January 30, 2008

EA 07-248

Mr. Charles G. Pardee
Chief Nuclear Officer and
Senior Vice President
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000254/2007005;
05000265/2007005 AND 07200053/2007001

Dear Mr. Pardee:

On December 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 January 8, 2008, with Mr. R. Gideon 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, two findings of very low safety significance (Green) were identified. These issues also involved violations of NRC requirements. However, because these violations were of very low safety significance and because the issues were entered into your corrective action program, the NRC is treating these findings as Non-Cited Violations in accordance with Section V1.A.1 of the NRC's Enforcement Policy. In addition, the results of a recent Office of Investigations investigation identified a willful violation of a station procedure. However, because the violation had no actual radiological significance and minimal potential radiological significance, the violation was licensee-identified, involved the acts of a low-level individual resulting from an isolated action without management involvement, and because adequate remedial action was taken, the NRC is also treating this issue as a Non-Cited Violation, in accordance with Sections IV.A. and VI.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 Regulatory 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 made 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), 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 05000254/2007005; 05000265/2007005 and 07200053/2007001 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 and Senior Vice President
Senior Vice President - Midwest Operations
Senior Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director Licensing - Licensing and Regulatory Affairs
Manager Licensing - Clinton, Dresden and Quad Cities
Associate General Counsel
Document Control Desk – Licensing
Assistant Attorney General
State Liaison Officer, State of Illinois
State Liaison Officer, State of Iowa
Chairman, Illinois Commerce Commission
Illinois Emergency Management Agency
Vice President - Law and Regulatory Affairs
Chief Radiological Emergency Preparedness Section,
Dept. Of Homeland Security
D. Tubbs, Manager of Nuclear

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Mark A. Ring, Chief
Branch 1
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Letter to C. Pardee from M. Ring dated January 30, 2008

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000254/2007005;
05000265/2007005 AND 07200053/2007001

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254, 50-265, 72-053
License Nos:	DPR-29, DPR-30
Report No:	05000254/2007005; 05000265/2007005 and 07200053/2007001
Licensee:	Exelon Nuclear
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	Cordova, Illinois
Dates:	October 1, 2007, through December 31, 2007
Inspectors:	K. Stoedter, Senior Resident Inspector G. Kolcum, Acting Resident Inspector R. Jones, Acting Resident Inspector S. Bakhsh, Dry Cask Storage Inspector A. Barker, Project Engineer T. Bilik, Reactor Engineer R. Jickling, Senior Emergency Preparedness Inspector A. Koonce, Reactor Engineer J. McGhee, Reactor Engineer R. Orlikowski, Senior Resident Inspector – Duane Arnold B. Palagi, Senior Operations Engineer W. Slawinski, Senior Radiation Protection Inspector C. Zoia, Senior Operations Engineer
Approved by:	M. Ring, Chief Branch 1 Division of Reactor Projects

Enclosure

TABLE OF CONTENTS

SUMMARY OF FINDINGS

IR 05000254/2007005, 05000265/2007005, 07200053/2007001; 10/01/07 – 12/31/07; Quad Station, Units 1 & 2; Other Activities.

This report covers a three-month period of inspection by resident inspectors, announced baseline inspections by regional inspectors and an Independent Spent Fuel Storage Installation inspection. Two Green findings were identified. These findings were considered Non-Cited Violations of NRC regulations. 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 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding of very low safety significance and a Non-Cited Violation of Technical Specification 5.4.1 occurred on November 10, 2006, due to the failure to establish, implement, and maintain procedures associated with the fire protection program. The failure to implement and maintain these procedures resulted in a fire protection system hydraulic transient and the wetting of an electrical bus which powered risk-significant equipment. Corrective actions for this issue included providing improved procedural instructions regarding fire pump relief valve setpoint verifications, fire protection system strainer maintenance, and fire hydrant flushing activities.

  This issue was more than minor because the procedural deficiencies were a precursor to a switchgear wetting event which could have resulted in the tripping of risk-significant equipment and a reactor scram. This finding was determined to be of very low safety significance because had the risk-significant mitigating systems equipment tripped, the remaining mitigating systems would have been sufficient to address a transient with a loss of the power conversion system and the failure of all containment heat removal. The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Resources, Documentation, because the licensee failed to have complete, accurate and up-to-date procedures governing fire pump relief valve setpoint verifications, fire protection system strainer maintenance, and fire hydrant flushing activities. (Section 4OA5.4)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance and a Non-Cited Violation of Technical Specification 5.4.1 due to the failure to develop adequate surveillance testing and operating procedures for equipment used during an external flooding event. Corrective actions for this issue included revising the current external flooding procedure and developing and implementing a procedure to test a portable pump used as the sole source of makeup water to the spent fuel pool following an external flood.

This issue was more than minor because it involved the equipment performance and procedure quality attributes of the Mitigating Systems Cornerstone and affected the objective of ensuring the reliability and capability of systems that respond to Initiating Events to prevent undesirable consequences. This issue was determined to be of very low safety significance due to the very low probability of an external flood of the magnitude which required use of the portable pump and the amount of additional time available to implement other compensatory measures if needed. The inspectors concluded that this finding was cross-cutting in the area of Human Performance, Resources, Documentation, because the licensee failed to have complete, accurate and up-to-date procedures to combat an external flooding event. (Section 4OA5.5)

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, was reviewed by the inspectors. In addition, a violation of very low safety significance, which was identified by the licensee and was the subject of an investigation by the NRC Office of Investigation, was reviewed. Corrective actions taken or planned by the licensee have been entered into the corrective action program. The first licensee identified violation and corrective actions are provided in Section 4OA7 of this report. Details regarding the violation and corrective actions subject to the investigation conducted by the Office of Investigation are provided in Sections 4OA5 and 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1

12/14 Unit 1 reduced power to 750 megawatts electric (MWe) to complete turbine valve testing. Power was restored to normal levels approximately five hours later.

Unit 2

10/15 Unit 2 reduced power to 880 MWe due to the insertion of control rod K5. This control rod was inserted to compensate for the rod worth minimizer losing indication. Power was restored later the same day.

10/22 Unit 2 reduced power to 837 MWe to recover control rod K5. Power was restored to normal levels the same day.

10/25 Unit 2 emergent down power to 785 MWe to replace the 2D condensate pump seal. This pump was taken out of service following a large increase in thrust bearing temperatures. Power was restored to normal levels on 10/26.

12/15 Unit 2 reduced power to 725 MWe to complete routine turbine valve and control rod drive testing. Power was restored to normal levels approximately six hours later.

1. REACTOR SAFETY

Initiating Events, Mitigating Systems, and Barrier Integrity [R]

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into the corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Ice Melt Valve and
- Heating Steam System.

This inspection constitutes two winter seasonal readiness preparation samples as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Unit 1 and Unit 2 Emergency Diesel Generators;
- 2B Core Spray System; and
- Unit ½ Emergency Diesel Generator.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, Administrative TS, outstanding work orders, issue reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified 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 and entered them into the corrective action program with the appropriate significance characterization.

These activities constituted three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Fire Zone 7.2 – Unit 2 250 Volt Battery Room;
- Fire Zone 8.2.1.A – Unit 1 Condensate Pump Room;
- Fire Zone 8.2.2.A – Unit 2 Control Rod Drive Pump Area;
- Fire Zone 8.2.3.A – Unit 1 Control Rod Drive Pump Area; and
- Fire Zone 11.1.2 – Unit 2 Residual Heat Removal Service Water Vaults.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the licensee's ability to respond to a fire event. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

These activities constituted five quarterly fire protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Facility Operating History

a. Inspection Scope

The inspectors reviewed the plant's operating history from November 2005 through October 2007 to identify operating experience that was expected to be addressed by the Licensed Operator Requalification Training (LORT) program. The inspectors assessed whether the identified operating experience had been addressed by the facility licensee

in accordance with the station's approved Systems Approach to Training (SAT) program to satisfy the requirements of 10 CFR 55.59(c), "Requalification Program Requirements."

b. Findings

No findings of significance were identified.

.2 Licensee Requalification Examinations

a. Inspection Scope

The inspectors performed a biennial inspection of the licensee's LORT test/examination program for compliance with the station's SAT program which would satisfy the requirements of 10 CFR 55.59(c)(4), "Evaluation." The reviewed operating examination material consisted of four operating tests, each containing two dynamic simulator scenarios and five job performance measures (JPMs). The four written examinations reviewed consisted of two parts: a 15 question Comprehensive Written Exam and a 15 question Comprehensive Static Exam. Additionally one Fuel Handling Limited Comprehensive Written Exam was reviewed. The inspectors reviewed the annual requalification operating test and biennial written examination material to evaluate general quality, construction, and difficulty level. The inspectors assessed the level of examination material duplication from week-to-week during the current year operating test and written examination. The inspectors reviewed the methodology for developing the examinations, including the LORT program two-year sample plan, probabilistic risk assessment insights, previously identified operator performance deficiencies, and plant modifications.

b. Findings

No findings of significance were identified.

.3 Licensee Administration of Requalification Examinations

a. Inspection Scope

The inspectors observed the administration of a requalification operating test to assess the licensee's effectiveness in conducting the test to ensure compliance with 10 CRF 55.59(c)(4), "Evaluation." The inspectors evaluated the performance of two crews in parallel with the facility evaluators during two dynamic simulator scenarios. The inspectors also evaluated various licensed crew members concurrently with facility evaluators during the administration of several JPMs. The inspectors assessed the facility evaluators' ability to determine adequate crew and individual performance using objective, measurable standards. The inspectors observed the training staff personnel administer the operating test and written exam, including conducting pre-examination briefings, evaluations of operator performance, proctoring of the written exam, and individual and crew evaluations upon completion of the operating test. The inspectors evaluated the ability of the simulator to support the examinations. A specific evaluation of simulator performance was conducted and documented under Section 1R11.8, "Conformance with Simulator Requirements Specified in 10 CFR 55.46," of this report.

b. Findings

No findings of significance were identified.

.4 Examination Security

a. Inspection Scope

The inspectors observed and reviewed the licensee's overall licensed operator requalification examination security program related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors also reviewed the facility licensee's examination security procedure, any corrective actions related to past or present examination security problems at the facility, and the implementation of security and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the examination process.

b. Findings

No findings of significance were identified.

.5 Licensee Training Feedback System

a. Inspection Scope

The inspectors assessed the methods and effectiveness of the licensee's processes for revising and maintaining its LORT Program up-to-date, including the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT program and their ability to implement appropriate corrective actions. This evaluation was performed to verify compliance with 10 CFR 55.59(c) "Requalification Program Requirements" and the licensee's SAT program.

b. Findings

No findings of significance were identified.

.6 Licensee Remedial Training Program

a. Inspection Scope

The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the previous biennial requalification examinations and the training from the current examination cycle to ensure that the licensee addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. This evaluation was performed in accordance with 10 CFR 55.59(c) "Requalification Program Requirements" and with respect to the licensee's SAT program.

b. Findings

No findings of significance were identified.

.7 Conformance With Operator License Conditions

a. Inspection Scope

The inspectors reviewed the facility and individual operator licensees' conformance with the requirements of 10 CFR Part 55. The inspectors reviewed the facility licensee's program for maintaining active operator licenses and assessment of compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the licensee's procedural guidance and process for tracking on-shift hours for licensed operators, and which control room positions were granted watch-standing credit for maintaining active operator licenses. The inspectors reviewed the facility licensee's LORT program to assess compliance with the requalification program requirements as described by 10 CFR 55.59(c). In addition, medical records for ten licensed operators were reviewed for compliance with 10 CFR 55.53(i).

b. Findings

No findings of significance were identified.

.8 Conformance With Simulator Requirements Specified in 10 CFR 55.46

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

.9 Annual Operating Test Results and Biennial Written Examination Results

a. Inspection Scope

The inspectors reviewed the pass/fail results of the 2007 individual biennial written examinations, and the annual operating tests (required to be given annually per 10 CFR 55.59(a)(2)) administered by the licensee during calendar year 2007. The overall written examination and operating test results were compared with the significance determination process in accordance with NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process."

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated performance issues involving the following risk-significant systems:

- Service Water – Function Z3900; and
- Transformers – Functions Z6200, 6300 and 6400.

The inspectors independently verified the licensee's actions to address system performance or problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b);
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

This inspection constitutes two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings of significance were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Work Week 41 including maintenance on the 1A control rod drive pump, the 1A service air compressor, the electrical supply between transformer 12 and bus 11; and two Unit 2 4 kilovolt breakers;
- Work associated with performing a 250 Vdc load test on both units;
- Work Week 42 including maintenance on the 1A stator water cooling pump, the ½ emergency diesel generator, bus 23-1, the 2A core spray loop, the 1B traveling screen, and the 2A1 motor generator set oil pump;
- Work Week 45 including maintenance on the 1A residual heat removal loop, the 2C circulating water pump, the 2A control rod drive pump and switchyard work;
- Work Week 50 including planned maintenance on the safe shutdown makeup pump, the reactor building ventilation system, the Unit 2 station blackout diesel generator, the 1A fuel pool cooling demineralizer and the condensate demineralizers; and
- Emergent work on the safe shutdown makeup pump which occurred on December 17, 2007.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, 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 reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift manager, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These activities constituted six samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Issue Report 367499 – Evaluate Operability of Motors Susceptible to Magnesium Rotor Degradation;
- Issue Report 653905 – 1C Residual Heat Removal Service Water Pump High Motor Bearing Temperature;
- Issue Report 664903 – Reactor Building Ventilation Isolation Damper Solenoid Degradation;
- Issue Report 665718 – Residual Heat Removal Service Water Post Accident Temperature Exceeds Piping Design;
- Issue Report 672191 – Level III 125 Volt Direct Current Ground Unit 1;
- Issue Report 674486 – Control Rod B9 Notched from 48 to 46 When Selected;
- Issue Report 675945 – Local Power Range Monitor 08-33-D Spiked High;
- Issue Report 709404 – Reactor Core Isolation Cooling Drain Line Steam Leak;
- Issue Report 707714 – Turbine First Stage Pressure Switch Issue; and
- Issue Report 705532 – Electromatic Relief Valve Solenoid Repeatability Issue.

The inspectors selected these operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

This inspection constitutes ten samples as defined in Inspection Procedure 71111.15.-05.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

.1 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- QCOS 0300-01 – Control Rod Drive Exercising following maintenance on the Unit 1 reactor manual control system timer;
- QCOS 1400-08 – Core Spray System Power Operated Valve Test following maintenance on the 1B core spray system;
- QCOS 5750-04 – Quarterly Timing of Control Room Ventilation System Valves and Dampers following the replacement of the actuator for valve 0-5741-319B;
- QCOS 6600-43 – Quarterly Diesel Generator Load Test following maintenance on the Unit ½ emergency diesel generator cooling water pump breaker;
- QCOS 6600-06 – Diesel Generator Cooling Water Pump Flow Rate Test following replacement of the Unit 2 emergency diesel generator cooling water pump; and
- QCOS 2900-01 (TIC-1968) – Safe Shutdown Makeup Pump Flow Rate Test following maintenance on the safe shutdown makeup system.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed, testing was adequate for the maintenance performed, acceptance criteria were clear and demonstrated operational readiness, test instrumentation was appropriate, tests were performed as written in accordance with properly reviewed and approved procedures, equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion), and test documentation was properly evaluated. The inspectors evaluated the activities against the TS, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety.

This inspection constitutes six samples as defined in Inspection Procedure 71111.19.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activity to determine whether risk-significant equipment was capable of performing its intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- QCOS 0300-01 – Control Rod Drive Exercising.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; and the calibration frequencies were in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program.

This inspection constitutes one routine surveillance testing sample as defined in Inspection Procedure 71111.22.

b. Findings

No findings of significance were identified.

.2 In-service Testing

a. Inspection Scope

The inspectors reviewed the results for the following activity to determine whether the equipment was capable of performing its intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- QCOS 6600-02 – Diesel Generator Air Compressor Operability.

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; and the calibration frequencies were in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers (ASME) Code, and reference values were consistent with the system design basis; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program.

This inspection constitutes one inservice inspection sample as defined in Inspection Procedure 71111.22.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification:

- Temporary Modification 368198 – Pressure Equalization Line MR90 Guidance for Stopple 0-4101-10, Revisions 0 and 1.

The inspectors compared the temporary configuration change and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to ensure that the modification was installed as directed; the modification operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modification did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance.

This inspection constitutes one sample as defined in Inspection Procedure 71111.23-05.

b. Findings

No findings of significance were identified.

Emergency Preparedness [EP]

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

.1 Review of Emergency Plan Changes

a. Inspection Scope

The inspectors performed a screening review of Revisions 24 and 25 of the Quad Cities Station Annex to the Standardized Emergency Plan to determine whether the revisions decreased the effectiveness of the licensee's emergency planning for the Quad Cities Station. This review did not constitute an approval of the changes, and as such, the changes are subject to future NRC inspection to ensure that the emergency plan continues to meet NRC regulations.

This inspection constitutes one sample as defined in Inspection Procedure 71114.04.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on October 2, 2007, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulated control room to verify that event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program.

This inspection constitutes one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Occupational Radiation Safety [OS]

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors reviewed licensee event reports, corrective action documents, electronic dosimetry (ED) transaction data for radiologically controlled area egress, and data reported on the NRC's web site relative to the licensee's occupational exposure control effectiveness performance indicator to determine whether the conditions surrounding any actual or potential performance indicator (PI) occurrences had been evaluated, reported as applicable, and that identified problems had been entered into the corrective action program for resolution.

This inspection constitutes one sample as defined in Inspection Procedure 71121.01-5.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors selected high and locked high radiation areas of the plant and reviewed radiation work permit (RWP) packages and radiation surveys for several of these areas. The inspectors evaluated the radiological controls and work control instructions to determine if these controls including postings and access control barriers were adequate.

The inspectors walked down and surveyed (using an NRC survey meter) radiologically significant area boundaries in the Units 1 and 2 Reactor, Turbine, and Radwaste Buildings to determine if the prescribed radiological access controls were in place, licensee postings were complete and accurate, and physical barricades/barriers were adequate. During the walkdowns, the inspectors challenged access control boundaries to determine if high radiation area (HRA), locked high radiation area (LHRA), and very high radiation area (VHRA) access was controlled in compliance with the licensee's procedure, TS, and the requirements of 10 CFR 20.1601, and was consistent with Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants."

The inspectors reviewed the licensee's methods for the assessment of internal dose, as required by 10 CFR 20.1204, to ensure methodologies were technically sound and included assessment of the impact of hard to detect radionuclides such as pure beta and alpha emitters, as applicable. The inspectors reviewed internal dose assessment results and associated calculations for selected workers that had positive whole body count results in 2007 through November 2007. No worker internal exposures greater than 50 millirem committed effective dose equivalent occurred for the period reviewed by the inspectors.

The inspectors reviewed the licensee's physical and programmatic controls for activated and/or contaminated materials (non-fuel) stored within the spent fuel pools in a manner which readily allowed their movement from the pools. Specifically, station procedures were reviewed; radiation protection staff was interviewed; and a walkdown of the refuel floor was conducted. In particular, the radiological control for non-fuel materials stored in the spent fuel pools was evaluated to ensure adequate barriers were in-place to reduce the potential for the inadvertent movement of these materials and to determine compliance with the licensee's procedure and for consistency with NRC regulatory guidance.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the results of radiation protection (RP) department self-assessments related to the radiological access control program and nuclear oversight department assessments and audits related to the RP program completed in 2007. The corrective action database along with individual issue reports related to the radiological access and exposure control programs were also reviewed to determine if identified problems were entered into the corrective action program for resolution. In particular, the inspectors reviewed radiological issues which occurred over the 11-month period that preceded the inspection including the review of any high radiation area radiological incidents (non-PI occurrences identified by the licensee in high and locked high radiation areas) to determine if follow-up activities were 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;
- Resolution of Non-Cited Violations (NCVs) tracked in the corrective action system;
- Identification of contributing causes; and
- Identification and implementation of corrective actions.

The inspectors evaluated the licensee's process for problem identification, characterization, and prioritization and determined if problems were entered into the corrective action program and were being resolved in a timely manner. For potential repetitive deficiencies or possible trends, the inspectors determined if the licensee's assessment activities were capable of identifying and addressing these deficiencies, if applicable.

The inspectors reviewed the licensee's documentation for all potential PI events occurring since the previous NRC review of the occupational exposure control effectiveness PI performed in November 2006 to determine if any applicable events involved dose rates greater than 25 Rem/hour at 30 centimeters or greater than 500 Rem/hour at 1 meter, or involved unintended exposures greater than 100 millirem total effective dose equivalent (or greater than 5 Rem shallow dose equivalent or greater than 1.5 Rem lens dose equivalent). None were identified.

These reviews represented four inspection samples. Specifically, the samples pertained to the licensee's self-assessment capabilities, its problem identification and resolution program for radiological incidents, a review of the licensee's ability to identify and address repetitive deficiencies, and a review of those radiological incidents and potential PI occurrences of greatest radiological risk.

b. Findings

No findings of significance were identified.

.4 Review of Work Practices in Radiologically Significant Areas

a. Inspection Scope

The inspectors reviewed the licensee's procedures, associated records and discussed with RP staff its practices for entry into locked high and very high radiation areas and for areas with the potential for changing radiological conditions such as steam sensitive areas at power. These reviews were conducted to determine the adequacy of the radiological controls and the radiological hazards assessment associated with such entries. Work instructions provided in RWPs and in pre-entry briefing documents were discussed with RP staff to determine their adequacy relative to industry practices and NRC Information Notices.

The inspectors also reviewed the licensee's procedure and generic practices associated with dosimetry placement and the use of multiple whole body and extremity dosimetry for work in areas having significant dose rate gradients for compliance with the requirements of 10 CFR 20.1201(c) and applicable industry guidelines. Additionally, previously completed work in areas where dose rate gradients were subject to significant variation such as work in the reactor cavity or under-vessel were reviewed to evaluate the licensee's practices for dosimetry usage and positioning.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.5 High Risk-Significant, Locked High Radiation Areas, and Very High Radiation Areas Access Controls

a. Inspection Scope

The inspectors reviewed the licensee's procedures and radiological job standards, and evaluated RP practices for the control of access to radiologically significant areas (high, locked high, and very high radiation areas). The inspectors assessed compliance with the licensee's Technical Specifications, procedures, and the requirements of 10 CFR Part 20, and for consistency with the guidance contained in Regulatory Guide 8.38. In particular, the inspectors evaluated the RP staff's control of keys to radiologically significant areas, the use of access control guards during work in locked high radiation areas (LHRAs), and methods and practices for independently verifying proper closure and locking of LHRA access doors upon area egress. The inspectors selectively reviewed LHRA key issuance/return and door lock verification records and key inventory records for selected periods in 2006 and 2007 to determine the adequacy of accountability practices and documentation. The inspectors also reviewed the licensee's practices for management approval for access into Level 2 LHRAs and very high radiation areas (VHRAs) (as applicable), and for the use of flashing lights in lieu of locking areas to determine if compliance with procedure requirements and those of 10 CFR 20.1602 was achieved.

The inspectors reviewed procedures and discussed with RP staff the controls that would be implemented for areas that had the potential to become high radiation areas during

certain plant operations to determine if these plant operations required communication beforehand with the RP group, so as to allow corresponding timely actions to properly evaluate the radiological hazards and post/control the areas as necessary.

The inspectors conducted plant walkdowns to verify the posting and locking of all entrances to LHRAs in the Unit 1 and 2 Reactor and Turbine Buildings and the common Radwaste Building. No VHRAs existed at the Quad Cities Station at the time of the inspection.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

Public Radiation Safety [PS]

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

.1 Follow-up on Potential Underground Line Leak From Contaminated Condensate Storage Tank(s)

a. Inspection Scope

The inspectors reviewed the licensee's groundwater sampling results, and evaluated the monitoring well locations and ongoing troubleshooting efforts following the licensee's recent identification of an apparent underground pipe leak associated with the contaminated condensate storage tanks (CCSTs) in October 2007. Sampling results were reviewed for June 2007 through November 2007 and many of the monitoring well locations were walked down by the inspectors. The purpose of the review was to determine whether the licensee identified the apparent leak in a timely manner and performed appropriate groundwater sampling to characterize the extent and magnitude of the radioactive (tritium) plume. Additionally, the inspectors reviewed the licensee's ongoing efforts to identify the leak location and discussed with the licensee its plans for leak repair as well as groundwater remediation options.

The licensee's sampling activities and results were reviewed to determine if samples were collected from representative locations so as to adequately identify and characterize the plume, and to determine if compliance with TS and 10 CFR Part 20 radionuclide concentration limits for unrestricted areas was achieved. Overall, the inspectors determined whether the licensee adequately evaluated the radiological impact of the apparent leak consistent with the requirements of 10 CFR 20.1501.

These reviews supplement previously completed inspection activities, therefore no samples were credited.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the third Quarter 2007 performance indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings of significance were identified.

.2 Mitigating Systems Performance Index - Emergency Alternating Current Power System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index (MSPI) - Emergency Alternating Current (AC) Power System performance indicator for Units 1 and 2 for the period from October 2006 through September 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in revision 5 of the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, MSPI derivation reports, issue reports, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constitutes two MSPI emergency AC power system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.3 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - High Pressure Injection Systems performance indicator for Units 1 and 2 for the period from October 2006 through September 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in revision 5 of NEI

Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constitutes two MSPI high pressure injection system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.4 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Heat Removal System performance indicator for Units 1 and 2 the period from October 2006 through September 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in revision 5 of NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constitutes two MSPI heat removal system samples as defined by Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.5 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Residual Heat Removal System performance indicator for Units 1 and 2 for the period from October 2006 through September 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in revision 5 of NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI

derivation reports, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constitutes two MSPI residual heat removal system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.6 Mitigating Systems Performance Index - Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems PI for Units 1 and 2 for the period from October 2006 through September 2007. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in revision 5 of NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator.

This inspection constitutes two MSPI cooling water system samples as defined in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

.7 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety, to determine if indicator related data was adequately assessed and reported for the period November 2006 through November 2007. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff the scope and breadth of its data review, and the results of those reviews. The inspectors independently reviewed electronic dosimetry dose rate and accumulated dose alarm reports, the dose assignments for any intakes that occurred and the licensee's corrective action database along with individual issue reports

generated during the period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of all locked high radiation area entrances to determine the adequacy of the controls in place for these areas.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Quarterly Review

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. In addition, in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing daily issue reports and attending periodic management review committee meetings.

This inspection was not counted as a sample due to its routine nature.

a. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors review was focused on air operated valves and consisted of a six month period from June 2007 through December 2007. The inspectors performed a similar review of operability determination and evaluation issues to determine if an adverse trend identified in June 2007 had continued. The inspectors reviewed multiple issue reports generated during the time period discussed above in an attempt to identify potential trends.

This represented one semi-annual trend sample.

b. Findings

No findings regarding air operated valves were identified. However, the inspectors determined that the adverse trend regarding recognizing the need to enter the operability

determination process and the technical rigor applied to operability discussions continued.

In Section 4OA2.4 of Inspection Report 2007003, the inspectors identified an adverse trend regarding the implementation of the operability determination and evaluation program described in OP-AA-108-115, "Operability Determinations." Specifically of the six operability issues reviewed during the second quarter of 2007, the inspectors identified technical deficiencies with four of the issues. During the last half of 2007, the inspectors have placed increased attention on the licensee's implementation and execution of the process described in OP-AA-108-115. The inspectors identified the following technical issues:

- Operations personnel failed to recognize that opening a degraded manual valve using equipment which was not staged was required to be evaluated to determine whether the additional time needed to open the valve adversely impacted the reactor;
- Engineering failed to address the impact of a compensatory measure implemented to address degraded reactor building ventilation damper solenoids until challenged by the inspectors; and
- Engineering failed to include operating experience information related to operation of the emergency diesel generator ventilation system during extreme outside air temperatures as part of an associated operability evaluation even though the licensee had received a significant number of questions on this issue from the inspectors. Following additional questioning, the information was added.

In addition to the technical issues, several programmatic issues were identified. They included:

- Operations personnel did not consistently request operability determinations and evaluations when required. Specifically, operations personnel failed to request an operability evaluation after reviewing an issue report which clearly indicated that the emergency diesel generator ventilation flow rates failed to meet design;
- The management review committee challenged the operations department regarding the need for an operability evaluation on the emergency diesel generator ventilation issue discussed above. However, the management review committee failed to recognize the need for additional corrective actions in this area since the actions taken following a 2006 standby liquid control tank event were not fully effective. The management team requested that an apparent cause review be performed on operability related issues after being challenged by the inspectors;
- The apparent cause report initiated by the management review committee was not approved until late November 2007 due to being rejected by the management review committee previously;
- In November 2007 the Nuclear Oversight Department completed their 2007 Operations Audit. The inspectors reviewed the results of this audit and found that equipment operability was determined to be an area requiring management attention; and
- The inspectors reviewed the results of a focused area self assessment performed by the engineering staff. Engineering personnel determined that the

operability process was deficient due to poor or incomplete documentation in corrective action documents and inconsistent application of an operability determination checklist which was implemented as part of the corrective actions for the 2006 standby liquid control tank event. The licensee planned to address the documentation issue as part of the Operations Department apparent cause report. Improved use of the checklist was being addressed within the Engineering Department.

The inspectors reviewed the results of the operations department's apparent cause evaluation. Several corrective actions were recommended including the development of an operability determination/evaluation lesson plan to provide further guidance. However, the inspectors noted that the licensee only planned to consider the need for additional training in this area. At the conclusion of the inspection, the licensee was continuing to implement actions recommended in the operations' apparent cause evaluation. The inspectors planned to review the licensee's corrective action implementation and the need for additional training as part of their routine inspection activities.

4OA3 Event Follow-Up (71153)

.1 Review of Motor Operated Valves Susceptible to Magnesium Rotor Degradation

a. Inspection Scope

In September 2007 the licensee conducted a Unit 1 shutdown following the failure of a high pressure coolant injection motor operated valve located inside the drywell. Following the shutdown, the licensee determined that the motor operated valve had failed due to the motor internals experiencing magnesium rotor degradation. The inspectors reviewed the licensee's procedures to determine the testing used to detect this type of degradation and the previous test results. The inspectors also reviewed pictures of the failed valve's motor and observed the inspection of other susceptible motors to determine if any additional valve motor replacements needed to be completed during the shutdown. Lastly, the inspectors reviewed the licensee's corrective action program database to determine whether the licensee had previously identified issues related to this valve or this type of degradation and if appropriate corrective actions were implemented.

This inspection constituted the completion of one sample as identified in Inspection Procedure 71153.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Institute of Nuclear Power Operations Plant Assessment Report Review

The inspectors reviewed the final report for the Institute of Nuclear Power Operations (INPO) plant assessment conducted in January 2007. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of

licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

.2 Operation of an Independent Spent Fuel Storage Installation (60855.1)

a. Inspection Scope

The inspectors observed select loading activities associated with cask number two to assess the licensee's compliance with the regulations in 10 CFR Part 72, its NRC license, TS, and the UFSAR requirements. The inspectors interviewed staff during the 2007 loading campaign to verify procedural adherence, adequate supervisory oversight, and communication. The inspectors attended the licensee's briefings, reviewed select operating procedures, radiation protection procedures, individual radiation dose records, welder qualifications, select issue reports since the last NRC inspection, and subsequent corrective actions taken to address issues that were encountered prior to and during the loading campaign. The inspectors also reviewed the work order package for cask number one. In addition, the inspectors reviewed surveillance records to ensure necessary surveillance checks of the casks that were in operation and the vent screens were free of debris.

The inspectors observed the licensee load fuel into the canister. The inspectors reviewed fuel selection packages including the fuel selection and fuel verification processes to verify they incorporated all the physical, thermal, and radiological fuel acceptance parameters specified in the current Certificate of Compliance and the TS. The inspectors verified that fuel loaded in all of the casks was undamaged.

The inspectors reviewed a number of 10 CFR 72.48 screenings and reference procedures to verify that changes made to the dry fuel storage process or the cask components did not adversely impact the design of the storage cask and its function.

b. Findings

No findings of significance were identified

The inspectors noted that the licensee experienced minor setbacks that resulted in issuing issue reports and some initial delays during the campaign attributed to a decrease in the availability in the number of staff during this campaign. The inspectors discussed these observations with licensee personnel and management.

.3 (Closed) Unresolved Item 05000254/2007003-03: Failure to Complete Qualified Reactor Vessel Shell Welds

The inspectors identified an unresolved item involving a Code qualified volumetric examination of the reactor vessel shell welds. The inspectors noted that the procedure used to perform the complete volumetric examination of the reactor vessel shell welds during Refueling Outage 18 referenced the use of cable lengths which differed from those demonstrated under the performance demonstration initiative (PDI). Specifically, the licensee's vendor used a longer cable length than that used in the ultrasonic testing (UT) procedure demonstration, which may have affected the flaw detection capability. The vendor performed a technical justification to support the procedure change which measured and applied bandwidth and center frequency shift criteria from

Section XI, Appendix VIII, Article 4110, "Pulsers, Receivers and Search Units." The vendor applied criteria from the ASME Code Section XI, Appendix VIII, Article 4110, which applied to pulsers, receivers, and search units, to justify the change in cable configuration. The inspectors questioned whether this Article could be applied to cables in that they were not specifically listed. The licensee believed that the issue was a Code interpretation and PDI implementation issue. This issue was considered an unresolved item pending clarification of the ASME Code requirements.

After consultation with the Office of Nuclear Reactor Regulation staff, the inspectors determined that the issue was a violation of 10 CFR 50.55a(g)4, in that the Code did not specifically mention cables in the Code reference. The vendor subsequently performed a successful demonstration at the Electric Power Research Institute for the cable length, cable type, and connectors used during the reactor vessel exams. Since the vendor successfully qualified the procedure for the cables used in the vessel exams, the inspectors concluded that this failure to comply with 10 CFR 50.55a(g)4 constituted a violation of minor significance and is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy.

.4 (Closed) Unresolved Item 05000265/2006007-03: Review of Switchgear Wetting Event and Associated Fire Protection Issues

Introduction: A self-revealing Green finding and a Non-Cited Violation of Technical Specification 5.4.1 was identified due to the failure to establish, implement, and maintain procedures associated with the fire protection program. The failure to implement and maintain these procedures resulted in a fire protection system hydraulic transient and the wetting of an electrical bus which powered risk-significant components.

Description: As discussed in Inspection Report 05000254/2006007; 05000265/2006007, the inspectors documented a November 10, 2006, transient which resulted in the simultaneous start of both diesel driven fire pumps and the wetting of switchgear that powered two feedwater pumps and a reactor recirculation pump. The inspectors reviewed this event and documented four items that required additional review. These items were resolved as follows:

Simultaneous Starting of Both Diesel Driven Fire Pumps

On November 17, 2006, the licensee's fire protection system engineer initiated Issue Report 559376 to document that the sequential starting of both diesel driven fire pumps during the November 2006 wetting event conflicted with the requirements of National Fire Protection Association (NFPA) 20, Section 9-5.2.3, 1976 Edition which stated:

- The controller for each unit of a multiple unit system shall incorporate a sequential timing device to prevent any one engine from starting simultaneously with any other engine.

The licensee conducted a review of this issue and was unable to locate any documentation which approved the simultaneous starting of both fire pumps as an NFPA code deviation. The licensee subsequently modified the fire pump starting circuitry to ensure that the fire pumps started sequentially rather than simultaneously.

The inspectors reviewed the details of this issue following the modification to the pump starting circuitry. The inspectors determined that this issue constituted a licensee identified violation of very low safety significance. See Section 4OA7 of this report for additional details.

Two Fire Protection Relief Valves May Not Have Operated as Designed

The inspectors reviewed Work Order 376431 which tested the diesel driven fire pump discharge relief valves on December 15, 2006, and January 8, 2007. The inspectors determined that the relief valves operated as designed. However, the previous method used to verify the relief valve setpoints was deficient. Specifically, workers verified the relief valve setpoints by starting the fire pumps and using a sight glass to watch for water flow as fire system pressure was raised on the inlet side of the relief valve. When water flow was observed, the corresponding reading on the fire pump discharge pressure gauge was documented as the relief valve setpoint. During the testing conducted in December 2006 and January 2007, the licensee identified that both relief valves started to open as system pressures reached 170 to 180 psig (normal relief valve setpoint band). However, the relief valves failed to fully actuate until fire protection system pressure reached 190 psig. The inspectors considered the previous instructions used to determine the relief valve setpoints to be a procedure adequacy issue.

Review of Fire Protection Strainer Maintenance Procedures

In April 2006 mechanical maintenance personnel disassembled fire protection system strainer 2-4127 using QCMMS 4100-28, “Unit 1 (2) Transformers Deluge System Functional Test and Multimatic Supply Strainer Flushes.” QCMMS 4100-28 required personnel to remove, clean, inspect and reassemble the strainer basket contained inside strainer 2-4127. These activities were considered to be skill of the craft. As a result, little to no instruction regarding these activities or the required flange bolt torque valves was contained within QCMMS 4100-28.

During the disassembly of strainer 2-4127 on November 10, 2006, the licensee found a portion of the flange gasket protruding past the edges of the flange faces. The licensee attempted to verify the bolt breakaway torque for the eight flange bolts. All of the bolts were found with torques less than the expected 60 foot pounds. A subsequent review of the strainer gasket found that the gasket was torn completely through in one spot and that 25 percent of the gasket was not compressed correctly. The licensee also determined that the strainer bail handle protruded outward such that it prevented proper flange contact and gasket compression. Due to the number of deficiencies identified with the re-installation of strainer 2-4127, the inspectors determined that this activity was not skill of the craft. As a result, instructions for removing, cleaning, inspecting and reassembling fire protection strainers needed to be included in QCMMS 4100-28. The lack of procedural guidance was determined to be a procedure adequacy issue.

Review of Fire Hydrant Flushing Procedure

As discussed in Inspection Report 05000254/2006007; 05000265/2006007, maintenance personnel were performing fire hydrant flushing in accordance with QCMMS 4100-12 prior to the wetting event. The inspectors interviewed personnel and reviewed QCMMS 4100-12 following the event. The inspectors determined that the wetting event occurred due to mechanical maintenance personnel failing to ensure that

control room personnel had opened valve 1/2-3906 (service water to fire protection cross tie valve) prior to flushing fire hydrants on November 10, 2006. The failure to ensure that valve 1/2-3906 was open was caused by a procedural inadequacy. Specifically, the body of QCMMS 4100-12 contained a step which directed maintenance personnel to ensure that the control room had opened valve 1/2-3906. However, Attachment 1 to QCMMS 4100-12 (which was used to track the completion of individual hydrant flushes) failed to contain a similar step. This was considered an additional procedural adequacy issue.

Analysis: The inspectors determined that the procedural adequacy issues discussed above were more than minor because they could be reasonably viewed as a precursor to a significant event. Taken in the aggregate, the procedural deficiencies could result in a wetting event which results in the tripping of risk-significant equipment and a reactor scram. The inspectors conducted a phase 1 Significance Determination Process evaluation and determined that this finding required a phase 2 evaluation because it affected both the Initiating Events Cornerstone due to the potential to cause a transient and the Mitigating Systems Cornerstone because it could result in the unavailability of two of the three feedwater pumps.

Due to the difficulties encountered assessing the risk of this event, the inspectors referred the issue to a regional senior reactor analyst (SRA). The SRA performed a phase 2 evaluation using the Risk-Informed Inspection Notebook for Quad Cities Nuclear Power Station, Revision 2.1a. The SRA solved the transient worksheet after increasing the likelihood of a transient event by one order of magnitude (from 1E-1 to 1.0) and decreasing the mitigation credit for the feedwater system from a multi-train system to a single train system to represent the postulated failure of the bus. The safety significance of the finding was determined to be very low (Green). The dominant sequence was a transient with failure of the power conversion system and the failure of all containment heat removal. The inspectors also determined this finding was cross-cutting in the area of Human Performance, Resources, Documentation due to the failure to have complete, accurate and up-to-date procedures (H.2(c)).

Enforcement: Technical Specification 5.4.1 requires that written procedures be established, implemented, and maintained for the items specified in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, Section 1 requires that procedures be established governing the fire protection program. Procedure CC-AA-211, “Fire Protection Program,” was the licensee’s administrative procedure governing the fire protection program. Step 3.1.6.1 required that licensee personnel ensure the adequacy of system test procedures and material condition. Contrary to the above, between April 2006 and November 2006, licensee personnel failed to establish, implement and maintain fire protection procedures associated with ensuring system relief valve setpoints, performing maintenance on deluge system strainers, and maintaining the material condition of fire hydrants. Because this violation was determined to be of very low safety significance, and because this issue was entered into the corrective action program as Issue Report 556335, it is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the Enforcement Policy **(NCV 05000265/2007005-01)**. Corrective actions for this issue included modifying the diesel driven fire pump starting sequence, and providing improved procedural instructions regarding relief valve setpoint verification, strainer maintenance, and fire hydrant flushing activities.

.5 (Closed) Unresolved Item 05000254/2007003-02; 05000265/2007003-02: Implementation of External Flooding Methodology

Introduction: The inspectors identified a finding of very low safety significance and a Non-Cited Violation of Technical Specification 5.4.1 due to the failure to develop adequate surveillance testing and operating procedures for equipment used as the sole source of makeup to the spent fuel pool following an external flooding event.

Description: As discussed in Inspection Report 05000254/2007003; 05000265/2007003, the inspectors performed the annual external flooding review to ensure that the licensee could adequately implement the external flooding methodology. The inspectors focused their efforts on ensuring the implementation of Exelon internal operating experience following the NRC's identification of multiple external flooding methodology issues at Dresden between 2002 and 2007. During this review, the inspectors identified several potential issues with the licensee's external flooding procedure and the overall implementation of the licensee's external flooding methodology. The problems were as follows:

- QCOA 0010-06, "Flood Emergency Procedure," failed to provide the location of the portable pump used to provide makeup water to the spent fuel pool;
- Operations personnel could not locate the portable pump;
- Operations personnel were unable to locate the portable pump's detachable fuel tank;
- Little to no instruction was provided to ensure that the portable pump was operated in a manner that ensured at least 200 gpm of makeup water was being supplied to the spent fuel pools following an external flood;
- The length of hose specified in QCOA 0010-06 may not have been adequate to reach from the pump's location to the actual flood water elevation. In this case, water would have been unable to be supplied to the spent fuel pool; and
- The licensee failed to have a program in place to demonstrate that the portable pump was capable of supplying the amount of flow specified by the Updated Final Safety Analysis Report.

In addition, the inspectors determined that Quad Cities Station was unaware of the previously identified external flooding issues at Dresden Station because formal operating experience was not issued.

The licensee reviewed the inspectors' concerns and agreed that QCOA 0010-06 lacked appropriate information regarding pump and fuel tank storage location, pump installation location and pump operation to ensure that the external flooding methodology was properly implemented. In response to this issue, the licensee reviewed the calculations supporting the external flooding methodology. Based upon the results of this review, the licensee expanded the number of locations where the portable pump could be installed to provide additional flexibility. The licensee also provided specific information regarding installation of the portable pump to ensure that the installation closely matched the conditions in place when the pump curve for the portable pump was developed. This provided additional assurance that the portable pump would provide the required amount of makeup flow to the fuel pool as specified in the UFSAR.

The inspectors reviewed the licensee's new revision to QCOA 0010-06 and the new portable pump installation locations. The inspectors determined that the information

provided in the procedure revision was adequate to ensure that the portable pump was quickly located and correctly installed. However, the inspectors remained concerned regarding the licensee's failure to develop or implement a surveillance test procedure to demonstrate that the portable pump provided the required makeup flow. This was especially noteworthy since one of Dresden's corrective actions included the development and implementation of a surveillance test program for the portable pumps used to support an external flooding event. On December 1, 2007, the licensee informed the inspectors that a surveillance test program for the portable pump would be developed and implemented.

Analysis: The inspectors determined that the failure to implement adequate surveillance testing and abnormal operating procedures that provided instructions to ensure an adequate supply of make-up water to the spent fuel pools following an external flood was more than minor because it involved the equipment performance and procedure quality attributes of the Mitigating Systems Cornerstone and affected the objective of ensuring the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors also determined that the failure to have an adequate external flooding procedure and implement an adequate surveillance test procedure for the portable pump was cross-cutting in the area of Human Performance, Resources, Documentation (H.2.(c)).

The inspectors conducted a phase 1 Significance Determination Process evaluation and determined that a phase 2 evaluation was needed because this finding impacted both the Initiating Events and Mitigating Systems Cornerstones. The inspectors referred this issue to a regional SRA for completion of the phase 2 evaluation due to the complexities in assessing external flooding events. The SRA determined that this finding was unable to be evaluated using the quantitative risk assessment tools because the frequency of an external flood of the magnitude requiring the portable pump was unknown. To further assess the risk associated with this finding, regional management utilized Inspection Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." Through this process, regional management concluded that this finding was of very low safety significance due to the extremely low probability of flooding of this magnitude and the large amount of time available to implement additional compensatory measures.

Enforcement: Technical Specification 5.4.1 requires that written procedures be established, implemented, and maintained for the items specified in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, Section 6.w requires that procedures be established to combat acts of nature including flooding. Contrary to the above, as of June 1, 2007, (1) the licensee failed to have a surveillance procedure to demonstrate that the portable pump used to supply makeup water to the spent fuel pool during an external flood could provide 200 gpm to the spent fuel; and (2) QCOA 0010-06 failed to provide detailed information such as pump and fuel tank location, installation instructions, and portable pump speed to ensure that at least 200 gpm were supplied to the spent fuel pools following an external flood. Because this issue is of very low safety significance and because this issue has been entered into the corrective action program as Issue Reports 624645 and 638004, this violation is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the Enforcement Policy **(NCV 05000254/2007005-02; 05000265/2007005-02)**. Corrective actions for this issue included revising QCOA 0010-06 and developing and implementing a surveillance procedure to

demonstrate that the portable pump will provide at least 200 gpm to the spent fuel pools following an external flood.

.6 (Closed) Unresolved Item 05000254/2007002-01; 05000265/2007002-01: Refuel Floor Crane Operator Disconnects Audible Alarm on Area Radiation Monitor

a. Inspection Scope

The inspectors reviewed the results of the licensee's internal investigation and an NRC Office of Investigations (OI) report related to an unresolved item (URI) identified during a radiation protection baseline inspection conducted in February 2007. The URI stemmed from an incident that occurred on January 29, 2007, in the reactor building that involved an audible alarm on a radiation monitor that was disconnected. The issue was held as an unresolved item pending the outcome of the OI investigation (EA-07-248).

b. Findings

Introduction: A willful violation of the licensee's procedure for use of the reactor building overhead crane was identified through an OI investigation. The investigation determined that a crane operator disconnected the audible alarm on the crane's area radiation monitor without the authorization or knowledge of the radiation protection or operations departments.

Description: As described in Section 2OS3.4 of Inspection Report 05000254/2007002; 05000265/2007002, on January 29, 2007, a reactor services department crane operator disconnected the audible alarm on the reactor building overhead crane area radiation monitor during start-up checks of the crane in preparation for its use that day. The planned activities for the day included using the crane to move two boxes of contaminated equipment from the refuel floor down to the trackway and load the boxes onto a vehicle for shipment. The crane operator reasoned that the audible alarm had malfunctioned and disconnected the alarm (horn) despite procedural requirements to obtain approval from both the Shift Manager and from the Radiation Protection Department before resuming crane operations following an alarm on the area radiation monitor. The issue was referred to OI due to the potential for a willful violation.

A contaminated piece of equipment was relocated on the refuel floor using the crane with its area radiation monitor alarm disconnected without the knowledge of any other individuals involved in the work activity and also without permission from either the radiation protection or operations departments. Shortly thereafter, a worker assisting the crane operator noticed that the alarm was disconnected, halted the work activity and the problem was reported to licensee supervision.

The incident had no actual and only minimal potential radiological consequence given the low radiation levels on the equipment that was moved (as pre-determined before the work activity) with the crane monitor disabled, the radiation levels on the boxes that were planned to be moved, and the electronic dosimetry worn by the work crew, including the crane operator. Moreover, although the audible alarm was disabled, the crane's area radiation monitor continued to function properly and provided a dose rate indication inside the crane cab which the crane operator recognized and monitored. Based on the electronic dosimetry worn by the work crew, crane cab dose rates during the incident

were determined to be a maximum of one millirem/hour while the crane operator received a dose less than one millirem.

Analysis: An OI investigation (OI Case No. 3-2007-010) completed on August 27, 2007, concluded that the crane operator willfully failed to follow the crane operating procedure when the audible alarm was disabled and work was continued using the crane without authorization. Given the lack of potential or actual radiological significance associated with the disabled alarm, the non-supervisory position of the crane operator that was involved, the limited benefit to the crane operator coupled with the individual's intent, the lack of management involvement or culpability, and the licensee's identification of the issue along with its response and the corrective actions taken, the violation was determined to be categorized at Severity Level IV.

The licensee's apparent cause evaluation determined that the crane operator lacked the necessary questioning attitude and had a flawed risk perspective. The licensee also determined that work on the refuel floor was not adequately supervised during the incident.

Enforcement: Quad Cities Technical Specification 5.4.1, "Procedures," requires that written procedures be established, implemented and maintained covering the activities provided in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Procedures specified in Regulatory Guide 1.33 include those for: (1) control of radiation for limiting personnel exposure; and (2) area radiation monitoring system operation.

Quad Cities procedure QCMM 5800-05, "Reactor Building Overhead Crane Utilization," Revision 18, effective February 20, 2006, implements Technical Specification 5.4.1 as provided in Regulatory Guide 1.33. Section 3.2.11 of that procedure requires, in part, that crane operations following a high radiation alarm on the crane area radiation monitor be continued only after authorization from the Shift Engineer and Radiation Protection. Additionally, Section 3.2.11 requires, in part, that handling of radioactive materials with a malfunctioning crane radiation monitor be resumed only after authorization from the Shift Manager and Radiation Protection.

Contrary to the above, on January 29, 2007, the overhead crane area radiation monitor alarmed while the crane was being prepared to handle (lift) radioactive materials, the alarm was disconnected (silenced) by the crane operator and crane operations continued without permission from either the Shift Engineer or the Radiation Protection Department. Subsequently, radioactively contaminated equipment was handled using the crane with its radiation monitor alarm disabled and the monitor assumed to be malfunctioning without authorization from the Shift Manager or Radiation Protection. Corrective actions for this issue included disciplinary action for the crane operator, direct supervisory oversight of all reactor services department work until reactor services procedures were reviewed for adequacy and level of use, training for all reactor services staff on procedure use/adherence, and testing of reactor services staff to assess field knowledge, skills and procedure adherence.

No tracking number was assigned to this violation due to it being licensee identified.

4OA6 Management Meetings

.1 Interim Exit Meetings

Interim exit meetings were conducted for:

Licensed Operator Requalification Training Program inspection results with Mr. T. Tulon, on November 2, 2007.

Licensed Operator Requalification Training Annual Operating Test results with Mr. D. Snook, on November 29, 2007, via telephone.

Occupational Radiation Safety Radiological Access Control inspection with Messrs. T. Tulon, R. Gideon and other licensee staff on November 30, 2007.

Emergency Preparedness inspection with Mr. W. Beck on December 18, 2007.

Independent Spent Fuel Storage Installation inspection with Mr. M. Wagner on January 2, 2008, via telephone.

.2 Exit Meeting Summary

On January 8, 2008, the inspectors presented the inspection results to Mr. R. Gideon and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

- The violation described in Section 4OA5 of this inspection report was identified by the licensee and meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being disposed as a Non-Cited Violation.
- Section 3.F of Quad Cities Station Operating Licenses DPR-29 and DPR-30 requires that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR and approved in various safety evaluation reports. This included compliance with the associated NFPA Codes. NFPA 20, 1976 Edition, Section 9-5.2.3 requires the controller for each unit of multiple pump units shall incorporate a sequential timing device to prevent any one engine from starting simultaneously with any other engine or a deviation from the code shall be requested. Contrary to the above, on November 10, 2006, the fire pumps failed to have controllers which incorporated a sequential timing device. In addition, the licensee failed to request a deviation from the NFPA Code for this condition. This was identified in the licensee's corrective action program as Issue Report 559376. This finding was of very low safety significance because it did not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Tulon, Site Vice President
R. Gideon, Plant Manager
B. Adams, Engineering Manager
D. Barker, Work Control Manager
W. Beck, Regulatory Assurance Manager
J. Burkhead, Nuclear Oversight Manager
D. Craddick, Maintenance Manager
K. Moser, Training Manager
V. Neels, Chemistry/Environ/Radwaste Manager
K. Ohr, Radiation Protection Manager
R. Svaleson, Operations Manager

Nuclear Regulatory Commission

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

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000265/2007005-01	NCV	Inadequate Fire Protection Procedures
05000254/2007005-02; 05000265/2007005-02	NCV	Inadequate Procedures for External Flooding and Testing of Flooding Pump

Closed

05000254/2007003-03	URI	Failure to Complete Qualified Reactor Vessel Shell Welds
05000265/2006007-03	URI	Review of Switchgear Wetting Event and Associated Fire Protection Issues
05000254/2007003-02; 05000265/2007003-02	URI	Implementation of External Flooding Methodology
05000254/2007002-01 05000265/2007002-01	URI	Refuel Floor Crane Operator Disconnects Audible Alarm on Area Radiation Monitor
05000265/2007005-01	NCV	Inadequate Fire Protection Procedures
05000254/2007005-02; 05000265/2007005-02	NCV	Inadequate Procedures for External Flooding and Testing of Flooding Pump

LIST OF DOCUMENTS REVIEWED

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

1R01 Adverse Weather Protection

Issue Reports:
- 478424; Winter 2005/2006 Readiness Critique; dated April 13, 2006
- 644873; Winter 2007/2008 Readiness Critique; dated June 27, 2007

Procedures:
- WC-AA-107; Seasonal Readiness; Revision 5
- QCOP 0010-01; Winterizing Checklist; Revision 39
- QCOP 0010-02; Required Cold Weather Routines; Revision 26
- QCOP 4400-06; Circulating Water System Deicing; Revision 13B
- QOP 5700-01; Heating Boiler Startup and Operation; Revision 40
- QCOP 6600-01; Diesel Generator 1(2) Preparation for Standby Operation; Revision 33
- QOM 1-6600-01; Unit 1 Diesel Generator Valve Checklist; Revision 21
- QOM 2-6600-01; Unit 2 Diesel Generator Valve Checklist Revision 20

1R04 Equipment Alignment

Issue Reports:
- 685578; Unit ½ EDGCWP Tripped During QCOS 6600-43; dated October 16, 2007

Procedures:
- QOM 2-1400-10; Core Spray Valve Checklist; Revision 4
- QCOP 1400-01; Core Spray System Preparation for Standby Operation; Revision 18
- QCOS 6600-43; Unit 1 (2) Emergency Diesel Generator Load Test; Revision 27

1R05 Fire Protection

Other:
- Updated Final Safety Analysis Report
- Quad Cities Station Fire Hazards Analysis

1R11 Licensed Operator Requalification Program

Issue Reports:
- 692811; “Simulator Problem Occurs During Annual Exams;” dated November 1, 2007
- 393341; “Exam Security Near Miss During NRC IP 71111.11 Inspection;” dated November 2, 2007

Procedures:
- TQ-AA-302; Simulator Testing and Documentation; Revision 7
- TQ-AA-106; Licensed Operator Requal Training Program; Revision 8

- TQ-AA-201; Examination Security and Administration; Revision 9
- TQ-AA-302-0103; Simulator Testing Review Board Cover Sheet; Revision 7; 9 examples for the 2007 Simulator Testing Review Board meetings
- LS-AA126; Self-Assessment Program; Revision 5:
- TQ-AA-106; Licensed Operator Requalification Training Program; Revision 8
- TQ-AA-210; TSD Process Activities; Revision 9
- TQ-AA-106-0115; Simulator Demonstration Examination Shift Manager Competency Evaluation Form for 2 Senior Operators
- TQ-AA-106-0113; Simulator Demonstration Examination Individual Competency Evaluation Form for 10 Operators
- TQ-AA-106-0114; Simulator Demonstration Examination Crew Competency Evaluation Form for 2 crews

Other:
- OP-AA-105-102; Active License Tracking Log, Revisions 7 and 8; Several examples for currently active operator licenses over the past 2 years
- Current List and Summary of Simulator Work Requests; dated November 2007
- Simulator Malfunction Tests performed November 2007; 13 examples
- Current Schedule of Simulator Malfunction Tests; dated November 2007
- Current List of Simulator Core Performance Tests; dated November 2007
- Simulator Review Board minutes for 2006 and 2007
- Differences List between the Quad Cities Simulator and Quad Cities Units 1 and 2; dated November 2007
- Simulator Coordinator's responses to the questions of Inspection Procedure 71111.11; Licensed Operator Requalification Program, Appendix C, CHECKLIST FOR EVALUATING PLANT-REFERENCED SIMULATORS OPERATING UNDER 10 CFR 55.46(c) AND (d); dated November 2007
- Simulator Certification Reports since November 2005
- Plant Operating History since November 2005
- Current Medical Records and Forms for 10 active licensed operators; dated November 2007
- Requalification Annual Operating Tests 2007
- Requalification Biennial Written Examinations 2007
- Mod & Lessons Learned training modules MLL 2007-01 through MLL 2007-05
- 2007 Continuing Training Classroom Schedule Rev 3
- Self Assessment "2007 Licensed Operator Requalification Training Pre NRC 71111.11 Inspection"
- Quad Cities Station Training and Staffing Audit NOSA-QDC-06-06
- LORT Curriculum Review Committee, Meeting Minutes 5 examples June 14, 2006 through August 28, 2007
- TQ-AA-210-4101; Remedial Training Notification and Action on Failure; Revision 1 for the Test/Eval Date: 10/11/2007

1R12 Maintenance Effectiveness

Issue Reports:
- Various Issue Reports Associated with the Service Water System; dated October 1, 2005 through October 23, 2007

Procedures:
- ER-AA-310; Implementation of the Maintenance Rule; Revision 6

- WC-AA-106; Work Screening and Processing; Revision 5
- WC-AA-101-1004; On-line Maintenance for Limiting Condition for Operation of Systems or Components; Revision 4
- WC-AA-101; On-line Work Control Process; Revision 13

Work Orders:
- Review of Maintenance Rule Database Information

1R13 Maintenance Risk Assessments and Emergent Work Control

Other:
- Work Week Safety Profiles
- Daily Production Schedules
- Completed Risk Factor Charts for Specific Times and Days

1R15 Operability Evaluations

Issue Reports:
- 671583; Electrical Ground Search Differences Amongst Stations; dated September 14, 2007
- 707714; PS 1-0504-A,B,C,D Not Meeting Vendor Specifications; dated December 5, 2007
- 705532; Repeatability Issue On ERV Solenoid in EQ Testing Offsite; dated November 30, 2007

Procedures:
- QCOS 5750-02; Control Room Emergency Filtration System Test; Revision 41
- QCAP 0230-19; Equipment Operability; Revision 16
- ER-AA-321; Administrative Requirements for Inservice Testing; Revision 8
- QCOP 1000-04; RHR Service Water System Operation; Revision 18
- QCOP 0280-01; Reactor Manual Control System; Revision 13
- QCOS 0300-01; Control Rod Drive Exercise; Revision 32
- QCOA 0300-04; Mispositioned Control Rod; Revision 13
- QCOP 0300-30; Control Rod Drive Abnormality Record; Revision 8
- QCOP 0300-11; Control Rod Drift; Revision 11
- QCOP 0300-18; Control Rod Exercising; Revision 19
- QCIS 0500-04; Unit 1 Division I Turbine First Stage Low Pressure Above Setpoint Calibration and Functional Test; Revision 12
- QCEMS 0250-13; Dresser Electromatic Solenoid Actuator Installation, Replacement, Inspection, and EQ Surveillance; Revision 22
- QCEM 0200-13; Dresser Electromatic Solenoid Rebuild Instructions; Revision 1

Other:
- Letter from E.W. Ralls, Electromotive Division to Brad Abernathy, MKW Power Systems; Maximum Control Cabinet Temperatures; dated March 1, 1991
- NRC Information Notice 87-09; Emergency Diesel Generator Room Cooling Design Deficiency; dated February 5, 1987
- NRC Information Notice 91-29, Supplement 1; Deficiencies Identified During Electrical Distribution System Functional Inspections; dated September 14, 1992

1R19 Post Maintenance Testing

Issue Reports:
- 714471; Auxiliary Contact Plunger Misadjusted; dated December 20, 2007
- 714572; During Initial Pump run Outboard Mechanical Seal Disaster Bushing Rub; dated December 21, 2007

Procedures:
- MA-AA-716-012; Post Maintenance Testing; Revision 10
- QCOP 1400-01; Core Spray System Preparation for Standby Operation; Revision 11

Work Orders:
- 912446; B Core Spray Pump Flow Rate Comprehensive Test; dated September 24, 2007
- 1056177; Perform Troubleshooting on the ½ Emergency Diesel Generator Cooling Water Pump; dated October 17, 2007

1R22 Surveillance Testing

Procedures:
- QCOP 0280-01; Reactor Manual Control Operation; Revision 13
- QCOA 0300-04; Mispositioned Control Rod; Revision 13
- QCOP 0300-30; Control Rod Drive Abnormality Record; Revision 8
- QCOP 0300-11; Control Rod Drift; Revision 11
- QCOP 0300-18; Control Rod Exercising; Revision 19
- ER-AA-321; Administrative Requirements for Inservice Testing; Revision 8
- QCOS 6600-42; Unit 2 Emergency Diesel Generator Load Test; Revision 42
- QCOS 1400-01; Quarterly Core Spray System Flow Test; Revision 34
- ER-AA-302-1001; MOV Rising Stem Motor Operated Valve Thrust and Torque Sizing Setup Window Determination Methodology; Revision 5
- ER-AA-302-1004; Motor Operated Valve Performance Testing; Revision 4

1R23 Temporary Plant Modifications

Issue Reports:
- 713137; ½ A Fire Diesel Auto Start and Oil Leak; dated December 18, 2007
- 713260; Fire DG Started during TMOD Installation; dated December 18, 2007

Work Orders:
- 1077689; Replace Cribhouse Fire Protection to Service Water Cross-Tie Bypass Valve 1-4199-186

1EP4 Emergency Action Level and Emergency Plan Changes

- Quad Cities Nuclear Power Station Annex of the Exelon Standardized Emergency Plan; Revisions 23, 24, and 25

2OS1 Access Control to Radiologically Significant Areas

Issue Reports:
- 577452; Increased Dose Rates Identified During Survey; dated January 10, 2007

- 629544; Valve Plug Removed Without RP Support; dated May 15, 2007
- 656390 & 618233; Electronic Dosimetry Dose Rate Alarm; dated August 2, and April 17, 2007
- 626850; Individual Working in the Regenerative Heat Exchanger Room Received A Rate Alarm; dated May 8, 2007
- 581039; Higher than Expected Dose Rates in Phase Separator Tank Room; dated January 19, 2007

Procedures:
- RP-AA-376-1001; Radiological Posting, Labeling and Marking Standard; Revision 13
- RP-QC-463; Access Control of Areas Affected by Hydrogen Addition; Revision 1
- RP-AA-210; Dosimetry Issue, Usage and Control; Revision 10
- RP-AA-460; Controls for High and Very High Radiation Areas; Revision 13
- RP-QC-460-1004; Secure High Radiation Area Controls; Revision 1
- RP-AA-222; Methods for Estimating Internal Exposure From In-Vivo and In-Vitro Bioassay Data; Revision 3
- QCOS 0010-03; Safe Shutdown Equipment Inspection Surveillance Record; dated September 30, 2007
- NF-AA-390; Spent Fuel Pool Material Control; Revision 2 and Associated Material Inventory Log; updated September 2007
- RP-QC-460-1002; High Radiation Area Inspections; Revision 0 and Associated Surveillance Records for 2007
- RP-QC-465; drywell and Torus Entry; Revision 3
- QCOS 1000-06; RHR Pump/Loop Operability Test; Revision 43
- QCOP 1000-05; Shutdown Cooling Operation; Revision 38
- QCOS 1000-29; RHR Heat Exchanger Thermal Performance Test; Revision 11

Radiation Work Permits:
- RWP 10007763; Control Rod Drives - Remove/Replace; Revision 4
- RWP 10007931; Radwaste Shipping Activities; Revision 0
- RWP 10007721; Unit-1 Torus Desludge & Painting - Diving Activities; Revision 0

Other:
- RP Self-Assessment Report; Access Control to Radiologically Significant Areas; dated April 9, 2007
- RP Self-Assessment Report; Check-In Performance Indicator and Access Control to Significant Areas; dated October 22, 2007
- Nuclear Oversight Assessment No. NOSPA-QC-06-3Q; Radiological Posting and Housekeeping; dated September 27, 2006
- Nuclear Oversight Assessment No. NOSPA-QC-07-1Q; Posting and Control for Floor Plugs; dated January 19 - 22, 2007
- Nuclear Oversight Assessment No. NOSPA-QC-07-1Q; Radiological Postings in the Reactor Building; dated February 2, 2007
- Nuclear Oversight Assessment No. NOSPA-QC-07-2Q; Plant Observations for RP; dated June 29, 2007
- Nuclear Oversight Audit Report; Audit NOSA-QDC-07-06; Radiation Protection; dated August 22, 2007

<u>2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems</u>

- Hydrogeologic Investigation Report for Quad Cities Generating Station; September 2006

- Monitoring Well Sampling Results for June 2007 - November 2007 and Tritium Troubleshooting Action Matrix

4OA1 Performance Indicator Verification

- Operations Logs for various months in 2006 and 2007
- Electronic Dosimetry (ED) Alarm and ED Transaction Reports; Selected Data for 2007
- LS-AA-2140; Monthly PI Data Elements; December 2006 - November 2007
- Issue Report Database (RP Department Generated or Assigned); December 2006 – November 2007

4OA2 Problem Identification and Resolution

Issue Reports:
- 676064; Question Concerning Determination of Op Eval Necessity; dated September 26, 2007
- 692548; NRC Identified Issue Associated with Operability Evaluation 684885; dated October 30, 2007
- 693115; NOS ID Equipment Operability Requires Management Attention; dated November 1, 2007
- 710832; ACE 690667 was Rejected by Management Review Committee; dated December 10, 2007
- 700546; Op Determination FASA Deficiencies Identified; dated November 16, 2007
- 656537; Prompt Op Evaluation Not Requested for EDG Degraded Condition; dated August 1, 2007
- 669981; Additional Information Added to EDG HVAC Operability Determination; dated September 11, 2007
- 498438; Focused Area Self Assessment – Air Operated Valve Program in Engineering Projects; dated June 9, 2006
- 669981; Additional Information Added to EDG HVAC Operability Determination; dated September 11, 2007
- 656537; Prompt Operability Evaluation Not Requested for EDG Degraded Condition; dated August 2, 2007
- 653838; EDG Ventilation Heat Load Deficiency; dated July 25, 2007
- 700546; Operability Determination FASA Deficiencies Identified; dated November 16, 2007
- 639115; NOS Identified Equipment Operability Requires Management Attention; dated November 1, 2007
- 692548; NRC Identified Issue Associated with Operability Evaluation 684885; dated October 31, 2007

Other:
- Maintenance Rule System Z5704 Availability/Reliability Evaluation from October 1, 2006 - November 1, 2007

4OA3 Event Follow-up

Other:
- Apparent Cause Report 556335-03; Fire Protection System Strainer Flange Gasket Boundary Failed due to Improper Installation; dated January 30, 2007
- Calculation QDC-0000-M-1590; Emergency Flood Pump Evaluation; dated August 16, 2007

- Equipment Apparent Cause Report 667490; High Pressure Coolant Injection Valve Failed due to Magnesium Rotor Degradation; dated November 8, 2007
- Troubleshooting Plan 1059022; High Pressure Coolant Injection Valve Failure to Stroke; dated September 2007
- NRC Information Notice 2006-26; Failure of Magnesium Rotors in Motor Operated Valve Actuators; dated November 20, 2006
- Failure Analysis of Motor Operator 1-2301-4 for Quad Cities Unit 1; date unknown

Procedures:
- ER-AA-302-1006; Generic Letter 96-05 Program Motor-Operated Valve Maintenance and Test Guidelines; Revision 4

4OA5 Other Activities

Issue Reports:
- 584636; ARM Alarm Speaker Unplugged by RBOHC Operator; dated January 29, 2007

Procedures:
- QCMM 5800-05; Reactor Building Overhead Crane Utilization; Revision 18

Other:
- Apparent Cause Report for Condition Report 584636; ARM Audible Alarm Disconnected by Crane Operator;
- Quick Human Performance Investigation Report for Condition Report 584636; ARM Audible Alarm Disconnected by Overhead Crane Operator

LIST OF ACRONYMS USED

AC	Alternating Current
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
CCST	Contaminated Condensate Storage Tank
ED	Electronic Dosimeter
HRA	High Radiation Area
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
JPMs	Job Performance Measures
LHRA	Locked High Radiation Area
LORT	Licensed Operator Requalification Training
MWe	Megawatts Electric
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
OI	Office of Investigations
PDI	Performance Demonstration Initiative
PI	Performance Indicator
RP	Radiation Protection
RWP	Radiation Work Permit
SAT	Systems Approach to Training
SDP	Significance Determination Process
SRA	Senior Reactor Analyst
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Testing
VHRA	Very High Radiation Area