Heat Removal Service Water Intake Bay Inspection; Revision 5

Procedure QCOS 5750-09; Emergency Core Cooling System Room and Diesel Generator Cooling Water Pump Cubicle Cooler Monthly Surveillance; Revision 5

Procedure QCOS 1000-04; Residual Heat Removal Service Water Pump Operability Test; Revision 37

Completed Procedure QCMPM 4400-11; dated July 2, 2003

Completed Procedure QCMPM 4400-11; dated January 16, 2003

Completed Procedure QCMPM 4400-11; dated June 5, 2002

Work Order 0033314601; 1A Residual Heat Removal Heat Exchanger Thermal Performance; dated January 13, 2003

Work Order 98007046601; 1A Residual Heat Removal Heat Exchanger Thermal Performance; dated December 10, 1998

Work Order 00369819; 1A Residual Heat Removal Heat Exchanger Leak Into Service Water; dated July 24, 2002

Work Order 00370993; Boroscope Inspection 1A Residual Heat Removal Heat Exchanger; dated October 26, 2001

Work Order 99240705; Simulate Response to Loss of Lock and Dam 14; dated December 3, 2003

Work Request Q89494; 1A Residual Heat Removal Heat Exchanger Leak; dated March 29, 1991

Action Request 00126431; 1A Residual Heat Removal Heat Exchanger Leak; dated October 8, 2003

Action Request 00082810; Leak on 1A Residual Heat Removal Heat Exchanger; dated December 5, 2002

Action Request 00089850; 1B Residual Heat Removal Heat Exchanger Leak; dated January 9, 2002

Action Request 00093012; Inconsistencies in Updated Final Safety Analysis Report; dated January 28, 2002

Action Request 00093336; Operability Evaluation for 1A Residual Heat Removal Heat Exchanger; dated January 31, 2002

Action Request 00098562; High Traveling Screen D/P; dated March 10, 2002

Action Request 00098960; 1A Residual Heat Removal Heat Exchanger Drain Bellows; dated November 12, 2001

Action Request 00100516; Updated Final Safety Analysis Report Change Needed; dated March 22, 2002

Action Request 00108530; Leakage on 2B Residual Heat Removal Heat Exchanger; dated May 17, 2002

Action Request 00109578; Possible Tube Leak 2A Residual Heat Removal Heat Exchanger; dated May 26, 2002

Action Request 00110756; Residual Heat Removal Service Water Intake Bay Inspection; dated January 5, 2002

Action Request 00116112; Leak on Unit 1 Residual Heat Removal Heat Exchanger; dated July 17, 2002

Action Request 00126984; Service Water Radiation Monitor Spike; dated October 11, 2002

Action Request 00129737; 2A Residual Heat Removal Heat Exchanger Leak; dated October 30, 2002

Action Request 00189928; Additional Corrective Actions Prudent for Condition Report 110756; dated December 10, 2003

Action Request 00190069; 1A Residual Heat Removal Heat Exchanger Drain Sleeve Not Repaired per Code; dated December 10, 2003

Action Request 00190175; Residual Heat Removal Service Water Pump Cubicle Cooler Tube Plugging Limit; dated December 11, 2003

Action Request 00190174; QCAO 0010-14 Lock and Dam Failure; dated December 11, 2003

Condition Report Q2000-01481; Silt, Zebra Mussels, and Partially Plugged Screens; dated November 11, 2000

Condition Report Q2001-03159; 1A Residual Heat Removal Heat Exchanger Leaking; dated October 11, 2001

Condition Report Q2001-02012; Loss of Corrosion Coupon; dated June 26, 2001

Condition Report Q2001-02273; Low Water Levels; dated July 19, 2001

Condition Report Q2001-02311; High Debris Volume; dated July 23, 2001

Condition Report Q2001-03090; Updated Final Safety Analysis Report Revision; dated October 4, 2001

Condition Report Q2001-00031; 1A Residual Heat Removal Heat Exchanger Leaking; dated October 11, 2001

Condition Report 110756; 10 Inches of Silting; dated June 5, 2002

#### 1R11 Licensed Operator Requalification

##### 2002 Annual Operating Examination Job Performance Measurements:

LP-003-I-F; Locally Start-Up Diesel Generator With Failure of Vent Fan To Start; Revision 12; dated July 9, 2002

LP-040-I; Defeating Reactor Core Isolation Cooling Steam Line Isolation Signal; Revision 5; dated July 21, 2002

LP-053-I; Transfer the Electrohydraulic Control Pressure Regulators; Revision 2; dated April 19 2001

LP-058-I; QCARP 0050-01 Ten Minute Actions for Alarm Response; Revision 2; dated July 2, 2002

LP-089-I; Rack-Out a 480V Air Circuit Breaker That Does Not Indicate Discharged; Revision 1, dated July 10, 2002

LS-020-I; Shutdown the Reactor Core Isolation Cooling System; Revision 9; dated July 8, 2002

LS-025-I; Change Over Control Rod Drive Pumps; Revision 9; dated July 6, 2002

LS-042-I-F; Perform the Standby Gas Treatment Monthly Operability Test With Failure of the Heater to Turn Off After Shutdown; Revision 7; dated September 14, 2001

LS-044-I; Recover From a High Pressure Coolant Injection Isolation; Revision 3; dated July 8, 2002

LP-002-II; Locally Start-up the ½ A(B) Fire Diesel; Revision 12; dated March 11, 2002

2002 Annual Operating Examination Scenarios:

00-28; Torus Narrow Range Instrument Failure/loss of Coolant Accident Inside Containment/Anticipated Transient Without Scram; Revision 10; dated September 2002

00-29; Automatic Depressurization System Logic Power Failure/Loss of HP Feedwater/Anticipated Transient Without Scram/Loss of All Automatic Depressurization System Valves/Automatic Depressurization System Valve Seat Failure/Containment Venting Revision 10; dated June 2002

00-07; Control Rod Drive Pump Trip/Rod Drift/Loss of Condenser Vacuum/Anticipated Transient Without Scram; Revision 16; October 2002

00-34; Fuel Pool Rad Monitor Failure/Inadvertent High Pressure Coolant Injection/Steam Leak Outside Primary Containment/Failure of Group 1 and RB Vent Isolations; Revision 6; October 2002

2003 Annual Operating Examination JPMs:

LP-001-I; Locally Start-up the High Pressure Coolant Injection System to Control Reactor Pressure Vessel Level; Revision 19; dated September 4, 2003

LP-021-I; Locally Operate the Reactor Core Isolation Cooling System to Inject Water Into the Vessel; Revision 4, dated September 9, 2003

LP-025-I; Bypass the Reactor Water Cleanup Isolation Signals; Revision 16; dated August 25, 2003

LP-058-I; QCARP 0050-01(02) Ten Minute Actions for Alarm Response; Revision 3; dated August 20, 2003

LP-062-I; SSMP Suction Swap per QCARP; Revision 1; dated September 9, 2003

LS-002-I; Start-up the Standby Gas Treatment System; Revision 12; dated September 5, 2003

LS-003-I-F; Perform the Monthly Core Spray Pump Operability Test With Failure of Minimum Flow Valve; Revision 7; dated September 9, 2003

LS-005-I; Return Locked Feedwater Regulator to Operation; Revision 10; dated September 9, 2003

LS-008-I-F; Initiate Standby Liquid Control With Failure to Inject; Revision 7; dated September 3, 2003

LS-027-I; Transfer the Reactor Mode Switch to Run; Revision 9; dated September 21, 2003

LS-034-I; Perform the Weekly Turbine Generator Tests; Revision 12; dated September 28, 2003

LP-001-II; Inject Water Into the Reactor Pressure Vessel Using the Condensate System Crosstie; Revision 1; dated August 24, 2003

LP-003-II; Provide Alternate Ventilation to the Control Room and Aux Electric Room; Revision 11; dated August 27, 2003

LP-008-II; Locally Cycle a Residual Heat Removal/Residual Heat Removal-Service Water Pump Breaker for Appendix R Surveillance; Revision 1; dated September 4, 2003

LS-007-II; Start-up Torus Cooling; Revision 10; dated September 5, 2003

2003 Annual Operating Examination Scenarios:

00-07-B; Control Rod Drive Pump Trip/Rod Drift/Loss of Condenser Vacuum/Anticipated Transient Without Scram; Revision 17; dated September 2003

00-31-B; SW Rad Monitor Failure/Recirc Pump Speed Signal Failure/Fuel Failure/Turbine Building Steam Leak/Quad Cities Emergency Procedure 400 Blowdown; Revision 11; dated September 2003

00-21-C; ADS Logic Power Failure/Loss of High Pressure Feedwater/Anticipated Transient Without Scram/Loss of All Automatic Depressurization System Valves; Revision 11; dated September 2003

00-32-C; Main Steam Line Flow Instrument Failure/Instrument Bus Transfer/Feedwater Leak in the Drywell/Unisolable Leak Outside Containment/Reactor Pressure Vessel Blowdown Area Water Levels; Revision 10; dated September 2003

00-25-D; Condensate Pump Trip/Loss Of Bus 14/Diesel Generator Failure/Station Blackout/Main Steam Line Break in DW; Revision 13; dated September 2003

00-12-D; Reactor Building Supply Fan Trip/Inadvertent High Pressure Coolant Injection Initiation/Steam Leak/Main Steam Isolation Valve Closure/AWS; Revision 13; dated August 2003

2003 Annual Written Examinations:

TT11(1500) Crew B Reactor Operator Static 02; Validation Load QC 03.02; Revision 3; dated September 11, 2003

TT07(1500) Crew C Reactor Operator Static 14; Validation Load QC 03.02; Revision 1; dated September 8, 2003

TT09(1500) Crew D Reactor Operator Static 08; Validation Load QC 03.02; Revision 1; dated September 11, 2003

TT23(1500) Crew B Reactor Operator Written 1; dated October 30, 2003

TT13(1500) Crew C Reactor Operator Written 1; dated October 23, 2003

TT20(1500) Crew D Reactor Operator Written 1; dated October 16, 2003

TT12(1500) Crew B Senior Reactor Operator Static 02; Validation Load QC 03.02; Revision 3; September 11, 2003

TT08(1500) Crew C Senior Reactor Operator Static 14; Validation Load QC 03.02; Revision 1; dated September 8, 2003

TT10(1500) Crew D Senior Reactor Operator Static 08; Validation Load QC 03.02; Revision 1; dated September 11, 2003

TT24(1500) Crew B Senior Reactor Operator Written 1; dated October 30, 2003

TT19(1500) Crew C Senior Reactor Operator Written 1; dated October 23, 2003

TT21(1500) Crew D Senior Reactor Operator Written 1; dated October 16, 2003

2004-2007 Quad Cities Simulator Guideline Malfunction Testing Schedule; Revision 0

ACE 175524-01; Apparent Cause Evaluation Timeliness of Operations Identification of Increased Process Flows in Radwaste; Event Date April 17, 2003

Classroom Sample Plan for Training Years 2002/2003

Non-Complete Status Open Simulator Work Request Report (42 Open Simulator Work Requests, various dates)

OP-AA-105-102; NRC Active License Maintenance (for 12 operators); Revision 3

Q1R18, Cycle 18 Core Model Testing, Year 2003 (Simulator)

IT-AB-3001; BWR Steady State Conditions at Power

IT-AB-3002; BWR Critical Condition at 220 degree F

IT-AB-3003; BWR Void Coefficient of Reactivity

IT-AB-3004; BWR Moderator Temperature Coefficient of Reactivity

IT-AB-3005; BWR Doppler Coefficient of Reactivity

IT-AB-3006; BWR Control Blade Worth

IT-AB-3007; BWR Xenon Worth

Quad Cities Comprehensive Self-Assessment (LORT) Report  
(August 5 - August 8, 2002)

Quad Cities Focused Area Self-Assessment (LORT) Report  
(March 14 - April 30, 2003)

Quad Cities Licensed Operator Requalification Training Self-Assessment Report  
(September 16, 2003)

Quad Cities Licensed Operator Requalification Training Self-Assessment Report  
(August 12 - 14, 2003)

Quad Cities Operations Functional Area Audit Report NOS Audit NOSA-QDC-03-07  
(Alarm Response 175511) September 29 - October 10, 2003

Simulator Work Requests:

SWR 3759; Narrow Range Yarway Spuratic Operation; dated July 12, 2002

SWR 4298; 1-263-100A Narrow Range Level Meter; dated December 10, 2002

SWR 3483; Rod Worth Minimizer Response; dated April 24, 2002

SWR 4405; Thor Model Aborted While Testing MF RR10B Recirc Loop Suction Pipe  
Rupture; dated January 15, 2003

SWR 4548; Reactor Recirculation Pump Logic; dated February 27, 2003

SWR 4589; CERT Testing Low Pressure Coolant Injection Loop Select; dated March 11, 2003

SWR 4998; Core Model Upgrade; dated June 4, 2003

Simulator Work Request Report: List of Completed or Pending Completion Simulator Work Requests (October 24, 2002 to October 24, 2003)

TQ-AA-106; Licensed Operator Requalification Training Program Description; Revision 2

TQ-AA-106-0113; Simulator Demonstration Examination Individual Competency Evaluation (2002 and 2003 annual examinations); Revision 0

TQ-AA-106-0114; Simulator Demonstration Examination Crew Competency Evaluation Forms (for evaluated crew); Revision 0

TQ-AA-106-0115; Simulator Demonstration Examination Shift Manager Competency Evaluation (2002 and 2003 annual examinations); Revision 0

TQ-AA-106-0116; Job Performance Measurement Evaluation Summary (2002 and 2003 annual examinations); Revision 0

TQ-AA-106-0117; Job Performance Measurement Examination Work Practices Evaluation (2002 and 2003 annual examinations); Revision 0

TQ-AA-106-0118; Licensed Operator Requalification Training Examination Bank Question Submittal/Validation/Review Form; Revision 0

TQ-AA-106-0304; Licensed Operator Requalification Training Examination Job Aid; Revision 1

TQ-AA-106-0305; Licensed Operator Requalification Training Examination Job Aid; Revision 0

TQ-AA-108-0101; STA Simulator Evaluation (2002 and 2003 annual examinations); Revision 0

TQ-AA-201; Examination Security and Administration; Revision 4

TQ-AA-210-4101; Remedial Training Notification and Action on Failure (2002 and 2003 annual examinations); Revision 0

TQ-AA-210-4102; Performance Review Committee Data Sheet (2002 and 2003 annual examinations); Revision 0

TQ-AA-301; Simulator Configuration Management; Revision 3



TQ-AA-301-0301; Simulator Work Request Prioritization Maintenance, Modification, and Enhancements; Revision 1

TQ-AA-302; Simulator Testing and Documentation; Revision 3

TQ-AA-303; Controlling Simulator Core Updates and Thermal-Hydraulic Model Updates; Revision 1

TQ-AA-302-0104; Simulator Testing Discrepancy Record; Revision 0

Simulator Test Performance Documents:

TR-1; Manual Reactor Scram from 100%; dated January 13, 2003

TR-2; Loss of All Feedwater; dated January 13, 2003

TR-3; Simultaneous Closure of All Main Steam Isolation Valve Isolation; dated January 13, 2003

TR-4; Simultaneous Trip of All Reactor Recirculation Pumps; dated January 13, 2003

TR-5; Trip of Single Reactor Recirculation Pump; dated January 13, 2003

TR-6; Main Turbine Trip from 100%; dated January 13, 2003

TR-7; Maximum Rate Power Ramp; dated January 13, 2003

TR-8; Loss of Coolant Accident with Loss of Offsite Power; dated January 13, 2003

TR-9; Maximum Size Unisolable Main Steam Line Rupture; dated January 13, 2003

One Hour Stability Test at 100% Power; dated January 8, 2003

25% Power Steady State Performance Test; dated March 6, 2003

RR-10; Recirculation Loop Suction Pipe Rupture; dated January 13, 2003

RR-10; Recirculation Loop Suction Pipe Rupture; dated March 6, 1999

RR-11; Recirculation Loop Discharge Pipe Rupture; dated January 14, 2003

RR-12; Reference Leg Pipe Rupture @ Reactor Pressure Vessel Nozzle; dated January 14, 2003

RR-15; Feedwater Level Control Level Transmitter Failure; dated January 22, 2003

Core Performance Simulator Test, Manual Heat Balance; dated October 21, 2003

Core Performance Simulator Test, Shutdown Margin Determination; dated October 21, 2003

QCTS 0920-1; Shutdown Margin Determination; Revision 8

NF-QC-770-1000; Manual Heat Balance; Revision 0

1R12 Maintenance Effectiveness

Maintenance Rule (a)(1) Monitoring Goals for Function Z0203; dated June 9, 2003

Maintenance Rule (a)(1) Action Plan for Function Z0203; dated June 9, 2003

Root Cause for Condition Report 154275; Quad Cities Unit 2 Manual Scram due to Inadvertent 3B Power Operated Relief Valve Opening and Elevated Torus Temperatures; dated June 4, 2003

Main Steam System Health Report; dated June 9 and October 13, 2003

Apparent Cause Report for Condition Report 97454; Failure of the 2-0203-2CC Accumulator Check Valve on March 1, 2002, due to Improper Maintenance on February 23, 2002; dated July 29, 2002

Condition Report 101650; Inspection Results from Drywell Troubleshooting of the 3E Power Operated Relief Valve; dated March 30, 2002

Apparent Cause Report for Condition Report 101650; Unit 2 Power Operated Relief Valve 2-0203-3E Electrical Failure due to Crack in Barrier Weld; dated April 4, 2003

Condition Report 154275; Inadvertent Opening of the 2B Power Operated Relief Valve; dated April 16, 2003

Condition Report 154789; 3B and 3E Power Operated Relief Valve Tailpipe Temperatures Greater than 175 Degrees; dated April 21, 2003

Apparent Cause Report for Condition Report 154789; Unit 2 Power Operated Relief Valves 3B and 3E have Elevated Tailpipe Temperatures, Resulting in Unit Shutdown; dated May 21, 2003

Maintenance Rule Performance Criteria for Function Z0203

Maintenance Rule Evaluation History for Function Z0203; dated January through September 2003

Condition Report 154400; Sump Overflow due to Leaking Relief Valve; dated April 17, 2003

Equipment Apparent Cause Evaluation for Condition Report 154400; dated June 30, 2003

Condition Report 149897; Floor Drain Backed Up During 1A Core Spray Minimum Flow Line Draining; dated March 19, 2003

Condition Report 150214; Unit 1 Reactor Building Floor Drain Sumps Inoperable due to Broken Float Mechanism; dated March 21, 2003

Work Order 558126; Inspect/Tighten Float Rod on 2B Reactor Building Floor Drain Sump Pump; dated June 16, 2003

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QCTS 0810-10; Reactor Building Internal Flood Barrier Surveillance; Revision 3

Condition Report 175524; NRC Concern on Response to Reactor Building Flooding Issue; dated September 10, 2003

Apparent Cause for Condition Report 175524; Timeliness of Operations Identification of Increased Process Flows in Radwaste; dated October 20, 2003

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Maintenance Rule Evaluation History for Function Z0012; dated January through September 2003

Expert Panel Meeting Minutes Regarding Change in Functional Failure Definition for Function Z0012-01; dated June 2003

10 CFR 50.65 Assessment Quad Cities Station; May 2000 - May 2002; dated July 15, 2002

Maintenance Rule (a)(3) Assessment Quad Cities Station; April 1998 - April 2000; dated July 31, 2000

Maintenance Rule System Status; High Safety Significant Systems and Low Safety Significant Systems; dated November 24, 2003

System Health Overview Report; High Pressure Core Injection; dated October 2003

System Health Overview Report; Residual Heat Removal including Low Pressure Core Injection and Residual Heat Removal Service Water; dated September 2003

ER-AA-310; Implementation of the Maintenance Rule; Revision 2

ER-AA-310-1001; Maintenance Rule - Scoping; Revision 1

ER-AA-310-1002; Maintenance Rule - SSC Risk Significance Determination; Revision 1

ER-AA-310-1003; Maintenance Rule - Performance Criteria Selection; Revision 2

ER-AA-310-1005; Maintenance Rule - Dispositioning Between (a)(1) and (a)(2);  
Revision 1

ER-AA-310-1006; Maintenance Rule - Expert Panel Roles and Responsibilities;  
Revision 1

ER-AA-310-1007; Maintenance Rule - Periodic (a)(3) Assessment; Revision 2

ER-AA-310-1004; Maintenance Rule - Performance Monitoring; Revision 1

AT-117710-02; Establish Actions to Ensure more Timely Reviews of Plant Level  
Performance Criteria Events and CR Classifications by the Expert Panel

AT-117710-03; Determine Actions needed to Periodically Review Maintenance Rule  
Program Fundamentals

AT-117710-04; Determine Actions to Periodically Review Maintenance Rule Program  
Fundamentals

AT-117710-06; Review the Updated PRA for Changes to Maintenance Rule Performance  
Criteria

AT-117710-08; Evaluate the Areas For Improvement

System Description; High Pressure Core Injection; Revision 0

System Description; Residual Heat Removal; Revision 0

Expert Panel Meeting Minutes; dated January 24, 2002

Expert Panel Meeting Minutes; dated February 7, 2002

Expert Panel Meeting Minutes; dated February 28, 2002

Expert Panel Meeting Minutes; dated April 18, 2002

Expert Panel Meeting Minutes; dated April 25, 2002

Expert Panel Meeting Minutes; dated May 9, 2002

Expert Panel Meeting Minutes; dated May 23, 2002

Expert Panel Meeting Minutes; dated June 25, 2002

Expert Panel Meeting Minutes; dated July 2, 2002

Expert Panel Meeting Minutes; dated July 10, 2002

Expert Panel Meeting Minutes; dated July 30, 2002

Expert Panel Meeting Minutes; dated August 6, 2002

Expert Panel Meeting Minutes; dated September 12, 2002

Expert Panel Meeting Minutes; dated September 26, 2002

Expert Panel Meeting Minutes; dated October 10, 2002

Expert Panel Meeting Minutes; dated October 15, 2002

Expert Panel Meeting Minutes; dated October 25, 2002

Expert Panel Meeting Minutes; dated October 31, 2002

Expert Panel Meeting Minutes; dated December 12, 2002

Maintenance Rule (a)(1) Action Plan for High Pressure Coolant Injection; dated November 2003

Quad Cities Station Maintenance Rule Performance Criteria; 2003

Status of Maintenance Rule Systems; 2003

Maintenance Functional Failures from June 2000 to June 2002

Condition Report 0088262; 1B Torus Level Switch Failed to Reset during QCOS 2300-11; dated December 26, 2001

Condition Report 0089005; ½ Instrument Air Dryer, 0-4702, not Swapping Properly; dated December 20, 2001

Condition Report 0091880;SSDI: Reduced Seismic Criteria Used to Qualify Residual Heat Removal Service Water Piping; dated January 17, 2002

Condition Report 0102091; Main Steam Leak cause Load Reduction and Turbine Removal; dated April 2, 2002

Condition Report 0102045; River Inleakage into Condenser through Abandoned Vent Line; dated March 31, 2002

Condition Report Q2000-02942; URI, 1996 Design Issue Involved a Condition in which the HPCI Turbine Motor Speed Changer could Fail; dated July 28, 2000

Condition Report Q2000-02416; Design Vulnerability Identified on HPCI System; dated July 1, 2002

Condition Report Q2000-02574; U2 Reactor SCRAM on Generator Load Reject; dated July 18, 2000

Condition Report Q2000-03528; HPCI Relay 2-2330-116B, Contacts 7 and 8 Did Not Close w/Relay Energized; dated October 10, 2000

Condition Report Q2000-03661; Unit 1 HPCI 10-Year Overhaul Deferral and Nonconformance Issues; dated October 14, 2000

Condition Report Q2000-04088; 1B Recirculation Motor Generator; dated November 6, 2000

Condition Report Q2000-04142; 1B Recirculation Pump Trip; November 13, 2000

Condition Report Q2000-04137; 1B Recirculation Pump Trip; dated November 12, 2000

Condition Report Q2001-00944; U2 HPCI Failed to Meet Parameters; dated March 23, 2001

Condition Report Q2001-02441; Loss of U2 Main Power Transformer; dated August 2, 2001

Condition Report Q2001-02451; OCB 9-10 LBB SBF Relay Dropout Time ; dated August 2, 2001

Condition Report Q2001-02716; Unit 2 Main Condenser Tube Leak (Water Box Vent); dated August 29, 2001

Condition Report Q2001-02790; U-2 Reactor Water - Elevated Chlorides due to Apparent River Water Inleakage; dated August 31, 2001

Condition Report Q2001-03159; 1A Residual Heat Removal Heat Exchanger Leaking from Reactor Side into Service Water; dated October 11, 2001

### 1R13 Maintenance Risk Assessment and Emergent Work

Fragnet for Maintenance Performed on the Unit 1 High Pressure Coolant Injection System; dated October 16, 2003

Daily Work Schedule; dated October 20 through 23 and December 8 through 12, 2003

Work Week Safety Profile for Weeks Ending October 11, 18 and 25, and December 13, 2003

Condition Report 179699; 1A Reactor Recirculation System Runback; October 7, 2003

Condition Report 180839; ½ Emergency Diesel Generator Failed to Start; October 14, 2003

Operation's Daily Orders; dated October 6 through 10, October 13 through 17, and December 8 through 12, 2003

## 1R14 Non-Routine Evolutions

QCAN 901(2)-4 G-4; Recirculation Loop "A" Flow Limit; Revision 10

Condition Report 179699; 1A Recirculation Motor-Generator Runback; dated October 7, 2003

QCOP 0202-12; Reactor Recirculation System Motor-Generator Set Scoop Tube Lock-up and Local Manual Operation; Revision 22

QCOP 0700-10; Oscillation Power Range Monitoring Operation; Revision 4

QCOP 0600-02; Placing Main Feedwater Regulator On-line or Off-line; Revision 14

QCOA 0202-03; Reactor Recirculation System Failure, Flow Controller Fails Low; Revision 9

Unit 1 Control Room Operator Logs; dated October 7 through 9, 2003

Figure 0202-16; Recirculation Speed Control Network; Revision 0

Figure 3500-01; Feedwater Heating Flow Diagram; Revision 0

QCOA 0400-02; Core Instabilities; Revision 10

QCOP 0202-13; Reactor Recirculation System Flow Controller Operation; Revision 12

OP-AA-106-101-1001; Event Response Guidelines; Revision 3

OP-AA-101-111-1001; Operations Philosophy Handbook; Revision 1

OP-AA-101-111-1002; Operations Fundamentals; Revision 2

OP-AA-101-113; Monitoring Performance; Revision 0

OP-AA-102-103; Operator Work-Around Program; Revision 0

OP-AA-102-101; Unit Load Changes; Revision 2

OP-AA-103-104; Reactivity Management Controls; Revision 2

OP-QC-106-101-1001; Enhanced Event Response Guideline; Revision 0

QCGP 3-1; Reactor Power Operations; Revision 35

Summary of Digital Feedwater Control System Response; dated October 7, 2003

Sequence of Events Recorder Alarm Summary; dated October 7, 2003

QCOP 0600-02; Placing Main Feedwater Regulator On-Line or Off-Line; Revision 14

QCOS 0202-07; Jet Pump Flow Distribution Comparison; Revision 16

QCOA 3500-01; Feedwater Temperature Reduction with Main Turbine On Line;  
Revision 20

QCOP 0202-13; Reactor Recirculation Flow Control Line Determination; Revision 7

Condition Report 183669; Unit One Dryer Monitoring - Steam Flow Change; dated  
October 28, 2003

Steam Dryer Monitoring Plan Results; dated October 26 through November 3, 2003

Control Room Logs; dated October 26 through November 3, 2003

Condition Report 183669; Unit One Dryer Monitoring, Steam Flow Change; dated  
October 28, 2003

#### 1R15 Operability Evaluations

Code of Federal Regulations

Updated Final Safety Analysis Report

Condition Report 177249; Station Public Address System Issue; dated  
September 24, 2003

EP-MW-113-100; Assembly, Evacuation, and Accountability; Revision 0

EP-AA-112; Emergency Response Organization/Emergency Response Facility Activation  
and Operation; Revision 8

EP-AA-1006; Radiological Emergency Plan for Quad Cities Station; Attachment E

Operability Evaluation 168367-08; Unit 1 Steam Dryer Degradation; Revision 1

Condition Report 180661; Loss of High Pressure Coolant Injection Room Cooler  
Fan - Appendix K and Environmentally Qualified; October 13, 2003

Condition Report 174387; Impact Loss of HPCI Room Cooler Fan on Appendix K LOCA  
Analysis; September 4, 2003

Binder No. EQ-47Q; United Temperature Switch Type F7, Model 88B, Tab C; Revision 6

GE-NE-0000-5200-R0; Lost Parts Analysis for Quad Cities Generating Station Unit 1  
Steam Dryer Outer Hood (270 Degree Side); dated November 2003



## 1R16 Operator Workarounds

QCGP 3-1; Reactor Power Operations; Revision 35

Condition Report 161391; 1B Reactor Recirculation Motor Generator Set Voltage Regulator Volts/Hertz; June 1, 2003

QCGP-2-3; Reactor Scram; Revision 45

Condition Report 134389; Root Cause for 1B Reactor Recirculation Motor-Generator Voltage Regulator Output Instabilities Due to Inadequate Phase/Gain Margins in Original Vendor Design; Revision 9

OWA 03-013; 1B Recirculation Motor Generator Set Voltage Regulator Volts/Hertz Swing; July 29, 2003

Open Operator Work Arounds and Operator Challenges; dated October 13, 2003

## 1R19 Post Maintenance Testing

QCOS 5750-09; ECCS Room and DGCWP Cubicle Cooler Monthly Surveillance; Revision 25

Work Order 321087; Replace High Pressure Coolant Injection Room Cooler Tube Bundle; dated October 16, 2003

Calculation QDC-5700-M-0806; Emergency Core Cooling System Room Cooler Performance Calculation Under Design Basis and Degraded Conditions; Revision 1

Condition Report 180839; ½ Emergency Diesel Generator Failed to Start; dated October 14, 2003

Work Order 589313-03; Re-wire, Bench Test, and Install a New Speed Sensing Panel for Unit ½ Emergency Diesel Generator; dated October 14, 2003

Work Order 589313-01; Troubleshoot the Cause of the ½ Emergency Diesel Generator Failure to Start; dated October 14, 2003

Engineering Change 345199; Common Cause Evaluation due to ½ Emergency Diesel Generator Failure to Start; dated October 14, 2003

QCOS 6600-13; Shared Unit ½ Diesel Generator Outage Report; dated October 14, 2003

QCOS 6600-43; Unit ½ Diesel Generator Load Test; dated October 14 and October 17, 2003

QCEPM 0700-18; Calibration of Diesel Generator Time Delay Relays; Revision 16

QCOS 0203-03; Main Steam Relief Valves Operability Test; Revision 20

1R20 Refueling and Outage

Nuclear Regulatory Commission Inspection Report 07200037/2001002; dated February 21, 2001

Nuclear Regulatory Commission Inspection Report 05000237/2003002; 05000249/2003002; dated April 30, 2003

Quad Cities Nuclear Power Station, Units 1 and 2 - Issuance of Amendments RE: Heavy Loads Handling; dated November 4, 2002

Condition Report 141040; Reactor Building Main Hoist Components Do Not Meet Factor of Safety; dated January 24, 2003

NRC Bulletin 96-02; Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment; dated April 11, 1996

Commonwealth Edison Response to NRC Bulletin 96-02, "Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment;" dated May 13, 1996

Completion of Licensing Action for NRC Bulletin 96-02 for Quad Cities, Units 1 and 2; dated May 20, 1998

MA-AB-756-600; Reactor Disassembly; Revision 4

Condition Report 186058; Source Range Monitor 21 Declared Inoperable; dated November 13, 2003

Condition Report 186069; 3D Electromatic Relief Valve Flange Leak; dated November 12, 2003

Condition Report 186471; Reactor Steam Dryer Indication; dated November 12, 2003

Condition Report 186469; Main Steam Line Damaged Tie Back Supports; dated November 13, 2003

Condition Report 186518; Identified Damage on Unit 1 Reactor Pressure Vessel Surface Cladding; dated November 13, 2003

Condition Report 186700; 3B Electromatic Relief Valve Pilot Valve Leakoff Line Sheared; dated November 15, 2003

Condition Report 186698; Unit 1 Steam Dryer Tie Back #2 Damaged; dated November 15, 2003

Condition Report 186699; Unit 1 Steam Dryer Tie Back #1 Damaged; dated November 15, 2003

Condition Report 186070; Head Vent Valves Leaking Past Seats; dated November 12, 2003

Condition Report 186768; Unit 1B Reactor Recirculation Pump; dated November 15, 2003

Condition Report 187523; 1C Outboard Main Steam Isolation Valve Accumulator Leak at Pipe Union/Bent Line; dated November 20, 2003

Condition Report 188260; Indications of Foreign Material Migration on 1B Recirculation Pump; dated November 26, 2003

Condition Report 188333; Foreign Material Evaluation for Dryer Pieces; dated November 26, 2003

Condition Report 188050; Extent of Condition Walkdown Issues; dated November 24, 2003

Condition Report 188052; Walkdown Deficiency Items During Extent of Condition; dated November 24, 2003

Condition Report 188202; Documentation Results of Extent of Condition for Electromatic Relief Valve Vibrations; dated November 24, 2003

Q1F51 Key Systems Used for Shutdown Safety; issued daily during Unit 1 outage

ORAM Sentinel Outage Risk Assessment

QCGP 1-1; Normal Unit Startup; Revision 48

QCGP 2-1; Normal Unit Shutdown; Revision 39

QCGP 3-1; Reactor Power Operations; Revision 36

QCOS 1600-32; Drywell/Torus Closeout; Revision 10

Letter from R. John Diletto to Rick Swart; Failure Evaluation of the 3B Electromatic Relief Valve Pilot Vent Line; dated November 26, 2003

Report No. VT-001; Visual Examination Record for the Electromatic Relief Valves; dated November 15, 2003

Report No. VT-003; Visual Examination Record for the 3D Electromatic Relief Valve; dated November 25, 2003

Temporary Configuration Change Permit 335982; Extended Power Uprate Vibration Monitoring for Main Steam and Feedwater Piping; Revision 4

Quad Cities Unit 1 Vibration Monitoring Test Plan

Unit 2 Undervessel Pictures; dated January, March and April 1971

Q1F51 Reactor Recirculation Pump B Firefly Photos; dated November 26, 2003

Drawing 104R921; Assembly Reactor

Training Drawing 0250-01; Main Steam System; Revision 1

Piping and Instrumentation Drawing M-100; Main Steam Piping Plan and Sections; Revision N

Q1F51 Steam Dryer Foreign Material Inspection Plan; dated November 22, 2003

Letter from D. B. Drendel, General Electric to T. Wojcik, Exelon; Quad Cities 1 Divot in Reactor Pressure Vessel Cladding; dated November 18, 2003

Letter from D. B. Drendel, General Electric to B. Phares, Exelon; Quad Cities 1 Bent Steam Dryer Guide Rod Channels; dated November 21, 2003

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Training Drawing 0201-01; Reactor Vessel and Internals; Revision 0

Training Drawing 0202-01; Recirculation System; Revision 2

Drawing 1DW3; Unit 1 Drywell; Revision 8

Indication Notification Report Q1F51-03-01; Steam Dryer Outer Hood; Revision 1

Indication Notification Report Q1F51-03-03; Steam Dryer Tie Bar #2; Revision 0

Indication Notification Report Q1F51-03-04; Steam Dryer Tie Bar #1; Revision 0

Indication Notification Report Q1F51-03-05; Steam Dryer Supports and Struts; Revision 3

Indication Notification Report Q1F51-03-06; Steam Dryer Tie Bars #10 and 11; Revision 0

Indication Notification Report Q1F51-03-07; HFE Vertical Plate #1; Revision 0

Indication Notification Report Q1F51-03-08; Steam Dryer ID Vertical Weld V1 Bank F; Revision 1

Indication Notification Report Q1F51-03-09; Steam Dryer Skirt; Revision 1

Indication Notification Report Q1F51-03-10; Steam Dryer H-3 270 Degree Gouge; Revision 0

Indication Notification Report Q1F51-03-11; Bent Guide Rod Channels; Revision 0

Indication Notification Report Q1F51-03-12; Horizontal Weld R2; Revision 0

Indication Notification Report Q1F51-03-14; Dryer Drain Channel Weld DC-D-0 Degrees; Revision 0

Indication Notification Report Q1F51-03-14; Dryer Drain Channel Welds; Revision 1

Indication Notification Report Q1F51-03-14; Dryer Drain Channel and Skirt Indications; Revision 2

Indication Notification Report Q1F51-03-16; Vertical Seam Weld Vane Assembly to Plate; Revision 0

Condition Report 186979; Unit 1 1-0203-3B Electromatic Relief Valve Solenoid Actuator and Pilot Vent Line Pipe Failures due to Synergistic Effects of Cold Spring, Pipe Indentation, and Weld Voids; November 15, 2003

Condition Report 187787; 3C ERV Showing Excessive Wear; November 22, 2003

Condition Report 187789; 1-203-3E ERV Shows Excessive Wear; November 22, 2003

Condition Report 187788; 3D ERV Shows Excessive Wear; November 22, 2003

Condition Report 188202; Documentation Results of Extent of Condition for ERVs Vibrations; November 25, 2003

Condition Report 188204; Dresser ERV Torque Specifications Not Included in Procedures, Work Orders; November 25, 2003

1R22 Surveillance Testing

QCOS 6620-11; Station Blackout Diesel Generator 1(2) Semi-Annual Remote/Local/PLC Bypass Emergency Start Test; Revision 10

Licensed/Non-Licensed Operator Training Module LN-6620; Station Blackout System; Revision 9

Technical Specifications

Updated Final Safety Analysis Report

Condition Report 169480; While Performing QCIS 0200-38 Relay Contacts Exhibited Intermittent Resistances; dated July 29, 2003

Condition Report 179911; Condenser Low Vacuum Switch Relays Don't Reset Properly; dated October 8, 2003

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Work Order 417280; Perform Calibration on PI 1-1001-71A per QIP 0100-19; dated March 2, 2003

Work Order 551253; Perform Calibration on PI 1-1001-71A per QIP 0100-19; dated October 24, 2003

MA-AA-716-100; Maintenance Alteration Process; Revision 1

QIP 0100-19; Calibration of Inservice Testing Instruments Used by Operating Department in the Performance of Operating Department Surveillance Requirements; Revision 18

Instrument Calibration Data Sheet for PI 1-1001-71A

Condition Report 182811; Apparent Incorrect Pressure Indicator Calibrated; dated October 24, 2003

2OS1 Access Control and  
2OS2 ALARA Planning and Controls

10003680; U1 Steam Dryer Diving Activities

10003791; U1 Inboard MSIVs: X-Ray for FME

RP-QC-350-1001; Response to Guardhouse Whole Body Monitor Alarm; Revision 0

RP-QC-460-1003; Additional High Radiation Exposure Controls; Revision 2

RP-AA-460; Controls For High And Very High Radiation Areas; Revision 3

NOSA-QC-QDC-03-06; Health Physics Audit Exit Report; dated April 25, 2003

RP-AA-210; Dosimetry Issue, Usage and Control; Revision 4

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

QIP-1800-01-S01; Refueling Floor High Range ARM #2 Calibration; dated June 6, 2003

QCI-PM-1800-04; Unit 1 ARMs #6 and #11 Calibration; dated November 6, 2003

QIP-1800-01-S01; Unit 1 TIP Room ARM #14 Calibration; dated September 10, 2003

QIP-1800-01-S01; Unit 1 HPCI Room ARM #16 Calibration; dated June 6, 2003

QCI-PM-1800-04; Standby Gas Treatment ARM-16 Calibration; dated January 23, 2003

QCI-PM-1800-05; Radwaste Mixing Tank ARM #5 Calibration; dated August 13, 2003

RP-QC-728; ASP 2/2E S/N 6014 Calibration Record; dated October 22, 2002

QCRP 5822-03; PRM-4/PRM5 S/N GM018 Calibration; dated September 9, 2003

RP-QC-727; PRM-4/PRM5 S/N GM052 Calibration Record; dated September 8, 2003

RP-QC-709; RM-25 S/N GM 3025 Calibration Record; dated September 5, 2003

Siemens Electronic Dosimeter S/N 31058 Calibration Record; dated May 29, 2003

Siemens Electronic Dosimeter S/N 28537 Calibration Record; dated May 25, 2003

QCRP 5410-09; Whole Body Counter Calibration Record; dated April 7, 2003

RP-QC-801; AMP 200 S/N 282 Calibration Record; dated November 13, 2003

RP-QC-801; AMP 200 S/N 283 Calibration Record; dated November 13, 2003

RP-QC-703; AMP 100 S/N 277 Calibration Record; dated June 13, 2003

RP-QC-801; AMP 100 S/N 277 Source Response Check; dated November 14, 2003

Eberline AMS-4 (AM114) Calibration Report; dated August 27, 2003

Eberline AMS-4 (AM112) Calibration Report; dated April 18, 2003

RP-QC-730; SAM-9 S/N 1 Calibration Record; dated November 11, 2003

RP-QC-730; SAM-9 S/N 3 Calibration Record; dated September 11, 2003

PM-7 Calibration Report (PM-1); dated August 19, 2003

PM-7 Calibration Report (PM-3); dated August 15, 2003

RP-QC-704; XETEX Telescan S/N 942 Calibration Record; dated August 6, 2003

RP-QC-801; XETEX Telescan S/N 932 Calibration Record; dated November 10, 2003

QCRP 5823-16; RSO 50E S/N 4020 Calibration Record; dated September 29, 2003

QCRP 5822-07; IPM S/N 8104 Calibration Record; dated August 13, 2003

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CR161920-03; Common Cause Analysis: Trend of SCBA issues; dated July 7, 2003

Focused Area Self Assessment: Internal Dose Program; dated November 11, 2003

AR130525; Non-Response Checked Instrument Use; dated November 5, 2002

AR136856; Shepard Beam Calibrator Interlock Failure; dated December 19, 2002

AR138434; Radioactive Sources With Smearable Contamination; dated January 6, 2003

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AR141324; RIS 0-1805-07 Has Adverse Calibration Trend; dated January 24, 2003

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AR185374; RP-AA-720 Procedural Deficiencies; dated November 7, 2003

AR167806; RP Focus Area Self Assessment Deficiencies; dated July 16, 2003

AR125156; RP Focus Area Self Assessment Deficiencies In Control Room Emergency Air; dated September 20, 2002

AR176488; Control Room Supplied Air Issues; dated September 18, 2003

AR150449; Review Of RIII Utility Violations/Findings In EP Area; dated March 20, 2003

TQ-AA-136; Confined Space Rescue Team Training, page 11; Revision 0



TQ-QC-116-1003; QC Station Chemistry Tech Site Specific Training, page 4; Revision 0

TQ-AA-127; Fire Brigade Training Program, page 14; Revision 1

OP-AA-201-005; Fire Brigade Qualifications, page 3; Revision 2

RP-AA-440; Respiratory Protection Program, page 10; Revision 4

TQ-AA-106; Licensed Operator Requal Training Program, page 12; Revision 2

QCRP-5510-17; Operation Of The Bauer Air Compressor; Revision 5

QAP-0300-03; Operations Shift Manning, pages 1-4; Revision 34

RP-AA-222; Methods For Estimating Internal Exposure From In-Vivo and In Vitro Bioassay Data; Revision 1

SCBA Maintenance Log; S/N: RS078, RS047, RS039, RS038; dated November, 2003

MSA Certification; Registration No. W-1035; dated July 22, 2002

047-39008-2; Quarterly Service Air and SCBA; dated April 28, 2003

047-39008-3; Quarterly Service Air and SCBA; dated July 18, 2003

047-39008-4; Quarterly Service Air and SCBA; dated October 15, 2003

047-39008-5; Quarterly Service Air and SCBA; dated January 29, 2003

Biosystems Certificate of Calibration: Respirator Test Device; dated June 17, 2002 and June 11, 2003

QCRP-5510-21 Attachment C; MSA SCBA Post Use /Post Maintenance Inspection Sheets; dated January 13, 2003

RP-QC-828; SCBA Monthly Inspection Sheet; dated October 21, 2003

QCRP-5510-21; Attachment B; Annual MSA SCBA Bottle Hydrostatic Test Inspection Sheets; dated November 19, 2003

Clinton Fire Equipment, Inc. MSA Bottles Hydrostatic Tests; dated March 31, 2003

PosiCheck3 Test Results, Complete SCBA Tests: S/N 1M256480, NM344229, 1M256172, NN040106, 1M256374; dated May 1, 2003

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TE001; Respiratory Qualifications Reports; dated November 19, 2003

Whole Body Count Internal Dose Calculations; dated May 20, 2003

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

NOA-QC-03-1Q; 1<sup>st</sup> Quarter 2003 Plant Support Trends; dated March 19, 2003

NOA-QC-03-1Q; In Line Instrument and Analytical Equipment; dated March 11, 2003

NOA-QC-03-1Q; T/S Off-Gas Activity Monitoring Program; dated February 25, 2003

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ODCM Changes; dated September 12, 2002

ODCM-SVVP; QC Software Verification and Validation Procedures; Revision 0

2PS2 Radioactive Material Processing and Transportation

OE151766-27; Rad Waste Control

CR-160357; CG1 Bulk chemical and Hazmat Controls; dated May 30, 2003

LS-AA-126-1001; Self Assessment: Rad Material Transportation; dated July 30, 2002

Radwaste Material Condition/Equipment Reliability; dated May 16, 2002

AR167844; Valve Labeling Issue in Radwaste; dated July 16, 2003

AR167606; Unplanned Spread of Contamination in Radwaste; dated July 15, 2003

Quad Cities Station Radioactive Effluent Report for 2001; dated April 5, 2002

2PS3 Radiological Environmental Monitoring Program

RP-AA-503; Unconditional Release Survey Method; Revision 0

RP-AA-500; Radioactive Material Control; Revision 0

RP-AA-651; Station Responsibilities For Exelon Nuclear's Meteorological and REMP Programs; Revision 2

Environmental Incorporated Midwest Laboratory Sampling Procedure Manual; Revision 7

QCCP 0800-11; Liquid Sample Environmental LLD Determination; Revision 10

Counting Room Sample Counting Guide; dated March 21, 2003

Counting Room LLD Tennelec Instruments; dated May 14, 2002

Counting Room LLD GELI Detector # 1; dated May 14, 2002

GELI Detector # 1, Unconditional Release Geometries

Air Sample Collection Data Sheets (Selected); Revision 3

TLD Checkoff Sheets (Selected); Revisions 5 and 6

REMP Update Sheets-Sample Anomalies (Selected); Revision 4

Pump Field Check Sheets (Selected); Revision 11

Pump Status Sheets (Selected); Revision 4

Pump Maintenance Sheets (Selected); Revision 10

Vegetation Sample Collection; dated July 15, 2003

Field Rotameter Calibrations for 2003 (Selected)

Fish Samples; dated May 21, 2003

Land Use Census-Nearest Residences; dated September 15, 2003

Land Use Census-Nearest Livestock; dated September 15, 2003

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165584-10; Nuclear Oversight Review of the REMP; dated August 1, 2003

NOA-QC-03-1Q; In-Line Instruments and Analytical Equipment; dated March 7-11, 2003

NOA-QC-02-4Q; RHR Heat Exchanger Leaks Responses and Evaluations; dated November 14-26, 2003

Selected Control Charts for ATP13, July 1-September 29, 2003; dated October 2, 2003

Inter-laboratory Comparison Program; First Quarter 2002 through Second Quarter 2003

CR-170531; NOS Identified Conflicting Information in ODCM; dated August 12, 2003

CR-1743357; Land Use Census; dated September 4, 2003

CR-118044; Breaker for Environs Station #2 Keeps Tripping; dated July 29, 2002

CR-156373; REMP Focused Area Self Assessment Findings; dated May 6, 2003

CR-167995; Trees Within 100 meters of South MET Tower; dated July 17, 2003

CR-01970; REMP Self Assessment Issues; dated June 22, 2001

CR-01655; Vendor Never Received Air Particulate Samples From Week of May 4, 2001; dated May 29, 2001

Quad Cities Nuclear Station Annual Radiological Environmental Operating Report for 2002; dated May 13, 2003

Exelon Nuclear ODCM; Revision 3

UFSAR Volume 6, Section 11.5.3.1: Environmental Radiation Monitoring; Revision 6

#### 4OA1 Performance Indicator Verification

Control Room Operator Logs; dated October 2002 through October 2003

LS-AA-2050; Monthly Performance Indicator Data Elements for Safety System Unavailability - High Pressure Coolant Injection; Revision 3

LS-AA-2060; Monthly Performance Indicator Data Elements for Safety System Unavailability - Reactor Core Isolation Cooling; Revision 3

Control Room Operator Logs; dated October 2002 through October 2003

LS-AA-2050; Monthly Performance Indicator Data Elements for Safety System Unavailability - High Pressure Coolant Injection; Revision 3

LS-AA-2060; Monthly Performance Indicator Data Elements for Safety System  
Unavailability - Reactor Core Isolation Cooling; Revision 3

40A2 Identification and Resolution of Problems

Procedure Change Paperwork for QCEPM 0200-10; Revision 10; dated June 18, 2003

Condition Report 115362; 2A Reactor Recirculation Motor Generator Set Breaker Failed to Open; dated July 12, 2002

QCEPM 0200-10; Recirc Motor Generator Set Field Breaker Inspection and Test; Revisions 9 through 11

Apparent Cause Evaluation for Condition Report 115362; 2A Reactor Recirculation Motor Generator Set Breaker Failed to Open; dated January 9, 2003

Procedure Change Paperwork for QCEPM 0200-10; Revision 10; dated June 18, 2003

Condition Report 115362; 2A Reactor Recirculation Motor Generator Set Breaker Failed to Open; dated July 12, 2002

QCEPM 0200-10; Recirc Motor Generator Set Field Breaker Inspection and Test; Revisions 9 through 11

Apparent Cause Evaluation for Condition Report 115362; 2A Reactor Recirculation Motor Generator Set Breaker Failed to Open; dated January 9, 2003

Letter from General Electric Nuclear Energy to Mr. John Bailey, CMO Electrical Component Specialist; dated December 13, 2002

Condition Report 179890; Procedure QCEPM 0200-10 Found to be in Error; dated September 29, 2003

Condition Report 181539; Booster Pump Suction Flange Stud Nut Without Full Thread Engagement; dated October 16, 2003

Condition Report 181949; Untimely Condition Report Initiation; dated October 17, 2003

Condition Report 185188; Use of Equipment Status Tags in lieu of a Procedure Revision; dated October 27, 2003

Condition Report 178270; Gross Leakage Through Isolation Valves; dated September 29, 2003

Condition Report 178435; Unable to Open Valve with Current Procedure; dated September 30, 2003

OP-AA-108-102; Equipment Status Tags; Revision 0

HU-AA-104-101; Procedure Use and Adherence; Revision 0

Units 1, 2, and ½ Equipment Status Tag Logs; dated October 9, 2003

QCOP 1200-05; Reactor Water Cleanup Filter Demineralizer Manual Backwash and Precoat; Revision 17

Letter from General Electric Nuclear Energy to Mr. John Bailey, CMO Electrical Component Specialist; dated December 13, 2002

Condition Report 179890; Procedure QCEPM 0200-10 Found to be in Error; dated September 29, 2003

Condition Report 181539; Booster Pump Suction Flange Stud Nut Without Full Thread Engagement; dated October 16, 2003

Condition Report 181949; Untimely Condition Report Initiation; dated October 17, 2003

Condition Report 185188; Use of Equipment Status Tags in lieu of a Procedure Revision; dated October 27, 2003

Condition Report 178270; Gross Leakage Through Isolation Valves; dated September 29, 2003

Condition Report 178435; Unable to Open Valve with Current Procedure; dated September 30, 2003

OP-AA-108-102; Equipment Status Tags; Revision 0

HU-AA-104-101; Procedure Use and Adherence; Revision 0

Units 1, 2, and ½ Equipment Status Tag Logs; dated October 9, 2003

QCOP 1200-05; Reactor Water Cleanup Filter Demineralizer Manual Backwash and Precoat; Revision 17

#### 4OA3 Event Followup

Apparent Cause Evaluation for Condition Report 115362; 2A Reactor Recirculation Motor Generator Set Breaker Failed to Open; dated January 9, 2003

Work Order 99271040; Recirc MG Set Field Breaker; dated August 30, 2001

General Electric Nuclear Energy Special Process Control Sheet 31489A; Failure Inspection/Overhaul AKF-2-25; Revision 1

QCOS 0202-17; Functional Testing of Unit 1 ATWS Recirculation Pump Trip and Alternate Rod Insertion Logic; Revision 0

Information Notice 87-12; Potential Problems with Metal Clad Circuit Breakers, General Electric Type AKF-2-25; dated February 13, 1987

Letter from General Electric Nuclear Energy to Mr. John Bailey, CMO Electrical Component Specialist; dated December 13, 2002

General Electric Nuclear Energy Letter JMA96032 from J. M. Austin to Mr. Larry Bukantis; dated November 6, 1996

Maintenance Instructions for General Electric Power Circuit Breakers

Condition Report 164221; Unit 2 2-0261-34C Emergency Core Cooling System Low Pressure Coolant Injection Recirculation Riser Line Break Detection Differential Pressure

Information Notice 87-12; Potential Problems with Metal Clad Circuit Breakers, General Electric Type AKF-2-25; dated February 13, 1987

Letter from General Electric Nuclear Energy to Mr. John Bailey, CMO Electrical Component Specialist; dated December 13, 2002

General Electric Nuclear Energy Letter JMA96032 from J. M. Austin to Mr. Larry Bukantis; dated November 6, 1996

Maintenance Instructions for General Electric Power Circuit Breakers

#### 71151 Performance Indicator Verification

Dose equivalent Iodine in reactor coolant; dated July 2002-August 2003

Quad Cities Performance Indicator Quarterly Reports for 2002-2003

Electronic Dosimeter Transaction Records for 2003

Quad Cities Radwaste Effluent Report for 2001

Quad Cities 2002 Annual Radiological Environmental Operating Report

Indicating Switch High Side Isolation Valve Found Closed Verses Open; dated July 24, 2003

OP-AA-108-101; Control of Equipment and System Status; Revision 0

Schematic Diagram 4E-2438D; Residual Heat Removal System Relay Logic Division 1; Sheet 4

Schematic Diagram 4E-2438F; Residual Heat Removal System Relay Logic Division 2; Sheet 6

MA-QC-741-206; Unit 2 Low Pressure Coolant Injection Recirculation Riser High D/P Functional Test; Revision 0

MA-AA-716-100; Maintenance Alterations Process; Revision 1

HU-AA-101; Human Performance Tools and Verification Practices; Revision 1

Licensee Event Report 265/03-003; Low Pressure Coolant Injection Differential Pressure Instrument Inoperable due to Misposition of Instrument Valve; dated August 18, 2003

4OA3 Event Followup

Apparent Cause Evaluation for Condition Report 115362; 2A Reactor Recirculation Motor Generator Set Breaker Failed to Open; dated January 9, 2003

Work Order 99271040; Recirc MG Set Field Breaker; dated August 30, 2001

General Electric Nuclear Energy Special Process Control Sheet 31489A; Failure Inspection/Overhaul AKF-2-25; Revision 1

QCOS 0202-17; Functional Testing of Unit 1 ATWS Recirculation Pump Trip and Alternate Rod Insertion Logic; Revision 0



## LIST OF ACRONYMS USED

ALARA	As Low As Is Reasonably Achievable
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
ERV	Electromatic Relief Valve
ODCM Offsite	Dose Calculation Manual
RETS/ODCM	Radiological Environmental Technical Specifications/Offsite Dose Calculation Manual
SSC	Structures, Systems, and Components