

May 3, 2007

Mr. Christopher M. Crane  
President and Chief Nuclear Officer  
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 05000254/2007002;  
05000265/2007002

Dear Mr. Crane:

On March 31, 2007, 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 April 3, 2007, with Mr. Tulon and other members of your staff.

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

Based on the results of this inspection, the inspectors identified four findings of very low safety significance (Green). Three of these issues involve violations of NRC requirements. However, because these violations were of very low safety significance and because the issues were entered into the licensee's corrective program, the NRC is treating these findings and 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, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; 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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

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

Docket Nos. 50-254; 50-265; 72-053  
License Nos. DPR-29; DPR-30

Enclosure: Inspection Report 05000254/2007002; 05000265/2007002  
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Quad Cities Nuclear Power Station  
Plant Manager - Quad Cities Nuclear Power Station  
Regulatory Assurance Manager - Quad Cities Nuclear Power Station  
Chief Operating Officer  
Senior Vice President - Nuclear Services  
Senior Vice President - Mid-West Regional  
Operating Group  
Vice President - Mid-West Operations Support  
Vice President - Licensing and Regulatory Affairs  
Director Licensing - Mid-West Regional  
Operating Group  
Manager Licensing - Dresden and Quad Cities  
Senior Counsel, Nuclear, Mid-West Regional  
Operating Group  
Document Control Desk - Licensing  
Vice President - Law and Regulatory Affairs  
Mid American Energy Company  
Assistant Attorney General  
Illinois Emergency Management Agency  
State Liaison Officer, State of Illinois  
State Liaison Officer, State of Iowa  
Chairman, Illinois Commerce Commission  
Chief Radiological Emergency Preparedness Section,  
Dept. Of Homeland Security  
D. Tubbs, Manager of Nuclear  
MidAmerican Energy Company

C. Crane

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Assistant Attorney General  
Illinois Emergency Management Agency  
State Liaison Officer, State of Illinois  
State Liaison Officer, State of Iowa  
Chairman, Illinois Commerce Commission  
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-254, 50-265

License Nos: DPR-29, DPR-30

Report No: 05000254/2007002 and 05000265/2007002

Licensee: Exelon Nuclear

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

Location: Cordova, Illinois

Dates: January 1, 2007, through March 31, 2007

Inspectors: K. Stoedter, Senior Resident Inspector  
M. Kurth, Resident Inspector  
R. Daley, Senior Reactor Inspector  
J. Jandovitz, Reactor Inspector  
R. Jickling, Senior Emergency Preparedness Analyst  
J. McGhee, Reactor Engineer  
D. McNeil, Senior Operations Engineer  
W. Slawinski, Senior Health Physics Inspector  
R. Ganser, Illinois Emergency Management Agency

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000254/2007002, 05000265/2007002; 01/01/2007 - 03/31/2007; Quad Cities Nuclear Power Station, Units 1 & 2; Surveillance Testing; Radiation Monitoring Instrumentation and Protective Equipment; Event Followup; Other.

The report covered a 3-month period of inspection by regional and resident inspectors. In addition, this report provides the results of announced inspections by regional emergency preparedness, licensed operator requalification program, and radiation protection inspectors. Four Green findings, three of which were Non-Cited Violations (NCVs), 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. NRC-Identified and Self-Revealing Findings

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

- Green. A self-revealed finding was identified when Unit 2 experienced an unexpected half Group I containment isolation signal on January 23, 2007. The half isolation signal was caused by the licensee's failure to have procedures appropriate to the circumstance for replacing the main steam line low pressure time delay relays. As a result, one of eight relays installed in 1991 was allowed to remain in operation until it failed. The inspectors determined that the failure to have procedures for replacing the relays was a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings." Immediate corrective actions included replacing the failed relay, resetting the half containment isolation signal, and implementing a preventive maintenance activity to replace the remaining relays at a later date.

This finding was more than minor because it was associated with the procedure quality attribute of the Initiating Events Cornerstone. It also affected the cornerstone objective of limiting the likelihood of events that upset plant stability. The inspectors determined that the finding was of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. Lastly, the inspectors concluded that this finding was cross-cutting in the area of Human Performance, Resources, because the licensee did not have complete, accurate, and up-to-date procedures for replacing the relays. (Section 4OA3.2)

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## Cornerstone: Mitigating Systems

- Green. A self-revealed finding was identified on January 1, 2007, when an initial license trainee tripped the "A" control room ventilation system during a training evolution. The inspectors determined that inadequate oversight of the training evolution by the task performance evaluator contributed to this issue. No violation of NRC requirements was identified because the A control room ventilation system was non-safety related.

The failure to perform and provide appropriate oversight of training activities was determined to be more than minor because, if left uncorrected, it would lead to the unexpected shut down of other risk significant equipment and the performance of negative training. This finding was of very low safety significance because it did not represent a degradation of the control room radiological barrier, a degradation of the control room smoke or toxic gas barrier, or an actual open pathway in the reactor containment. The inspectors determined that this finding was cross-cutting in the area of Human Performance, Work Practices, because the licensee failed to ensure that the supervisory and management oversight of work activities was appropriate to ensure that nuclear safety was supported. (Section 4OA3.1)

Green. The team identified a finding of very low safety significance involving the replacement of an environmentally qualified (EQ) Category I component with an EQ Category II component. Specifically, a Non-Cited Violation of 10 CFR 50.49, was associated with this finding, in that, in 2004, the licensee replaced the Target Rock Power Operated Relief Valves, qualified Category I in accordance with environmental qualification requirements, with Dresser Electromatic Relief Valves, qualified as Category II components, which was not allowed under the regulation. Corrective actions for this issue included evaluating whether the currently installed valves could be qualified as EQ Category I components.

The finding was more than minor because it was associated with the design control attribute of the Mitigating System cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance because the valves continued to be operable based upon qualification to EQ Category II. Therefore, reasonable confidence remained that the valves would perform their safety function under accident conditions. This finding is related to the cross-cutting element of Human Performance, Decision Making, in that the licensee did not use conservative assumptions in the decision to replace EQ Category I valves with EQ Category II valves. Specifically, the licensee continued to rely on an incorrect interpretation that EQ requirements were met. (Section 4OA5.2)

## Cornerstone: Emergency Preparedness

- Green. The inspectors identified a Green finding and a Non-Cited Violation of NRC requirements on February 8, 2007, due to the licensee's failure to complete hydrostatic tests on multiple self-contained breathing apparatus (SCBA) air bottles at the required frequency. The inspectors determined that approximately 12 percent of the in-service emergency response related SCBA air bottles had not been tested within the previous 3-year period as required by licensee procedures.

The issue was more than minor because it was associated with the facilities/equipment attribute of the Emergency Preparedness Cornerstone. The finding also affected the cornerstone objective of ensuring the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors determined that the issue resulted in a failure to comply with 10 CFR 50.54(q) and the Emergency Plan requirements associated with one of the Planning Standards in 10 CFR 50.47(b). The issue also represented a degradation of the emergency worker protection portion of the Planning Standard provided in 10 CFR 50.47(b)(10) that involved more than an isolated, small percentage of the licensee's SCBA equipment. Since the finding did not represent a functional failure of the Planning Standard, the finding was determined to be of very low safety significance. This finding was also cross-cutting in the area of Human Performance, Resources, because the principal cause of the problem was the lack of an adequate procedure and process to ensure that SCBA bottles were tested at the proper frequency and tracked in the licensee's inventory. Corrective actions for this issue included hydrostatic testing of the affected bottles, verification that all other SCBA bottle hydrostatic tests were current, expanding the SCBA bottle monthly inspection requirements, and plans to re-evaluate the process used to introduce newly acquired SCBA equipment into the licensee's inventory. (Section 2OS3.6)

### B. Licensee-Identified Violations

No findings of significance were identified.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at or near full power until March 10 when the unit began a scheduled coast down in preparation for the upcoming refueling outage. Reactor engineering personnel estimated that generation would be reduced by approximately 3 megawatts thermal per day until the beginning of the refueling outage. Other minor power reductions occurred during the period to conduct planned control rod sequence exchanges, control rod exercising, and turbine testing.

Unit 2 operated at or near full power until February 27 when operators lowered reactor power to 85 percent to replace a 2C feedwater pump seal. Immediately after securing the feedwater pump, operations personnel identified that condenser vacuum was degrading. The operators took actions to identify and address the source of the degrading vacuum. However, these efforts were unsuccessful and a manual reactor scram was inserted at 0120 on February 28. Following the scram, the licensee identified that a steam jet air ejector system leak had caused the condenser vacuum to degrade. During the forced outage, the licensee repaired the steam jet air ejector leak and completed the 2C feedwater pump seal replacement. Unit 2 returned to full power levels on March 2.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors assessed the operability and functionality of the systems listed below by performing a partial walkdown of each system. The walkdowns were performed during times when redundant systems or trains were removed from service for maintenance. The inspectors used system drawings, equipment lineup procedures, and normal system operating procedures to determine the proper position for each component within the selected system. The inspectors then compared this information to the actual equipment position found in the plant. The inspectors also assessed the condition of associated breakers, valves, instrumentation, and piping supports by visually inspecting each component. The inspectors reviewed a list of open work requests and issue reports to assess whether there were any known equipment deficiencies which could impact the operability or functionality of the systems selected for review. Lastly, the inspectors reviewed the corrective action program database to verify that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers.

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- 1B Core Spray;
- 1B Residual Heat Removal Service Water;
- Unit 2 Emergency Diesel Generator; and
- Unit 2 Reactor Core Isolation Cooling.

This inspection represented the completion of four quarterly samples.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

The inspectors used procedures and electrical schematics to perform an equipment alignment verification of the Unit 1 and Unit 2 4kV, 480 Vac, and 125 Vdc breakers. These systems were selected because alternating current (ac) and direct current (dc) distribution were significant contributors in the probabilistic risk model and the breaker components were principle active components in the distribution systems. The inspectors reviewed the licensee's corrective action program records from June 2006 to December 2006 to verify that breaker issues were being identified at the appropriate threshold and resolution of issues was appropriate. The inspectors also reviewed open work orders to determine if there were any outstanding issues that could impact performance of the distribution systems.

This review represented the completion of one semi-annual walkdown sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Fire Protection - Tours

a. Inspection Scope

The inspectors conducted a tour of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; fire detection and suppression equipment was available for use; that passive fire barriers were maintained in good material condition; and that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with the licensee's fire plan.

- Safe Shutdown Makeup Pump Room (Fire Zone 5.0);
- Unit 1 High Pressure Coolant Injection Room and Tunnel (Fire Zone 11.1.3);
- 1B Core Spray System (Fire Zone 11.2.1);

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- 1A Core Spray System (Fire Zone 11.2.3);
- 1A Residual Heat Removal System (Fire Zone 11.2.4); and
- 2A Core Spray System (Fire Zone 11.3.3).

This inspection represented the completion of six quarterly samples.

b. Findings

No findings of significance were identified.

.2 Fire Protection - Drill Observation

a. Inspection Scope

The inspectors observed a fire drill conducted on the 623 ft. elevation of the Unit 1 reactor building on March 15, 2007. The drill was observed to evaluate the readiness of the fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

This inspection represented the completion of one annual sample.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

On January 17 the inspectors reviewed the licensee's program for inspecting, cleaning, and maintaining the Unit 1 high pressure coolant injection room cooler. This item was chosen for inspection because operation of the cooler ensured that the high pressure coolant injection room temperature remained below the equipment qualification limits during system operation. The inspectors observed the as-found condition of the room cooler including the inspection of the tube bundle and the cooler flanges. The inspectors focused on areas where silt or other debris could accumulate and block portions of the tube bundle. The inspectors also reviewed the licensee's calculation performed to determine the number of cooler tubes allowed to be blocked by debris.

The inspectors then assessed the past functionality of the cooler by comparing the calculation's results to the actual number of tubes found blocked during the as-found inspection.

On March 19 the inspectors reviewed the activities associated with recent 1B residual heat removal heat exchanger thermal performance testing. The inspectors chose this sample for review because the licensee conducted performance testing on very few heat exchangers. The inspectors compared the test methodology provided in QCOS 1000-29, "Residual Heat Removal Heat Exchanger Thermal Performance Test," to the guidance contained in EPRI TR-107397, Revision 3, "Service Water Heat Exchanger Testing Guidelines." The inspectors discussed the testing with the responsible engineer and reviewed issue reports to determine whether previously identified instrumentation problems complicated the test performance. Lastly, the inspectors reviewed the test results and compared them with the design basis information to ensure that the heat exchanger remained capable of removing worst-case post accident heat loads.

This inspection represented the completion of two annual samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

On February 27, 2007, the inspectors observed an operations crew during an as-found exam in the simulator. The exam scenario consisted of a loss of the Unit 1 reserve auxiliary transformer followed by a loss of coolant accident.

The inspectors evaluated crew performance in the areas of:

- clarity and formality of communications;
- ability to take timely actions in the safe direction;
- prioritization, interpretation, and verification of alarms;
- procedure use;
- control board manipulations;
- oversight and direction from supervisors; and
- group dynamics.

The inspectors verified that the crew completed the critical tasks listed in the above scenario. If the critical tasks were not met, the inspectors verified that crew and operator performance errors were detected and adequately addressed by the evaluators. The inspectors verified that the evaluators effectively identified actions requiring remediation and appropriately indicated when removal from shift activities was warranted. Lastly, the inspectors observed the licensee's critique to verify that

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weaknesses identified during this observation were noted by the evaluators and discussed with the crew.

This inspection represented the completion of one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Implementation (71111.12)

a. Inspection Scope

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

- Control Room Ventilation and
- 480 Vac Motor Control Centers.

The inspectors' review included an examination of specific issues documented in issue reports, an evaluation of maintenance rule performance criteria and maintenance work practices, an assessment of common cause issues and 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.

This inspection represented the completion of two samples.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the following activities to verify that the appropriate risk assessments were performed prior to removing equipment from service. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors verified the appropriate use of the licensee's risk assessment tool and risk categories in accordance with procedures.

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- Emergent maintenance to the Unit ½ emergency diesel generator on January 11;
- Work Week 3 including routine maintenance and testing of the Unit 2 high pressure coolant injection system and emergent maintenance on the 1A circulating water pump motor cables and the 1A service water pump breaker;
- Work Week 4 including planned maintenance on the 1B control rod drive pump, 2A stator water cooling pump, and control room emergency ventilation system, and planned surveillances on the Unit 1 reactor core isolation cooling system;
- Work Week 6 including planned maintenance on the 1A residual heat removal system;
- Work Week 8 including planned maintenance and testing of the Unit ½ reactor building closed cooling water pump, Unit 1 service water strainer basket, and emergent maintenance and testing of the Unit 2 high pressure coolant injection system; and
- Work Week 10 including routine surveillances on the 1B residual heat removal loop, the Unit 2 emergency diesel generator, and the Unit 2 reactor core isolation cooling system, planned maintenance on the Unit 2 instrument air compressor, and emergent maintenance on the 1D residual heat removal pump.

This inspection represented the completion of six samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated the technical adequacy of the evaluations listed below to ensure that Technical Specification operability or functionality was properly justified and that no unrecognized increase in risk occurred. The inspectors reviewed the Updated Final Safety Analysis Report to verify that the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures implemented to verify that the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sampling of issue reports to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- Issue Report 585734 - "B" Control Room Ventilation Aggregate Operability Review;
- Issue Report 593616 - Unit 2 High Pressure Coolant Injection Motor Speed Changer is Hot;
- Issue Report 597959 - QCOS 1000-04 Residual Heat Removal Service Water Pump Operability Test Results Unsatisfactory;
- Issue Report 580419 - Gap Below Residual Heat Removal Service Water Separation Screen;

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- Issue Report 585382 - NRC Identified Concern with Environmental Qualifications for Unit 2 Electromatic Relief Valve Actuator; and
- Issue Report 583782 - Potential Declutch Tripper Pin Issue on Limitorque Motor Operated Valve Actuator Soft Clutches Size SB(SMB) 1-4 .

This inspection represented the completion of six samples.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

During the inspection period, the inspectors reviewed the following permanent plant modification:

- Engineering Changes Associated with Replacing the Coupling and Support of the Stator Water Cooling Pump Motors for Each Unit.

The inspectors reviewed the design adequacy of the modification by verifying one or more of the following:

- Replacement components were compatible with physical interfaces;
- Replacement component properties met functional requirements;
- The modification would not result in a different type of equipment failure mechanism;
- Welding instructions were complete, accurate, and adhered to during modification installation; and
- The modification had the desired effect on improving overall system performance.

The inspectors verified that the post modification testing demonstrated system functionality by observing the test and ensuring that no unintended system interactions occurred, system performance characteristics were met, and that the post-modification test results met the pre-established acceptance criteria. The inspectors also reviewed issue reports related to permanent plant modifications to ensure that the licensee was entering these issues into their corrective action program.

This inspection represented the completion of one sample.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedure to verify that the procedure adequately tested the function(s) that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test, or reviewed the test data, to verify that the test results adequately demonstrated restoration of the affected safety function(s).

- QCOS 5600-05 - Turbine Generator Monthly Testing following maintenance on the 2A stator water pump;
- TIC 1666 - Post Maintenance Testing of Relay 0-9400-105-CR5ISO following a relay replacement on the control room emergency ventilation system;
- QCOS 2300-23 - High Pressure Coolant Injection Motor Speed Changer Timing Test following the replacement of the Unit 2 high pressure coolant injection motor speed changer;
- TIC 1695 - Unit 1 B Loop Low Pressure Coolant Injection and Containment Cooling Modes of Residual Heat Removal Non-Outage Logic Test following replacement of the time delay unit for relay 1-1000-10A-K48B;
- QCOS 5750-11 - Control Room Emergency Ventilation System Test following planned maintenance on the control room ventilation system; and
- QCOS 1000-09 - Residual Heat Removal Pump Loop Operability Test following troubleshooting and repair of the 1D residual heat removal pump breaker.

This inspection represented the completion of six samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

As discussed earlier in this report, operations personnel inserted a manual scram on February 28 due to degrading Unit 2 condenser vacuum. The scram resulted in a 39 hour forced outage to identify and address the condenser vacuum issues. During the outage, the inspectors performed the following activities:

- Attended control room operator and/or outage management turnover meetings to verify that the current risk status was well understood and communicated;

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- Performed walkdowns of the main control room to observe the alignment of systems important to safety; 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.

The inspectors observed the following specific activities, as appropriate:

- Mode 3 activities;
- Troubleshooting efforts associated with the loss of condenser vacuum; and
- Reactor startup and power ascension.

This inspection represented the completion of one outage sample.

b. Findings

No findings of significance were identified. See Section 4OA3.3 of this report for additional details.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed the surveillance tests, and/or reviewed the test data for the selected risk-significant structures, systems, and components listed below, to assess whether the structures, systems, and components met the requirements of the Technical Specifications; the Updated Final Safety Analysis Report; and American Society of Mechanical Engineers Section XI. The inspectors also determined whether the testing effectively demonstrated that the structures, systems, and components were operationally ready and capable of performing their intended safety functions.

- QCOS 7500-05 - Standby Gas Treatment System Monthly Operability Test performed on January 16, 2007;
- QCOS 1000-28 - Residual Heat Removal Service Water Pump Performance Test and QCOS 1000-04 - Residual Heat Removal Pump B Flow Test performed on February 7, 2007;
- QCOS 2300-13 - High Pressure Coolant Injection System Manual Initiation Test performed on February 12, 2007;
- QCOS 1000-33 - Unit 1 B Loop Low Pressure Coolant Injection and Containment Cooling Modes of Residual Heat Removal Non-Outage Logic Test performed on March 14, 2007;
- QCOS 1300-06 - Reactor Core Isolation Cooling Valve Timing Test performed on March 13, 2007;
- QCOS 6600-20 - (Unit ½) Diesel Generator Endurance and Margin/Full Load Reject/Hot Restart Test performed on January 11 and 13, 2007; and
- QCOS 5750-11 - Control Room Emergency Ventilation System Test performed on January 26 through 28, and February 9, 2007.

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This inspection represented the completion of five routine and two in-service test samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the temporary modification listed below and the associated 10 CFR 50.59 screening, and compared each against the Updated Final Safety Analysis Report and Technical Specification to verify that the modification did not affect operability or availability of the affected system. The inspectors walked down the modification to ensure that it was installed in accordance with the modification documents and reviewed post-installation and removal testing to verify that the actual impact on permanent systems was adequately verified by the tests.

- Temporary Modification 364059 - Install Data Recorder for Monitoring "B" Control Room Ventilation Flow Control Valve Signals.

This inspection represented the completion of one sample.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP2 Alert and Notification System Evaluation

a. Inspection Scope

The inspectors reviewed and discussed with corporate Emergency Preparedness (EP) staff records for the operation, maintenance and testing of the alert and notification system (ANS) for the Quad Cities Station Emergency Planning Zone, to verify that the ANS equipment was adequately maintained and tested during 2005 and 2006, in accordance with emergency plan commitments and procedures. The inspectors reviewed records of 2005 and 2006 preventive maintenance performed on ANS equipment to verify that annual preventive maintenance was completed. Also, the inspectors reviewed samples of 2005 and 2006 non-scheduled maintenance activity records, to determine whether equipment trouble-shooting and repairs were completed in a timely manner. Additionally, the inspectors reviewed records of ANS tests conducted from August 2005 through December 2006 to determine if Quad Cities and corporate EP staff were effectively using the corrective action program to document, correct, and trend siren problems identified.

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This inspection represented the completion of one inspection sample.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System

a. Inspection Scope

The inspectors reviewed and discussed procedures on the primary and alternate processes of augmenting the on-shift Emergency Response Organization (ERO). The inspectors also discussed the EP staff's process for maintaining the Quad Cities Station's ERO roster and ERO personnel's contact information. The inspectors reviewed records of unannounced off-hours augmentations of the on-shift ERO, which included call-in tests results between February 2005 and January 2007, to determine the adequacy of ERO members' response and the use of the corrective action program for identified response problems. The inspectors reviewed a sample of training records for 28 ERO members, who were assigned to key and support positions, to verify that they were currently trained for their assigned positions.

This inspection represented the completion of one inspection sample.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses

a. Inspection Scope

The inspectors reviewed Nuclear Oversight (NOS) staff's 2005 and 2006 audits of the licensee's EP program to verify that these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors reviewed sample records of EP drills and exercises conducted during 2005 and 2006 to verify that these activities were adequately critiqued. Samples of CAP records and associated corrective actions were reviewed to determine if weaknesses and deficiencies identified in the following types of self-assessments were adequately addressed: critiques of EP drills and exercises; NOS 2005 and 2006 station EP audits; and Quad Cities Station EP staff 2006 and 2007 self-assessments.

This inspection represented the completion of one inspection sample.

b. Findings

No findings of significance were identified.

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1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors evaluated the conduct of a routine emergency preparedness drill on March 13, 2007, to identify any weaknesses or deficiencies in classification, notification, and protective action recommendation activities. The inspectors observed emergency response operations in the simulated control room to verify that event classification and notifications were done in accordance with procedures. The inspectors also attended the licensee critique to compare any inspector-observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying failures.

This inspection represented the completion of one annual sample.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the Quad Cities Station Updated Final Safety Analysis Report to identify applicable radiation monitors associated with measuring transient high and very high radiation areas, including those used in remote emergency assessment. The inspectors identified the types of portable radiation detection instrumentation used for job coverage of high radiation area work, including instruments used for underwater surveys, fixed area radiation monitors used to provide radiological information in various plant areas, and continuous air monitors used to assess airborne radiological conditions and consequently work areas with the potential for workers to receive a 50 millirem or greater committed effective dose equivalent. Contamination monitors, whole body counters and those radiation detection instruments utilized for the release of personnel and equipment from the radiologically controlled area (RCA) were also identified.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

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.2 Walkdowns of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors conducted walkdowns of selected area radiation monitors (ARMs) in the Unit 1 and Unit 2 Reactor and Turbine Buildings, and in the common Unit 1/2 Filter and Radwaste Buildings to verify that they were located as described in the Updated Final Safety Analysis Report and were optimally positioned relative to the potential source(s) of radiation they were intended to monitor. Walkdowns were also conducted of those areas where portable survey instruments were source checked and maintained for radiation protection (RP) staff use to determine if those instruments designated "ready for use," were sufficient in number to support the RP program, had current calibration stickers, were operable, and were in good physical condition. Additionally, the inspectors observed the licensee's portable survey instrument calibration unit and the radiation sources used for operability checks of various radiation measuring instruments to assess their material condition, and discussed their use with RP staff to determine if they were used adequately. The inspectors evaluated compliance with licensee procedures while RP personnel demonstrated the methods for performing source checks of portable survey instruments and for source checking personnel contamination and portal monitors located at the egress to the RCA.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Calibration and Testing of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors selectively reviewed radiological instrumentation associated with monitoring transient high and/or very high radiation areas, instruments used for remote emergency assessment, and radiation monitors used to identify personnel contamination and for assessment of internal exposures to verify that the instruments had been calibrated as required by the licensee's procedures, consistent with industry and regulatory standards. The inspectors also reviewed alarm setpoints for selected ARMs, for personnel contamination monitors and for portal (egress) monitors to verify that they were established consistent with the Updated Final Safety Analysis Report or Technical Specifications, as applicable, and were consistent with industry practices and regulatory guidance. Specifically, the inspectors reviewed calibration procedures and the most recent calibration records for the following radiation monitoring instrumentation and instrument calibration equipment:

- Unit 1 and Unit 2 Drywell High Range (Accident) Radiation Monitors;
- Unit 1 and Unit 2 Drywell Continuous Air Monitors;

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- Unit 1 and Unit 2 Reactor Building Vent Radiation Monitors;
- Unit 1 TIP Room ARM;
- Unit 2 HPCI Room ARM;
- Unit 1 Off-Gas Charcoal Bed Vault ARM;
- Portal (Gamma) Monitors used at RCA and Plant egresses;
- Personnel Contamination Monitors used at RCA egress;
- Portable Instruments for Underwater & Area (Gamma and Neutron) Surveys;
- Instrument Calibrator (and the associated instruments used to measure calibrator output); and
- Whole Body Counter.

The inspectors determined what actions were taken when, during calibration or source checks, an instrument was found significantly out of calibration or exceeded as-found acceptance criteria. Should that occur, the inspectors verified that the licensee's actions would include a determination of the instruments's previous usages and the possible consequences of that use since the prior calibration. The inspectors also discussed with RP staff the Quad Cities Station 10 CFR Part 61 source term (radionuclide mix) to determine if the calibration sources used were representative of the plant source term and that difficult to detect nuclides were scaled into whole body count dose determinations.

The inspectors discussed the operability of the high radiation sampling system with chemistry supervision and reviewed surveillance records for 2005 and 2006, to determine if system capability was demonstrated consistent with regulatory commitments described in NRC correspondence for License Amendment No. 212 (Unit 1) and License Amendment No. 206 (Unit 2). Those amendments eliminated the high radiation sampling system as a required post accident sampling system from the Technical Specifications, provided the licensee maintained and developed contingency plans for obtaining and analyzing highly radioactive samples of reactor coolant, the suppression pool and the containment atmosphere.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed licensee corrective action program documents and any 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. Licensee self-assessments, audits and issue reports were also reviewed to verify that problems with radiological instrumentation or self-contained breathing apparatus (SCBA) equipment were identified, characterized, prioritized, and

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resolved effectively using the corrective action program. In particular, the inspectors reviewed an issue report and an associated Quick Human Performance Investigation Report that involved an alarming condition on the ARM for the Reactor Building overhead crane during work activities on the refuel floor in January 2007.

While no internal exposure with a committed effective dose equivalent greater than 50 millirem occurred since the last inspection in this area, the inspectors evaluated the licensee's methodology for internal dose assessment including review of dose calculation results for intakes less than 50 millirem.

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, as applicable. Members of the RP staff 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 based on the following:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Resolution of Non-Cited Violations tracked in the corrective action system; and
- Identification and implementation of effective corrective actions.

The inspectors determined if the licensee's self-assessment and audit activities completed for the approximate 2 year period that preceded the inspection were identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution, as applicable.

These reviews represented three inspection samples.

b. Findings

Refuel Floor Crane Operator Disconnects the Audible Alarm on an Area Radiation Monitor

During work on the refuel floor in January 2007, the licensee identified that the individual operating the reactor building overhead crane disconnected the audible alarm on the crane ARM without authorization, contrary to the licensee's procedure. The ARM was positioned on the underside of the crane mast to monitor area radiological conditions during movement of material using the crane.

On January 29, 2007, reactor services personnel (two fuel handlers and a crane operator) were tasked to decontaminate two large boxes that housed contaminated equipment and relocate the boxes from the reactor building refuel floor down to the trackway. When the reactor building overhead crane was started-up in preparation to

move the boxes, the ARM for the crane alarmed indicating a potential area dose rate problem and/or ARM malfunction. The local ARM indicator in the crane cab was checked by the crane operator and showed a dose rate of 2 millirem/hour, a value below the 15 millirem/hour high alarm setpoint for the ARM. The crane operator unsuccessfully attempted to reset the alarm, then proceeded to disconnect the audible alarm from the ARM which silenced the alarm horn. The horn was disconnected without authorization and without notifying plant supervision.

With the alarm silenced, the crane was used to relocate the reactor cavity wall washing machine from its storage container, while the boxes originally intended to be moved were being decontaminated. Following that activity, the signalman that was assisting the crane operator stopped all work associated with the crane when other workers on the refuel floor questioned how the alarm was silenced since it purportedly alarmed the week before during maintenance on the crane. The signalman then noticed the audible alarm was disconnected, instructed it be reconnected (at which time it again alarmed), and involved staff vacated the refuel floor and reported the issue to supervision.

This event was recorded in the licensee's Corrective Action Program as Issue Report 584636. The crane operator's qualifications were suspended and a prompt investigation was completed by the licensee. The licensee's prompt investigation report documented that the crane operator assumed that the alarm for the ARM had malfunctioned since the local indication in the crane cab indicated that the dose rate measured by the ARM was only 2 millirem/hour, and also because the radiation alarm actuated crane interlock (which prohibits crane movement upon alarm) failed to function. Also, according to the licensee's prompt investigation, the crane operator reasoned that it was acceptable to disconnect the alarm since that was allowed by procedure under certain circumstances, with concurrence from the Operations and RP Departments. However, those circumstances did not exist since a high radiation alarm was not anticipated given the dose rates on the two boxes intended to be moved.

The electronic dosimetry worn by the crane operator was analyzed by the RP staff following the incident which showed a radiation dose to the crane operator less than 1 millirem, with the highest dose rate field at 1 millirem/hour. Area radiation monitor trouble-shooting subsequent to the event disclosed that the ARM alarm and its crane interlock had malfunctioned due to a problem with the instrument's circuitry.

Based on the results of the licensee's preliminary (prompt) investigation and the inspectors review of the circumstances, the crane operators actions appear to be in violation of licensee procedure QCMM 5800-05, "Reactor Building Overhead Crane Utilization." That procedure requires RP and Operations Department approval to: (1) resume operations following a high radiation alarm on the crane radiation monitor, or (2) handle radioactive material with a malfunctioning radiation monitor. This event remains under review by the NRC and is categorized as an Unresolved Item (**URI 05000254/2007002-01; 05000265/2007002-01**).

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.5 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors selectively verified that calibrations for those survey instruments previously used to perform job coverage surveys and for those currently designated for use had not lapsed. The inspectors reviewed instrument issue logs for selected dates in late 2006 into 2007 to determine if response checks of portable survey instruments and checks of instruments used for unconditional release of materials and workers from the RCA were completed prior to instrument use or daily, as required by the licensee's procedure. The inspectors also discussed instrument calibration methods and source response check practices with RP staff and observed staff complete instrument source checks prior to instrument use.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.6 Self-Contained Breathing Apparatus Maintenance/Inspection and Emergency Response Staff Qualifications

a. Inspection Scope

The inspectors reviewed aspects of the licensee's respiratory protection program for compliance with the requirements of Subpart H of 10 CFR Part 20 and to determine if SCBA equipment was properly maintained and ready for emergency use. The inspectors reviewed records of inspection and functional tests completed in 2006 for all SCBAs staged in the plant to support the licensee's emergency response program. The inspectors evaluated the licensee's capabilities for refilling and transporting SCBA air bottles to and from the control room during emergency conditions. The inspectors determined if control room staff designated for the active on-shift duty roster were trained, respirator fit tested, and medically certified to use SCBAs. Additionally, the inspectors reviewed SCBA qualification records for the licensee's radiological emergency teams including the RP, chemistry, and maintenance staffs to determine if a sufficient number of staff were qualified to fulfill emergency response positions consistent with the licensee's emergency plan and the requirements of 10 CFR 50.47. The inspectors also reviewed the respiratory protection training lesson plan to assess its overall adequacy relative to Subpart H of 10 CFR Part 20 and to determine if personal SCBA air bottle change-out was included as part of the lesson plan.

The inspectors walked down SCBA equipment maintained in the control room, the Turbine, Reactor and Station Blackout Buildings, as well as spare SCBA air bottle stations along with SCBA equipment staged for emergency use in other areas within and outside the main RCA. During the walkdowns, the inspectors examined numerous SCBA units to assess their material condition, to determine if air bottle hydrostatic tests

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were current, and if bottles were pressurized to meet procedural requirements. The inspectors reviewed records of SCBA equipment inspection and testing, including regulator flow tests, and observed a member of the licensee's staff demonstrate the methods used to conduct the inspections and functional tests to determine if these activities were performed consistent with procedure and the equipment manufacturer's recommendations. The inspectors also determined through record reviews if the required air cylinder hydrostatic testing was documented and current, if the Department of Transportation required retest air cylinder markings were in place for numerous randomly selected SCBA units and spare air bottles, and if air quality for the compressor used to fill SCBA air bottles was routinely tested to verify Grade-D quality. Additionally, the inspectors reviewed Mine Safety Appliance issued training certificates for those licensee staff that performed repairs of SCBA pressure regulators in 2005 and 2006, to determine if those employees that performed maintenance on components vital to equipment function were qualified.

These reviews represented two inspection samples.

b. Findings

Introduction: An inspector-identified finding of very low safety significance, and an associated violation of NRC requirements, were identified for the failure to complete hydrostatic tests on SCBA air bottles designated for emergency response organization use at the required frequency.

Description: During walkdowns of in-service SCBA equipment on February 8, 2007, the inspectors identified that several SCBA air bottles did not have current hydrostatic tests. The SCBA equipment was strategically located in various areas of the plant to support emergency response activities including the main control room. Composite fiberglass-type bottles were required by licensee procedure, consistent with industry standards, to be hydrostatically tested every 3 years and steel bottles every 5 years. Following the inspectors identification of the problem, the licensee determined that approximately 12 percent of the SCBA air bottles (26 bottles) in the station's in-service inventory had not been tested within the previous 3-year period as required for composite fiberglass-type bottles. The licensee subsequently determined that the 26 bottles had not been hydrostatically tested for periods ranging from just over 3 years up to nearly 7 years. Following identification of the problem, the bottles were delivered to a vendor, hydrostatically tested, and all passed acceptance test criteria.

According to the licensee's preliminary evaluation, the bottles were acquired in 2001 and placed into service without the knowledge of the RP staff that are responsible for SCBA equipment inspection. Consequently, those particular bottles were not tracked as part of the licensee's bottle inventory. While the licensee performed monthly inspections of all in-service SCBA equipment including all air bottles, those inspections failed to identify the problem because the procedure governing the inspection activity did not require that bottles be checked to ensure hydrostatic tests were current.

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The principal cause of the problem was determined to be an inadequate procedure and process to ensure that acquired bottles were verified to be tested and tracked in the appropriate inventory control system before being placed in-service. Additionally, the lack of an adequate inspection procedure allowed the problem to continue undetected for several years.

Analysis: The failure to complete hydrostatic tests on all in-service SCBA bottles at intervals that meet procedure requirements and industry standards represents a performance deficiency as defined in NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening." The inspectors determined that the issue was more than minor because it was associated with the facilities/equipment attribute of the Emergency Preparedness Cornerstone. The inspectors also determined that the issue potentially affected the cornerstone objective to ensure adequate protection of plant emergency workers (and consequently the health and safety of the public in the event of a radiological emergency) should SCBA bottles fail to retain air pressure when called upon for use since they had not been tested for periods well beyond the required test interval. Therefore, the issue was more than minor and represented a finding which was evaluated using the Significance Determination Process.

Since SCBA equipment is utilized to support the licensee's emergency response activities to protect emergency response workers from radiological and industrial hazards, the inspectors utilized IMC 0609, Appendix B, "Emergency Preparedness SDP," to assess the significance of the finding. The inspectors determined that the finding resulted in a failure to comply with a RP procedure which implements the licensee's Emergency Plan and was associated with one of the Planning Standards in 10 CFR 50.47(b). Further, the finding represented a degradation of the emergency worker protection portion of the Planning Standard provided in 10 CFR 50.47(b)(10) that involved more than an isolated, small percentage of the licensee's SCBA equipment. Since the finding did not represent a functional failure of the Planning Standard, the finding was determined to be of very low safety significance (Green). A Non-Cited Violation of 10 CFR 50.54(q), the planning standard of 10 CFR 50.47(b)(10) and the associated RP implementing procedure for the maintenance of SCBAs was identified. The inspectors also determined that the finding was cross-cutting in the area of Human Performance, Resources, because the principal cause of the problem was the lack of an adequate procedure and process to ensure SCBA bottles were tested at the proper frequency and tracked in the licensee's inventory before being placed in-service. Corrective actions taken by the licensee included hydrostatic testing of the affected bottles, verification that all other SCBA bottle hydrostatic tests were current, expanding SCBA bottle monthly inspection requirements, and plans to reevaluate those processes for introducing newly acquired SCBA equipment into the station inventory.

Enforcement: Title 10 CFR 50.54(q) requires, in part, that the licensee follow and maintain an Emergency Plan which meets the standards in 10 CFR 50.47(b). Title 10 CFR 50.47(b)(10) requires that the emergency response plan include a range of and means to provide protective actions for emergency workers. The licensee's Standardized Radiological Emergency Plan, EP-AA-1000 (Revision 16), Part II,

“Planning Standards and Criteria,” implements the requirements of 10 CFR 50.47(b). Part II, Section 6 of that emergency plan provides for the use of respiratory protection equipment for onsite emergency response personnel as described in RP procedures. Radiation Protection Procedure RP-QC-828 (Revision 6), “Maintenance and Inspection of the Mine Safety Appliance Self-Contained Breathing Apparatus,” requires in Section 4.8.5 that SCBA composite-type bottles be hydrostatically tested every 3 years. Contrary to these requirements, the licensee failed to ensure that SCBA bottles were tested at the required interval. Specifically, approximately 12 percent (26 bottles) of the SCBA bottles designated for emergency response use, and positioned in various areas of the plant, were not hydrostatically tested for periods ranging from 3.2 years up to nearly 7 years. Since the licensee documented this issue in its corrective action program as Issue Report 589356 and because the violation is of very low safety significance, it is being treated as a Non-Cited Violation (**NCV 05000254/2007002-02; 05000265/2007002-02**).

#### **4. OTHER ACTIVITIES**

##### 4OA1 Performance Indicator Verification (71151)

##### **Cornerstone: Initiating Events, Barrier Integrity and Emergency Preparedness**

##### .1 Reactor Safety Strategic Area

##### a. Inspection Scope

The inspectors sampled the licensee’s performance indicator submittals for the periods listed below. The inspectors used performance indicator definitions and guidance contained in Revision 4 of Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” to determine if the performance indicator data were accurate. The following performance indicators were reviewed:

- Unplanned Scrams;
- Scrams with a Loss of Heat Removal; and
- Unplanned Power Changes per 7000 Critical Hours.

The inspectors reviewed portions of the operations logs and raw performance indicator data developed from licensee event reports to determine the actual number of scrams, scrams with a loss of heat removal, and unplanned power reductions that occurred for each unit during 2006. The inspectors also used this data to calculate the actual number of critical hours for each unit. Once these calculations were complete, the inspectors compared their results to the data reported by the licensee for each performance indicator listed above.

- Reactor Coolant System Specific Activity.

The inspectors reviewed Chemistry Department records including isotopic analyses completed between October 2006 - January 2007, to determine if the greatest dose equivalent iodine values determined during steady state operations corresponded to the values reported to the NRC. The inspectors also reviewed selected dose equivalent iodine calculations including the application of dose conversion factors as specified in plant Technical Specifications. Additionally, the inspectors accompanied a chemistry technician and observed the collection and preparation of a reactor coolant system sample to evaluate compliance with the licensee's sampling procedure. Further, sample analyses and calculation methods were discussed with chemistry staff to determine their adequacy.

- Reactor Coolant System Leakage.

The inspectors reviewed the licensee's 2006 spreadsheets which tracked the measurements of drywell identified and unidentified leakage for both units. The inspectors used the information contained in the spreadsheet to calculate the daily total leakage rate for each unit and compared the total to the values provided in the Technical Specifications. The inspectors then compared the results of their calculations to the leakage data provided by the licensee during their quarterly performance indicator data submittal.

- Alert and Notification System;
- Emergency Response Organization Drill Participation; and
- Drill and Exercise Performance.

The inspectors reviewed samples of licensee records associated with the three EP performance indicators listed above. The inspectors reviewed licensee records associated with the performance indicator data reported to the NRC for the period April 2006 through December 2006. Reviewed records included: procedural guidance on assessing opportunities for these performance indicators; pre-designated Control Room Simulator training sessions, the 2006 biennial exercise, and integrated emergency response facility drills; revisions of the roster of personnel assigned to key emergency response organization positions; and results of periodic alert and notification system operability tests.

These reviews represented the completion of thirteen samples.

b. Findings

No findings of significance were identified.

## 4OA2 Identification and Resolution of Problems (71152)

### .1 Review of Items Entered into the Corrective Action Program:

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors screened all items entered into the licensee's corrective action program. This was accomplished by reviewing the description of each new issue report and attending daily management review committee meetings.

### .2 Review of Revised Standby Liquid Control Root Cause Report

#### a. Inspection Scope

As part of Inspection Report 2006016, the inspectors identified several weaknesses in the licensee's investigation of the Unit 1 standby liquid control tank leak (Root Cause Report 543422-05). The inspectors concerns were reviewed and addressed as part of Apparent Cause Report 572269-03. Additional concerns were documented in the licensee's revision to Root Cause Report 543422-05. During this period, the inspectors reviewed both reports to ensure that their concerns were properly characterized and addressed. The inspectors also reviewed the adequacy of any newly proposed corrective actions.

#### b. Findings

No findings of significance were identified. The inspectors determined that several of their concerns were addressed in Revision 1 to Root Cause Report 543422-05. However, a more meaningful apparent cause and contributing causes were identified and addressed as part of Apparent Cause Report 572269-02. This report documented that the licensee failed to previously identify and address the weaknesses identified in Inspection Report 2006016 because Quad Cities Station did not have a good understanding of the tools and processes needed to effectively identify and address organizational issues. In addition, the following contributing causes were identified:

- The licensee's standards for resolution of organizational issues do not meet industry best practices;
- The licensee was not effectively utilizing the various evaluation tools to identify and resolve organizational or programmatic issues; and
- Resolving organizational issues is not valued and reinforced as much as technical issues.

In response to these issues, the licensee planned to take the following actions:

- An independent party will provide coaching on the identification and resolution of organizational and programmatic issues to the members of the Station Ownership Committee and the Management Review Committee;

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- Root cause qualified individuals will receive training on the tools used to identify and address organizational and programmatic issues;
- A shortened training session on the tools discussed above will be provided for individuals performing apparent cause investigations; and
- The Fundamentals Management System will be reviewed once per quarter to identify any trends regarding the identification and resolution of organizational and/or programmatic issues.

The inspectors concluded that the licensee's proposed corrective actions appeared appropriate. However, additional time was needed to assess whether the licensee's actions would be effectively implemented and utilized. The inspectors planned to assess the licensee's efforts in this area as part of their routine review of plant issues.

### .3 Site Challenges Implementing Risk Management Action Tools

#### a. Inspection Scope

The inspectors performed a comprehensive review of the site's use of its risk management action (RMA) tools by verifying during maintenance that the appropriate risk assessments were conducted, the proper risk information was used, that staff members understood how to use the risk assessment tool (Paragon), and that they consistently implemented the various RMA tools. The inspectors conducted interviews, reviewed maintenance activities, requested Paragon risk assessment computer runs, and conducted numerous plant tours to verify and validate that RMA tools were implemented correctly.

#### b. Observations

As discussed in Section 1R13, "Maintenance Risk Assessments and Emergent Work Evaluation," the inspectors reviewed numerous work activities to verify that the appropriate risk assessments were performed prior to removing equipment from service. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed the inspectors verified that the plant risk was promptly re-assessed and managed. The inspectors verified that the licensee used their risk assessment tool and risk categories as directed by procedures. Based on the inspectors review, no findings of significance were identified. However, the inspectors identified the following weaknesses:

- The inspectors identified two examples where the licensee did not properly post protected equipment during maintenance activities. The inspectors identified that in one case the operating crew used an outdated operator aid to determine the required postings. In both cases, the work week management group condensed the risk engineer's protected equipment list and provided the revised list to the operating crew. This resulted in challenging the operations staff to properly post protected equipment during maintenance activities. When the inspectors identified and communicated these observations to the operations

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crew, the appropriate protected equipment was posted. In each case, the corresponding incremental core damage probability (ICDP) due to the failure to properly post the equipment did not exceed the prescribed threshold for significance (i.e., ICDP > 1E-6) as specified in Inspection Manual Chapter 0612, Appendix E.

- The inspectors identified that the operating crews inconsistently implemented RMAs. The inspectors observed that different operating crews, in particular, shift managers, would sometimes post protected equipment with signs prior to maintenance or testing. However, during similar maintenance or testing on the opposite train or unit, a different shift manager would not post the protected equipment. Although Procedure WC-AA-101, "On-Line Work Control Process," allowed protected equipment to be posted at the discretion of the shift manager, operations' use of protected equipment postings was inconsistent and could lead to future challenges. The licensee was evaluating the observation to determine how a more consistent use of RMAs would be achieved.
- The inspectors identified one example where the operating crew failed to adequately assess and monitor Unit 1 high pressure coolant injection (HPCI) room temperature during HPCI room cooler maintenance. Prior to performing the maintenance, the risk engineer determined that the HPCI system would remain available as long as the HPCI room temperature remained below 104 degrees Fahrenheit. When the cooler was removed from service, the night shift operations crew determined that the Unit 1 HPCI room temperature was below 104 degrees Fahrenheit. However, the inspectors determined that the day shift operations crew was relying on the temperature reading taken by the midnight shift to determine whether the Unit 1 HPCI system remained available. Periodic trending of the HPCI room temperature had not been considered to ensure that the Unit 1 HPCI system remained available. After discussing this issue with the inspectors, the day shift operating crew verified that room temperature had not exceed 104 degrees Fahrenheit. The day shift crew also obtained periodic HPCI room temperatures to verify that temperature did not exceed 104 degrees Fahrenheit while the room cooler maintenance was in progress.
- The inspectors identified that several of the operations staff had limited knowledge on the use of the licensee's risk assessment tool, Paragon. When requested by inspectors to demonstrate the use of Paragon, some operations staff were unable to complete the risk assessments. The operators had to rely on the risk engineer to complete the risk assessment. Although making use of the risk engineer's skill set is allowed by procedure, the inspectors identified that the operations staff's inconsistent knowledge on the use of Paragon was a weakness. This was especially true during emergent conditions when the crew could be challenged to obtain risk assessment information from the risk engineer. The licensee provided the operations staff with additional training and testing to ensure that the risk assessment tool was understood and used properly.

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- The inspectors identified a weakness regarding the operations staff's knowledge of Paragon's limitations. The inspectors requested the operations staff perform risk assessments for several actual plant conditions. When the operators attempted to perform the risk assessments, the result did not always change from the baseline core damage frequency value. The inspectors determined that in order for the operators to obtain appropriate risk assessment results, the risk engineer would have had to perform the assessment previously and stored the results in a memory bank. The operations staff was aware that they could only complete risk assessments if the same assessment had already been completed by the risk engineer and stored in a memory bank. However, the operators were surprised at the limited amount of risk assessments stored in the memory bank. The licensee was assessing the observation and evaluating the expansion of the memory bank.

Based on the inspectors review, a number of program weaknesses were identified. The licensee committed to performing immediate corrective actions for the examples identified above. The licensee planned to evaluate possible further corrective actions to prevent recurrence.

#### 4OA3 Event Followup (71153)

##### .1 Inadequate Simulation and Oversight of Training Activities Results in Trip of Control Room Ventilation Equipment

###### a. Inspection Scope

The inspectors interviewed operations personnel and reviewed associated procedures, corrective action documents, and control room logs to determine the circumstances which led to the unexpected tripping of the "A" control room ventilation air handling unit.

###### b. Findings

Introduction: The inspectors identified one Green, self-revealing finding due to the inadequate oversight and performance of training activities which led to an unexpected shut down of control room ventilation equipment.

Description: On January 1, 2007, operations shift management granted permission for an initial license training student to conduct several task performance evaluations. Each task performance evaluation required the student to perform or simulate a specific activity while in the presence of a qualified evaluator. In this case, the qualified evaluator was a non-licensed operator assigned to the operating crew.

The training student requested that he be evaluated on Task SN-5750-P13. This task required the training student to perform or simulate the actions required to manually isolate the control room ventilation system. Since there was no need for an actual isolation of this system, the trainee and the evaluator determined that the actions required to manually isolate the control room ventilation system would be simulated.

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During the training activity, the control room received alarms indicating that the “A” control room ventilation air handling unit fan had tripped and that the “B” control room ventilation system had auto started. The licensee reviewed this event and determined that the fan trip occurred due to the inappropriate installation of a relay cover during the training activity. In addition, weaknesses in the oversight and conduct of training activities contributed to this event. The weaknesses included:

- The training student inappropriately removed a relay cover as part of the simulation activities. Following this event, the student stated that he believed that removing the cover was appropriate since he had observed another training student remove the same cover previously.
- The training evaluator failed to stop the student from removing the relay cover. Once the relay cover was removed, the evaluator also failed to prevent the training student from reinstalling the relay cover. The licensee determined that neither the student nor the evaluator had discussed any expectations regarding how to properly perform the simulated activities. In addition, expectations were not set regarding the need for the training student to verbalize all actions prior to performing the simulation.
- The evaluator observed that the student days earlier had also failed to identify the removal of the relay cover as an inappropriate action. As a result, the training student believed that removing the relay cover was an expected part of the simulated activity.

Analysis: The inspectors determined that the failure to perform and provide appropriate oversight of training activities was more than minor because, if left uncorrected, it would lead to the unexpected shut down of other risk significant equipment and the performance of negative training. The inspectors assessed the significance of this finding using the Significance Determination Process and concluded that this finding was of very low safety significance because the finding did not represent a degradation of the control room radiological barrier, a degradation of the control room smoke or toxic gas barrier, or an actual open pathway in the reactor containment (**FIN 05000254/2007002-03; 05000265/2007002-03**). The inspectors determined that this finding was cross-cutting in the area of Human Performance, Work Practices, because the licensee failed to ensure that the supervisory and management oversight of work activities was appropriate to ensure that nuclear safety was supported.

Enforcement: No violation of NRC requirements were identified due to the “A” control room ventilation system being non-safety related.

.2 Lack of Preventive Maintenance Procedure Results in Time Delay Relay Failure and Unexpected Half Isolation Signal

a. Inspection Scope

The inspectors interviewed operations personnel and reviewed associated procedures, corrective action documents, and control room logs to determine the circumstances which led to a Unit 2 unexpected half containment isolation signal on January 23, 2007.

b. Findings

Introduction: A finding was self-revealed when an unexpected half containment isolation signal occurred during routine power operations due to a relay failure. The inspectors concluded that the relay failure occurred because the licensee failed to have procedures appropriate to the circumstance for replacing the main steam line low pressure time delay relays. This issue was considered to be of very low safety significance (Green) and was dispositioned as a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V.

Description: On the afternoon of January 23, Unit 2 operations personnel received an unexpected half Group 1 containment isolation signal due to a perceived main steam line low pressure condition. Operations personnel quickly verified that both reactor pressure and turbine throttle pressure were normal. However, the sequence of events recorder indicated that the time delay relay associated with the main steam line low pressure Group 1 containment isolation signal had de-energized.

The licensee conducted troubleshooting and determined that the time delay relay had experienced an internal hardware fault. A replacement relay was installed and the containment isolation system was declared fully operable approximately 12 hours later.

The licensee performed an investigation of this event and determined that these time delay relays were installed in 1991 to mitigate spurious Group 1 containment isolation signals. Following the installation, the licensee should have established and implemented procedures describing the periodic replacement of these safety-related time delay relays. However, this was never performed.

In 2002 the licensee conducted a review of relay classifications as part of a newly implemented preventive maintenance program. This review resulted in incorrectly classifying the time delay relays as "non-critical." The incorrect classification reinforced the licensee's belief that routine replacement of the time delay relays was not required. Had the relay been correctly classified, the licensee would have taken actions to ensure the time delay relays were replaced on a 10 year frequency.

In 2003 the licensee undertook efforts to identify components whose failure would significantly impact plant operations. After the list of components was identified, the licensee ensured that spare parts were available and that contingency work packages were developed. Based upon the results of this effort, the licensee identified that the main steam line low pressure time delay relays were a component whose failure would

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significantly impact plant operations. The licensee also identified that the availability of replacement time delay relays were limited as the vendor was no longer manufacturing this part. However, engineering personnel determined that finding a suitable replacement time delay relay was low priority work for the following reasons:

- Quad Cities had not experienced any problems with these relays;
- Engineering personnel believed replacing the relays would consist of a simple parts evaluation or a modification; and
- Spare relays were still available.

While this information may have been true in 2003, none of the reasons remained true in 2007. For example, when the time delay relay failure occurred Quad Cities had two replacement relays available for use. The first replacement relay failed bench testing prior to installation. As a result, the only remaining relay was successfully installed prior to returning the containment isolation logic to an operable status. At the conclusion of the inspection, no spare relays were available for use at Quad Cities or Dresden.

Analysis: The inspectors determined that the failure to have procedures appropriate to the circumstance for replacing the main steam line low pressure time delay relays was more than minor because it involved the procedure quality attribute of the Initiating Events Cornerstone and because it affected the cornerstone objective of limiting the likelihood of those events that upset plant stability during power operations. The inspectors concluded that this issue was of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors determined that the performance deficiency affected the cross-cutting area of Human Performance, Resources, in that the licensee failed to have complete, accurate and up-to-date procedures describing the periodic replacement of the time delay relay.

Enforcement: Title 10 CFR 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances. Contrary to this requirement, on January 23, 2007, Unit 2 main steam line low pressure time delay relay 2-0595-103C-1 was allowed to run to failure due to failure to establish procedures for periodically replacing this component (an activity affecting quality). Because this issue was of very low safety significance, and because the issue was entered into the licensee's corrective action program as Issue Report 582414, this violation is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of Enforcement Policy (**NCV 05000265/2007002-04**).

.3 Unit 2 Manual Reactor Scram due to Degrading Condenser Vacuum

a. Inspection Scope

The inspectors responded to the site and observed recovery actions following the initiation of a manual reactor scram on February 28, 2007. The inspectors observed the control room operators and verified that the appropriate procedures had been used

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before, during, and after the manual scram. The inspectors also observed individuals in the outage control center to ensure that personnel remained focused on nuclear safety while taking actions to determine the cause of the degrading vacuum condition.

b. Findings

No findings of significance were identified following a review of the licensee's immediate actions. However, findings may be identified and documented following the inspectors' review of the associated Licensee Event Report.

4OA5 Other Activities

.1 (Closed) Unresolved Item 05000254/2005006-01; 05000265/2005006-01: Credit for More Operators than Described by the Minimum Staffing Specified in 10 CFR 50.54(m) for Watch Standing Proficiency.

During a Licensed Operator Requalification Program inspection documented in Inspection Report 05000254/2005006; 05000265/2005006, NRC inspectors determined that credit was being given to seven control room operators at the same time to meet the requirements of 10 CFR 55.53(e) to maintain active license status. The NRC's standard for a 2-unit, single control room nuclear station was only five operators receiving credit for watchstanding. The lead inspector opened URI 05000254/2005006-01; 05000265/2005006-01, "Credit for More Operators than Described by the Minimum Staffing Specified in 10 CFR 50.54(m) for Watch Standing Proficiency," to track this possible violation of NRC requirements. Through discussions with NRC headquarters personnel it was found that a recent change in position by the NRC had been effected. The new position stated that if a nuclear station procedurally required seven control room operators to operate the plant and took the equivalent of Technical Specification action, credit could be granted for all seven positions. After a review of QAP 0300-03, Operations Shift Staffing, Revision 38, which required all seven control room watchstanders be available at shift turnover and during the shift, or the equivalent of Technical Specification action be taken, it was determined that the practice of giving concurrent credit for all seven control room watchstanding positions required by LAP 0300-03 was an acceptable practice and no violation of NRC requirements occurred.

.2 (Closed) Unresolved Item 05000254/2005007-01/05000265/2005007-01: Downgrade of Relief Valves from Category I Environmental Qualification (EQ) to Category II EQ Components

a. Inspection Scope

The inspectors reviewed the response to Task Interface Agreement (TIA) No. 2006-002, dated January 23, 2007.

b. Findings

Introduction: The inspectors identified a Green finding and a Non-Cited Violation of 10 CFR 50.49, due to the licensee replacing the Target Rock Power Operated Relief Valves (PORVs), qualified as Category I in accordance with 10 CFR 50.49, with Dresser Electromatic Relief Valves (ERVs), qualified as Category II EQ components.

Description: In 1995, the licensee replaced the Unit 2 Dresser ERVs with PORVs to address equipment reliability issues. The PORVs were classified as EQ Category I components. Due to operational performance issues, the licensee replaced the PORVs with the original Dresser ERVs during a 2004 refueling outage. The inspectors noted that the Dresser ERVs were classified as EQ Category II components per 10 CFR 50.49 and NUREG 0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electric Equipment." The licensee justified replacing the Category I PORVs with the Category II Dresser ERVs by performing a "Sound Reason to the Contrary" evaluation. As part of Engineering Change 345004, Revision 0, the licensee reasoned that "a suitable replacement design, qualified in accordance with 10 CFR 50.49, would require significant plant modifications to accommodate its use." The inspectors were concerned that there were no provisions in 10 CFR 50.49 to allow downgrading of environmental qualification even with re-installation of the original valves, and hence the "sound reasons to the contrary" portion of 10 CFR 50.49(l) did not apply. In addition, the inspectors did not believe that the licensee had provided sufficient "sound reasons to the contrary." Specifically, there was no evidence that the licensee had thoroughly evaluated the feasibility of Category 1 alternatives, including providing a sufficient technical basis to support the conclusion that significant plant modifications would be required.

A technical position was requested from the Office of Nuclear Reactor Regulation via Task Interface Agreement 2006-002 on April 10, 2006. The task interface agreement safety evaluation was issued by the Office of Nuclear Reactor Regulation on January 23, 2007, with the following position:

"The purpose of 10 CFR 50.49(l) is to provide the requirements for the replacement of Category I components and the upgrade of Category II components, not the opposite. When the final rule was issued on replacement equipment, the intent was to replace those safety-related components with enhanced qualified components to improve safety and reliability. At no point was it considered that Category II components could replace Category I components. The NRC staff believes that this action would reduce the quality of components and was never the intent of the regulation. The provision to replace the Category II components with like Category II components instead of upgrading was to allow licensees a short duration of time to deplete the existing spare supply.

It was never the intent of Regulatory Guide 1.89, "Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants," to outline sound reasons to the contrary for replacement of Category I components with non-like-for-like (e.g., Category II) components. Sound reasons to the contrary are misapplied in this

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context. Based on the above, the NRC staff finds that replacement of a Category I component with a non-like-for-like (i.e., Category II) component needs prior review and approval of the NRC before initiating such a replacement.”

Therefore, the inspectors concluded that the licensee was not in compliance with the provisions of 10 CFR 50.49 for the Unit 2 Dresser ERVs.

Analysis: The inspectors determined that the replacement of the Target Rock PORVs, EQ Category I, with Dresser ERVs, EQ Category II, was a performance deficiency warranting a significance evaluation in accordance with Appendix B, “Issue Dispositioning Screening,” of Inspection Manual Chapter (IMC) 0612, “Power Reactor Inspection Reports.” The finding was greater than minor because it was associated with the design control attribute of the Mitigating System cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, replacing an EQ Category I component with an EQ Category II component reduced the level of confidence that the component will function when called upon during accident conditions.

The inspectors evaluated the finding using the guidance in IMC 0609, Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power Situations.” The inspectors determined that this finding was of very low safety significance because it was not a design or qualification deficiency confirmed which resulted in loss of operability. Specifically, the installed Dresser ERVs were environmentally qualified for 60 years of normal service, plus accident, and 1-hour post-accident conditions for their intended safety function per NUREG 0588, Category II. Therefore, reasonable confidence remained that the valves would continue to perform their safety function under accident conditions. This finding is related to the cross-cutting element of Human Performance, Decision Making, because the licensee did not use conservative assumptions in the decision to replace EQ Category I valves with EQ Category II valves. Specifically, the licensee continued to rely on an incorrect interpretation that EQ requirements continued to be met. The decision was not conservative and did not properly weigh the importance of the safety implications of the resulting reduced level of confidence in the ability of the valves to function under accident conditions.

Enforcement: Title 10 CFR 50.49(f) requires that each item of electric equipment important to safety, covered in that section, must be qualified by one of several methods described in that section. Title 10 CFR 50.49(b) indicates that electric equipment important to safety covered by that section includes safety related electric equipment that is relied upon to remain functional during and following design basis events to ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, or the capability to prevent or mitigate the consequences of accidents that could result in offsite exposures comparable to the guidelines in several referenced sections of this chapter. Title 10 CFR 50.49(l) requires that replacement equipment must be qualified in accordance with the provisions of that section unless there are sound reasons to the

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contrary. Contrary to the above, in 2004, the licensee replaced the Unit 2 Target Rock PORVs with Dresser ERVs, that were not properly qualified in accordance with one of the methods described in 10 CFR 50.49. The sound reasons to the contrary provision was not applicable for downgrading the components from EQ Category I to Category II. Because of the very low safety significance of this finding, and because the issue was entered into the corrective action program as Issue Report 585382), it is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 0500265/2007002-05)**.

#### 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 April 3, 2007. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

##### .2 Interim Exit Meetings

Interim exit meetings were conducted for:

- Licensed Operator Requalification Program Unresolved Item Inspection with Mr. D. Snook, Licensed Operator Requalification Training Lead, Quad Cities Nuclear Power Station, February 5, 2007, via telephone.
- Emergency Preparedness inspection with Mr. B. Svaleson February 16, 2007.
- Occupational radiation safety cornerstone radiation monitoring instrumentation and protective equipment with Mr. T. Tulon and other licensee staff by telephone on February 22, 2007.
- Resolution of Unresolved Item 05000254/2005007-01; 05000265/2005007-01 with Mr. Randy Gideon and other members of licensee management on March 14, 2007.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee personnel

T. Tulon, Site Vice President  
R. Gideon, Plant Manager  
B. Adams, Engineering Manager  
R. Armitage, Training Manager  
D. Barker, Work Control Manager  
W. Beck, Regulatory Assurance Manager  
D. Craddick, Maintenance Manager  
D. Harmon, System Engineer  
D. Moore, Nuclear Oversight Manager  
V. Neels, Chemistry/Environ/Radwaste Manager  
K. Ohr, Radiation Protection Manager  
G. Powell, Radiation Protection Technical Support Supervisor  
D. Snook, Licensed Operator Requalification Training Lead  
P. Sunderland, Emergency Preparedness Coordinator  
R. Svaeson, Operations Manager  
C. Tzomes, Emergency Preparedness Manager

#### Nuclear Regulatory Commission personnel

M. Ring, Chief, Reactor Projects Branch 1  
J. Williams, NRR Project Manager

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

#### Opened

05000254/2007002-01	URI	Failure to Comply with Reactor Building Crane Utilization Procedure Involving Radiation Monitor Alarm Response during Work on the Refuel Floor
05000265/2007002-01		
05000254/2007002-02	NCV	Failure to Complete Hydrostatic Tests on all SCBA Air Bottles at Procedural Required Intervals
05000265/2007002-02		
05000254/2007002-03	FIN	Inadequate Oversight and Performance of Training Results in Tripping an Operating Control Room Fan
05000265/2007002-03		

05000265/2007002-04	NCV	Failure to have Procedures Appropriate to the Circumstance for Replacing the Main Steam Line Low Pressure Time Delay Relay
05000265/2007002-05	NCV	Replacing Unit 2 PORVs with ERVs Not In Accordance with 10 CFR 50.49
<u>Closed</u>		
05000254/2007002-02 05000265/2007002-02	NCV	Failure to Complete Hydrostatic Tests on all SCBA Air Bottles at Procedural Required Intervals
05000254/2007002-03 05000265/2007002-03	FIN	Inadequate Oversight and Performance of Training Results in Tripping an Operating Control Room Fan
05000265/2007002-04	NCV	Failure to have Procedures Appropriate to the Circumstance for Replacing the Main Steam Line Low Pressure Time Delay Relay
05000254/2005006-01 05000265/2005006-01	URI	Credit for More Operators than Described by the Minimum Staffing Specified in 10 CFR 50.54(m) for Watch Standing Proficiency
05000265/2007002-05	NCV	Replacing Unit 2 PORVs with ERVs Not In Accordance with 10 CFR 50.49
05000254/2005007-01 05000265/2005007-01	URI	Downgrade of Relief Valves from Category I Environmental Qualification (EQ) to Category II EQ Components

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.

### 1R04 Equipment Alignment

QCOP 1400-01; Core Spray System Preparation for Standby Operation; Revision 18  
Piping and Instrumentation Drawing M-36; Diagram of Core Spray Piping  
Work Order 960176; 1B Core Spray Pump Suction Valve Tripped; dated October 2, 2006  
Work Order 744589; MOV 1-1402-24B Lugs on Control Wiring Need to be Replaced; dated September 29, 2006  
Work Order 740821; Found Incorrect Lugs on Control Wiring; dated September 29, 2006  
Issue Report 200917; 1B Residual Heat Removal Service Water Pipe Hanger Frozen; dated February 11, 2004  
Problem Identification Form Q2001-03143; NOS Identified Corroded Pipe Support; dated October 9, 2001  
Issue Report 589098; Residual Heat Removal Service Water Spring Can Work Order Open for Extended Time; dated February 8, 2007  
List of Recoded Support Activity Work Orders; no date  
QOM 1-1000-04; Unit 1 Residual Heat Removal Valve Checklist; Revision 11  
QCOP 1000-02; Residual Heat Removal System Preparation for Standby Operation; Revision 23  
Quad Cites Quality Assurance Topical Report; Revision 77  
Issue Report 596345; Interim Storage and Transmittal Timeliness of Work Orders; dated February 26, 2007  
RM-AA-101; Records Management Program; Revision 7  
RM-AA-101-1008; Processing and Storage of Records; Revision 2  
QOM 2-6600-01; Unit 2 Diesel Generator Valve Checklist; Revision 19  
QCOP 6600-01; Diesel Generator (Unit 2) Preparation for Standby Operation; Revision 32  
QCOP 1300-01; Reactor Core Isolation Cooling System Preparation for Standby Operation; Revision 28  
Issue Report 555810; Circuit Breakers Do Not Coordinate in STD Range, dated 11/9/2006  
Issue Report 493816; 1C RHRSW Pump Breaker Tripped Free due to Mechanical trip from Contact Between Internal Levers, dated 5/25/2006  
Issue Report 510523; Breaker Installed During Q2R18 Incorrectly, dated 3/22/2007  
Issue Report 501887; 4KV Breaker 256 Installed at Bus 24-1 with Possible Deficiency, dated 6/20/2006  
QCEPM 0200-55; Replacement of Breakers in Seismic Qualified 125 VDC Distribution Panels; Revision 1  
Engineering Change 353965; Seismic Evaluation of DC Distribution Panels with Breaker Cubicle Door Open; approved 2/22/2005  
Engineering Change 361646; Seismic Evaluation of HFD Breaker Mounting in DC Distribution Panels and Broken Panel Cover Bolts; approved 7/20/2006

Attachment

Engineering Change 361853; Seismic Assessment of DC Distribution Panels with Missing Breaker Covers for Past functionality; approved 8/2/2006  
Engineering Change 3624925; Seismic Evaluation of DC Distribution Panel Upper Compartment with Missing Mounting Screws on Breaker Electrical Connection; approved 9/13/2006

#### 1R05 Fire Protection

Quad Cities Station Pre-Fire Plans  
Quad Cities Station Fire Hazards Analysis Report

#### 1R07 Heat Sink Performance

Heat Exchanger Inspection Report for the Unit 1 High Pressure Coolant Injection Room Cooler; dated January 17, 2007  
Nuclear Design Information Transmittal QCD-99-057; Cooling Water Flow Versus Room Cooler Heat Removal Capability for ECCS Room Coolers; dated June 3, 1999  
QCTP 0820-10; Heat Exchanger and Room Cooler Inspection; Revision 4  
QCMPM 5700-01; Emergency Air Handling Unit Maintenance and Inspection; Revision 19  
ER-AA-340-1002; Service Water Heat Exchanger and Component Inspection Guide; Revision 3  
Issue Report 581754; Clarification of Heat Exchanger TR&M ER-AA-340-1002 Needed; dated January 22, 2007

#### 1R12 Maintenance Effectiveness

Information Provided in the Quad Cities Enterprise Maintenance Rule Database  
Action Tracking Item 365492-03; (a)(1) Action Plan for the Control Room Ventilation System; dated August 1, 2005  
Issue Report 356372; Performance Criteria Exceeded for Train A Control Room Heating, Ventilation and Air Conditioning; dated July 14, 2005  
Issue Report 475132; Train A Control Room Heating, Ventilation and Air Conditioning Maintenance Rule (a)(1) Action Plan Will Not Complete by May 15; dated April 5, 2006  
Dresden System Z78 Equipment Failure Report for January 2005 to January 2007  
System Z78; 480VAC MCC Performance Detail Evaluation for 2005/6 dated 1/17/2007  
Issue Report 325658; Functional Failure Cause Determination Evaluation, dated 2/6/2007  
Issue Report 315888; Functional Failure Cause Determination Evaluation, dated 2/9/2007  
Issue Report 555863; Spare MCC Aux Contacts Identified with White Residue, dated 11/9/2006  
Issue Report 425850; MCC 15-3 A1 Tripped Repeatedly during QCOS 3300-02-CCST Heaters, dated 11/19/2005  
Issue Report 595344; Potential MRFF's for 480 V MCC from CCST/CST Htr Bkr Trips, dated 2/23/2007

#### 1R13 Risk Assessment and Emergent Work

Work Week Safety Profiles  
Daily Work Schedules  
Control Room Operating Logs

## 1R15 Operability Evaluations

Issue Report 590632; Front End Management Review Committee Follow-up to Shift Button Does Not Work; dated February 12, 2007  
Issue Report 569515; Flow Control Valve ½-5741-333 Failed Closed; dated December 14, 2006  
Issue Report 582509; Relay Failure During Post Maintenance Testing; dated January 24, 2007  
Issue Report 583809; QCOS 5750-11 Acceptance Criteria Not Met; dated January 26, 2007  
General Electric Letter 1D4JY-93-001; High Pressure Coolant Injection and Reactor Core Isolation Cooling Observations and Recommendations; dated July 22, 1993  
QCOS 2300-23; High Pressure Coolant Injection Motor Speed Changer Timing Test; Revision 5  
Engineering Change 364878; Retract NRC Reportability Notification Unit 2 High Pressure Coolant Injection Motor Speed Changer Degradation  
Apparent Cause Report 582509; Relay 0-9400-105 CR5ISO Failure During Post-Maintenance Testing due to Excessive Mechanical and Frictional Forces Present in the Relay; dated March 7, 2007  
Engineering Change 336358; Procedurally Controlled Temporary Configuration Change for Control Room Emergency Ventilation System CR5 Relay Replacement; Revision 0  
Retraction of Event Notification for Unit 2 High Pressure Coolant Injection Motor Speed Changer Degradation; dated March 5, 2007  
Historical 1C and 1D Residual Heat Removal Service Water Pump Performance Data; dated March 2, 2007  
Issue Report 597959; QCOS 1000-04 Residual Heat Removal Service Water Pump Operability Test Results Unsat; dated March 1, 2007  
Issue Report 580419; Gap Below Residual Heat Removal Service Water Separation Screen; dated January 18, 2007  
Issue Report 585382; NRC Identified Concern with Environmental Qualifications for Unit 2 Electromatic Relief Valve Actuator; dated January 30, 2007  
Engineering Change 359513; Electromatic Relief Valve Actuator Replacement; Revision 0

## 1R17 Permanent Plant Modifications

Engineering Change 333305; Replace Coupling and Support of the Status Water Cooling Pump Motor; Revision 0  
Work Order 802878; Modify the Stator Water Cooling Pump in Accordance with Engineering Change 333305  
Issue Report 585978; Delay in Final Clearing the 1B Stator Water Pump; dated January 31, 2007  
Issue Report 585589; Conductor Insulation Damage Found in Work Order 802877; dated January 29, 2007  
Issue Report 583460; Engineering Change 333305 Revision Due to Changes Made to Revision 0; dated January 25, 2007  
Issue Report 590442; Elevated Vibration Readings on 1B Stator Water Pump; dated February 12, 2007  
Vibration Trend Results on Stator Water Cooling Pump Motors; dated February 2, 2007

### 1R19 Post Maintenance Testing

Work Order 802878; Modify the 2-7401A Stator Water Cooling Pump in Accordance with Engineering Change 333305; no date listed  
Work Order 683875; Replay Control Room Heating, Ventilation and Air Conditioning Relay 0-9400-105-CR5ISO; dated January 20, 2007  
Engineering Change 336358; Procedurally Controlled Temporary Configuration Change for Control Room Emergency Ventilation System CR5 Relay Replacement; Revision 0  
Issue Report 582509; Control Room Heating, Ventilation and Air Conditioning TIC 1666 Unexpected Results; dated January 24, 2007  
Issue Report 582686; Work Order 683686 Not Bundled with Other B Control Room Heating, Ventilation and Air Conditioning Work; dated January 24, 2007  
Nuclear Event Report BY-06-013; Shutdown and Control Bank Fail to Withdraw During Refueling Outage Testing; dated February 13, 2006  
Nuclear Event Report QC-06-018; Failure of Control Room Emergency Ventilation Air Conditioning Compressor due to Electrical Relay; dated February 15, 2006  
General Electric Letter 1D4JY-93-001; High Pressure Coolant Injection and Reactor Core Isolation Cooling Observations and Recommendations; dated July 22, 1993  
QCOS 2300-23; High Pressure Coolant Injection Motor Speed Changer Timing Test; Revision 5  
Engineering Change 364878; Retract NRC Reportability Notification Unit 2 High Pressure Coolant Injection Motor Speed Changer Degradation  
Issue Report 600638; Failure of Relay 10A-K48B During QCOS 1000-33; dated March 7, 2007  
50.59 Screening QC-S-2007-0042; Replace Residual Heat Removal Injection Valve Interlock Timer; dated March 7, 2007  
Engineering Change 364951; Replace Residual Heat Removal Injection Valve 1-1001-28B Open Interlock Timer; Revision 1  
Complex Troubleshooter for Work Order 971905; dated March 10, 2007

### 1R20 Refueling and Outage Activities

Issue Report 598382; 2C Reactor Feedwater Pump Emergent Repairs Requires Clearance Order; dated March 2, 2007  
Issue Report 597884; Post Maintenance Test for Offgas Repair Identified More Steam Leaks; dated March 1, 2007  
Control Room Operating Logs; dated February 27 and 28, 2007  
Issue Report 597007; After Unit 2 Scram Did Not Receive 902-6 D12 Alarm as Expected; dated February 28, 2007  
Issue Report 597005; After Unit 2 Scram Did Not Receive 902-6 B12 As Expected; dated February 28, 2007  
Issue Report 597002; Unit 2 Manually Scrammed due to Decreasing Condenser Vacuum; dated February 28, 2007  
Issue Report 597001; Manual Reactor Scram due to a Loss of Main Condenser Vacuum; dated February 28, 2007

## 1R22 Surveillance Testing

Issue Report 579681; QCOS 7500-05 Secured Early; dated January 16, 2007  
Quick Human Performance  
Issue Report 590578; Procedure Enhancement; dated February 12, 2007  
Issue Report 590891; High Pressure Coolant Injection Turning Gear; dated February 12, 2007  
Issue Report 590639; High Pressure Coolant Injection Aux Oil Pump Discrepancy; dated February 12, 2007  
Issue Report 590340; Incorrect IST Acceptance Criteria Used During IST Test; dated February 12, 2007  
Issue Report 600367; Reactor Core Isolation Cooling 2-1301-48 Valve Timing in Alert Range; dated March 7, 2007  
Issue Report 577218; ½ EDG Crankcase Vacuum High; dated January 10, 2007  
Issue Report 578248; ½ EDG High Crankcase Pressure; dated January 11, 2007  
Issue Report 589290; NRC Identified a Concern with Merging of QCOS 5750-11 Data; dated February 8, 2007  
QCOS 5750-11; Control Room Emergency Ventilation System Test; Revisions 21 and 22

## 1R23 Temporary Plant Modifications

Issue Report 289214; Flow Control Valve 333 is not Properly Controlling Discharge Pressure; dated January 10, 2005  
Issue Report 390980; B Control Room Ventilation Flow Control Valve 0-5741-333 Not Responding Correctly; dated October 27, 2005  
Issue Report 569515; Flow Control Valve ½-5741-333 Failed Closed; dated December 14, 2006  
QCOP 5750-09; Control Room Ventilation System; Revision 40  
QCAP 0308-01; Guidelines for Installation of Test Recorders and Data Acquisition Systems on Plant Equipment; Revision 2  
Updated Final Safety Analysis Report Section 9.4; Air Conditioning, Heat, Cooling, and Ventilation Systems; Revision 6  
Updated Final Safety Analysis Report Section 6.4; Habitability Systems; Revision 2  
CC-AA-112; Temporary Configuration Changes; Revision 11

## 1EP2 Alert and Notification System (ANS) Evaluation

Quad Cities Plant Warning System Maintenance and Operational Report for August 28, 2006 Through November 11, 2006; dated December 15, 2006  
Quad Cities Plant Warning System Maintenance and Operational Report for October 26, 2005 Through December 15, 2005; dated December 20, 2005  
Quad Cities Monthly Siren Availability Reports for January 2006 through December 2006  
Quad Cities Monthly Siren Availability Reports for January 2005 through December 2005  
Quad Cities Siren Daily Operability Reports for 2006; dated January 2006 through December 2006  
Quad Cities Siren Daily Operability Reports for 2006; dated January 2005 through December 2005  
Exelon Semi-Annual Siren Report for January 1, 2006 to June 30, 2006

Issue Report 517283; Quad Cities Alert Notification System Reached 25 Percent Outage; dated August 6, 2006

1EP3 Emergency Response Organization Staffing and Augmentation System

EP-AA-1000, Part II, Sections B and E; Minimum Staffing Requirements for the Exelon ERO and Notification Methods and Criteria; Revision 17  
EP-AA-112-100-F-06; Midwest ERO Notification or Augmentation; Revision G  
EP-AA-122-1001; Drill and Exercise Scheduling, Development and Conduct; Revision 6  
TQ-AA-113; ERO Training and Qualification; Revision 8  
Quad Cities Augmentation Drill Evaluation Reports; dated February 2005 through January 2007  
Quad Cities Station Emergency Response Organization List; dated February 5, 2007  
Issue Report 532671; EP Augmentation Drill Issues - Off-Hours Call-In Drill; dated September 18, 2006  
Issue Report 517235; EP Call-In Drill Issues from the July 24, 2006 Drill; dated August 6, 2006  
Issue Report 509565; EP Call-In Drill Issues; dated July 14, 2006  
Issue Report 473339; EP March Augmentation Drill Marginal Pass; dated March 22, 2006  
Issue Report 399061; EP Drive-In Drill Failure; dated November 14, 2005

1EP5 Correction of Emergency Preparedness Weaknesses

EP-AA-122-101; Drill and Exercise Scheduling, Development and Conduct; Revision 6  
NOSA-QDC-06-03; Quad Cities Station Emergency Preparedness Audit Report; dated April 12, 2006  
NOSA-QDC-050-04; Quad Cities Station Emergency Preparedness, 50.54(q) Audit Report; dated May 4, 2005  
NO-AA-1024; Attachment 1; NOS Objective Evidence Report; Revision 1  
Quad Cities Station 2007 NRC Baseline Program Inspection Readiness Assessment; dated January 26, 2007  
Check-In Self-Assessment AT No. 461663; EP Drill and Exercise Tracking and Scheduling; dated May 19, 2006  
Check-In Self-Assessment AT No. 461669; Corrective Action Program (CAP) Utilization; dated April 10, 2006  
Assessment AT No. 469610; Readiness Assessment of Emergency Preparedness Program Areas Evaluated by The NRC during The Week of The Graded Exercise; dated May 3, 2006  
Quad Cities 2006 NRC Graded Exercise Findings and Observation Report; dated June 15, 2006  
Quad Cities 2005 Off Year Exercise Findings and Observation Report; dated November 18, 2005

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

QIP 1800-01; Area Radiation Monitor Calibration; Revision 11  
RP-QC-731; Eberline PM-7 Portal Monitor; Revision 4  
RP-QC-729; Operation and Calibration of the IPM Whole Body Monitors; Revision 2  
Calibration Data for Unit-1 Offgas Charcoal Bed Vault ARM; dated July 7, 2006  
Calibration Data for Unit-1 TIP Room ARM; dated August 30, 2006

Calibration Data for Unit-2 HPCI Room ARM; dated July 21, 2006  
 Calibration Data for Unit-1 and Unit-2 Reactor Building Vent Radiation Monitors; dated December 13, 2006 (Unit 1), and dated December 14, 2006 (Unit 2)  
 Calibration Report for Canberra Fastscan Whole Body Count System; dated March 27, 2006  
 Calibration Data for Drywell (High Range) Radiation Monitors; Unit 1 Division I (dated March 8 and April 9, 2005); Unit 2 Division I (dated February 28, 2006); Unit 2 Division II (dated March 1, 2006)  
 RP-AA-700; Controls for Radiation Protection Instrumentation; Revision 1  
 Output Verification Data for J. L. Shepherd Model 89-400 Instrument Calibrator; dated December 1, 2006  
 Radcal Corporation Report of Calibration for Model 20X5-3 (Serial # 4937) and Model 20X5-180 (Serial # 6917) Ion Chambers; dated October 17, 2006  
 Certificate of Calibration for MGP Model AMP-100 (Serial # 5002-073); dated May 2, 2006  
 Calibration Data for Model PM-7 Portal Monitors (serial #s PM-1, PM-2, PM-3, PM-6, PM-15, PM-10, PM-11); dated between November 27, 2006 and January 4, 2007  
 Calibration Records for IPM-8 Personnel Contamination Monitors (Serial #s 342, 343, 347, 348, 349, 350, 351, and 353); dated between December 12, 2006 and January 21, 2007  
 RP-AA-222; Methods for Estimating Internal Exposure From In-Vivo and In-Vitro Bioassay Data; Revision 2  
 Issue Report 00584636 and Associated Quick Human Performance Investigation Report; ARM Audible Alarm Disconnected by Crane Operator; dated January 29, 2007  
 QCMM 5800-05; Reactor Building Overhead Crane Utilization; Revision 18  
 RWP 10007921; Fuel Handling - General Tasks/Pool Work; Revision 0  
 RP-QC-828; Maintenance and Inspection of the MSA Self-Contained Breathing Apparatus; Revision 6  
 SCBA Monthly Inspection Sheets for January 2006 - January 2007  
 SCBA Air Bottle Hydrostatic Test Inspection Sheets; various dates in 2006  
 SCBA Post Use/Post Maintenance Inspection Sheets; various dates in 2006  
 Respiratory Protection Qualification and Training Data for Chemistry, Radiation Protection, Operations and Maintenance (Instrument, Mechanical and Electrical) Departments; dated February 8, 2007  
 Mine Safety Appliance Training Certificates for Specified Quad Cities Staff; dated January 19, 2006  
 Respiratory Level II Lesson Plan; MSA 2216 SCBA Use; Revision 6  
 QCHRSS 0400-01; Unit 1 and Unit 2 Reactor Water Recirc Undiluted Sample Surveillance Data; dated various periods in 2005 and 2006  
 CY-QC-110-678; Unit 1 and Unit 2 Containment Air Sampling Surveillance Data; dated various periods in 2005 and 2006  
 QCHRSS 0400-05; Unit 1 and Unit 2 Torus Sample Surveillance Data; dated various periods in 2005 and 2006  
 Issue Report 00379214; SCBA Regulators Failed to Work as Designed; dated September 28, 2005  
 Issue Report 00346044; SCBA Trouble (Regulator or Mask Valve); dated June 21, 2005  
 Issue Report 00343498; SCBA Pass Device Alarms Sound too Soon; dated June 13, 2005  
 Self-Assessment Reports; Radiation Protection Instrumentation; dated June 28, 2005, and January 10, 2007  
 Audit Report NOS Audit NOSA-QDC-05-06; Health Physics; dated July 27, 2005

Certificate of Calibration for Eberline Model ASP-1/NRD (Serial # 3471/NB003); dated March 29, 2006  
Certificate of Calibration for Thermo-Electron Model ESM-FH-40 (Serial # 017902); dated June 19, 2006  
Flow and Source Calibration Data Records; Drywell Continuous Air Monitor (Serial # 83-122-20); dated October 27, 2006

#### 4OA1 Performance Indicator Verification

QCCP 0200-01; Reactor Water Iodine Analysis; Revision 14  
CY-QC-110-608; Reactor/Turbine Building Sample Panel Sample Collection; Revision 8  
Gamma Isotopic Reports and Dose Equivalent  
LS-AA-2110; Monthly PI Data Elements for ERO Drill Participation; dated April 2006 through December 2006  
LS-AA-2120; Monthly Data Elements for NRC Drill/Exercise Performance; dated April 2006 through December 2006  
LS-AA-2130; Monthly Data Elements for NRC Alert and Notification System (ANS) Reliability; dated April 2006 through December 2006  
EP-AA-1000; Part II, Section E; Exelon Nuclear Standardized Radiological Emergency Plan, Notification Methods and Procedures; Revision 17  
EP-AA-1006; Exelon Nuclear Radiological Emergency Plan Annex for Quad Cities Station; Revision 23  
EP-AA-111; Emergency Classification and Protective Action Recommendations; Revision 11  
EP-AA-125-1002; Attachment 1; R.EP. and EPPI.01a-c PI Summary for April 2006 through December 2006  
EP-AA-125-1003; Key ERO Participation (R.EP.02) and Stability (EPPI.026) Monthly Data Reporting Elements from April 2006 through December 2006  
NRC Performance Indicator Monthly Data Summary and Documents for April 2006 through December 2006  
Memorandum from C. A. "Pete" Tzomes; Scheduling of Drills and Exercise Performance (DEP) Opportunities - 2006 (Revised); dated October 23, 2006  
Issue Report 516942; EP Drills and Exercise Performance (DEP); dated August 28, 2006

#### 4OA2 Problem Identification and Resolution

Issue Report 585924; Additional Actions Required for Online Risk Management; dated January 31, 2007  
Work Week Safety Profile; February 5-11, 2007  
Work Week Risk Review; February 5-11, 2007  
WC-AA-101; Online Work Control Process; Revision 13  
ER-AA-600-1012; Risk Management Documentation; Revision 6  
ER-AA-600-1014; Risk Management Configuration Control; Revision 4  
ER-AA-600-1011; Risk Management Program; Revision 4  
ER-AA-600-1042; On-Line Risk Management; Revision 4  
ER-AA-600; Risk Management; Revision 5  
ER-AA-600-1016; ORAM-Sentinel and Paragon Tool Update; Revision 5  
ER-AA-600-1021; Risk Management Application Methodologies; Revision 4

#### 4OA3 Event Followup

Issue Report 574227; A Control Room Heating, Ventilation and Air Conditioning Air Handling Unit Fan Tripped; dated January 1, 2007

Quick Human Performance Investigation Report 574227; A Control Room Heating, Ventilation and Air Conditioning Air Handling Unit Fan Tripped; dated January 18, 2007

TQ-AA-203; On the Job Training and Task Performance Evaluation; Revision 1

QCOS 5750-03; Manual Isolation of Control Room Ventilation; Revision 12

Issue Report 589050; Spare PCI Relay Unavailable; dated February 8, 2007

#### 4OA5 Other

Final Response to Quad Cities Nuclear Power Station- Task Interface Agreement (TIA) 2006-002, from M. J. Case to C. D. Pederson; dated January 23, 2007

Request for Technical Assistance (TIA 2006-002) from C. D. Pederson to E Hackett; dated April 10, 2006

Issue Report 585382; NRC Identified Concern with EQ Unit 2 ERV Actuator; dated January 1, 2007

## LIST OF ACRONYMS USED

ANS	Alert and Notification System
ARM	Area Radiation Monitor
CREVS	Control Room Emergency Ventilation System
dc	direct current
EP	Emergency Preparedness
EPZ	Emergency Planning Zone
EQ	Environmentally Qualified
ERO	Emergency Response Organization
ERV	Electromatic Relief Valve
HPCI	High Pressure Coolant Injection
ICDP	Incremental Core Damage Probability
IMC	Inspection Manual Chapter
NCV	Non-Cited Violation
NOS	Nuclear Oversight Department
PI	Performance Indicator
PORV	Power Operated Relief Valve
RCA	Radiologically Controlled Area
RMAs	Risk Management Actions
RP	Radiation Protection
SCBA	Self-Contained Breathing Apparatus
scfm	standard cubic feet per minute
VAC	Volts-Alternating Current
VDC	Volts-Direct Current