

January 31, 2007

EA 06-307

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
Quad Cities Nuclear Power Station
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2
NRC INTEGRATED INSPECTION REPORT 05000254/2006007;
05000265/2006007 and 05000254/2006016; 05000265/2006016

Dear Mr. Crane:

On December 31, 2006, 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 9, 2007, with Mr. Tulon and other members of your staff.

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

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green). One of these issues involved a violation of NRC requirements. However, because this violation was of very low safety significance and because the issue was entered into your corrective action program, the NRC is treating this finding as a Non-Cited Violation (NCV) in accordance with Section V1.A.1 of the NRC's Enforcement Policy.

If you contest the subject or severity of a NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulation Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Quad Cities Nuclear Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure and response, if you choose to respond, 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) and is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000254/2006007; 05000265/2006007 and
05000254/2006016; 05000265/2006016
w/Attachment: Supplemental Information

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

C. Crane

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Mid American Energy Company
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State Liaison Officer, State of Illinois
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-254, 50-265

License Nos: DPR-29, DPR-30

Report No: 05000254/2006007; 05000265/2006007 and
05000254/2006016; 05000265/2006016

Licensee: Exelon Nuclear

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

Location: Cordova, Illinois

Dates: October 1, 2006, through December 31, 2006

Inspectors: K. Stoedter, Senior Resident Inspector
M. Kurth, Resident Inspector
C. Acosta, Reactor Inspector
J. House, Senior Radiation Protection Inspector
B. Palagi, Senior Operations Engineer
W. Slawinski, Senior Radiation Protection Inspector
R. Ganser, Illinois Emergency Management Agency

Observers: M. Thorpe-Kavanaugh, Project Manager, NRR

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

Enclosure

SUMMARY OF FINDINGS

IR 05000254/2006007, 05000265/2006007, 05000254/2006016, 05000265/2006016;
10/01/2006 - 12/31/2006; Quad Cities Nuclear Power Station, Units 1 & 2; Problem
Identification and Resolution and Event Followup.

The report covered a 3-month period of inspection by resident inspectors and announced inspections by operator licensing, radiation protection, and heat sink inspectors. Two Green findings, one of which was a Non-Cited Violation (NCV), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green finding due to the licensee's performance of maintenance without documented work instructions on two occasions. In one instance, the licensee failed to identify that the agitation of the 2A reactor feedwater pump minimum flow valve solenoid on November 26, 2006, constituted a maintenance activity. As a result, actions were not taken to address the undocumented maintenance activity. Immediate corrective actions included briefing personnel on both events, stopping the associated work activities, providing enhanced guidance on manual agitation of equipment, and reinforcing that documented work instructions were required prior to performing maintenance.

The inspectors determined that this issue was more than minor because if left uncorrected, it could lead to the performance of additional, undocumented maintenance activities on both safety-related and non-safety related equipment. The finding was of very low safety significance because the maintenance did not result in a loss of safety function for any system. The inspectors concluded that this finding was cross-cutting in the area of human performance (work practices) in that human error prevention techniques were not utilized, the proper documentation of activities did not occur, and personnel proceeded in the face of uncertainty. No violation of NRC requirements was identified due to the undocumented maintenance being performed on non-safety related equipment. (Section 4OA2.3)

- Green. The inspectors identified a Green finding and NCV of Technical Specification 3.1.7 due to the licensee's failure to enter the associated limiting condition for operation upon obtaining information which challenged the continued operability of the Unit 1 standby liquid control tank in October 2006. Corrective actions for this issue included conducting additional reviews of prompt operability documentation and providing feedback to operations and engineering

personnel. The licensee was also in the process of developing and implementing guidance to improve the quality and timeliness of operability decisions.

This issue was more than minor because it resulted in the Technical Specification 3.1.7 Limiting Condition for Operation Action Times being exceeded prior to requesting a Notice of Enforcement Discretion from the NRC. In addition, if left uncorrected, the failure to enter Technical Specifications at the appropriate time could result in delaying actions used to ensure continued safe plant operations. This issue was of very low safety significance because the standby liquid control tank leak did not result in a loss of system safety function. The inspectors determined that this finding was cross-cutting in the area of human performance (decision-making) in that the licensee did not use conservative assumptions in decision making. (Section 4OA3.1)

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at maximum achievable power levels during the inspection period with the following exceptions:

- On October 13, 2006, operations personnel began a Technical Specification-required shutdown after failing to restore the Unit 1 standby liquid control tank to an operable condition within the required time. Within 1 hour of beginning the power reduction, the NRC granted Quad Cities Unit 1 a Notice of Enforcement Discretion which allowed Unit 1 to remain at power while the standby liquid control tank was repaired. See Section 4OA3.1 for additional details.
- On December 18 operations personnel lowered reactor power to 88 percent to allow one control rod to be removed from service. Reactor power was restored to normal levels within hours.
- On December 30 operations personnel lowered reactor power to 80 percent to allow one control rod to be returned to service. Reactor power was restored to normal levels later the same day.
- An additional planned power reduction was conducted to allow for routine turbine testing, control rod scram time testing, and a control rod sequence exchange.

Unit 2 operated at maximum achievable power levels during the inspection period with the following exceptions:

- On November 20, 2006, reactor power was reduced to 88 percent to allow one control rod drive to be removed from service for maintenance.
- On November 25 operations personnel lowered reactor power by 200 megawatts electric to allow for routine turbine testing, control rod scram time testing, and control rod sequence exchanges. Reactor power was restored to normal levels within 8 hours.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

During the quarter, the inspectors assessed the licensee's readiness for cold weather conditions by conducting detailed inspections of the 1C traveling screen repair efforts and the resolution of a degraded condensate storage tank heater bank. The 1C traveling screen was chosen as an inspection sample due to the repeated shearing of pins within the screen's drive mechanism. The inspectors were concerned that the 1C

screen may be more susceptible to pin shearing during extreme cold conditions due to the possible formation of frazil ice or other river conditions. The inspectors performed a direct observation of the licensee's traveling screen maintenance which included reviewing the maintenance work package, ensuring that the maintenance activities were conducted in accordance with the work package and procedural instructions, verifying that issues found during the maintenance were documented in issue reports, and reviewing the issue reports to confirm that the licensee's actions would address the identified problems.

The inspectors reviewed the condensate storage tank issue because this tank provided makeup water to the turbine building closed cooling water system (a high risk system). The inspectors attended meetings where the licensee discussed heater repair/ replacement options and the need for compensatory measures should the remaining functional heater bank fail. The inspectors reviewed the licensee's calculation used to predict the weather conditions under which the tank could freeze. The inspectors placed increased emphasis on the assumptions used in the calculation to ensure that the assumptions and the results were reasonable.

This inspection represents the completion of two cold weather samples.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors performed a partial walkdown of the system listed below to verify the operability of redundant or diverse trains and components when other equipment was inoperable. The inspectors reviewed applicable operating procedures, walked down control systems components, and verified that selected breakers, valves, and support equipment were in the correct position to support system operation. These activities also served to ensure that the licensee had not inadvertently rendered the redundant equipment inoperable or unavailable. The inspectors verified that the licensee had utilized their corrective action program to properly identify and resolve equipment alignment problems that could cause initiating events or impact the availability of mitigating systems or barriers.

- Unit 2 Control Rod Drive System

This represents the completion of one quarterly inspection sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

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

- Fire Zone 1.1.1.5 - Unit 1 Reactor Building, 666 ft. elevation, Standby Gas Treatment 4th Floor East;
- Fire Zone 1.1.2.5 - Unit 2 Reactor Building, 666 ft. elevation, Standby Gas Treatment 4th Floor East;
- Fire Zone 11.1.4 - Unit 2 Reactor Building, 554 ft. elevation, High Pressure Coolant Injection Room;
- Fire Zone 11.4.B - Crib House Building, 595 ft. elevation, Ground Floor Service Water Pumps;
- Fire Zone 11.2.2 - Unit 1 Reactor Building, 554 ft. elevation, 1B Residual Heat Removal Room; and
- Fire Zone 11.3.3 - Unit 2 Reactor Building, 554 ft. elevation, Northwest Corner Room - 2A Core Spray.

This inspection represents the completion of six quarterly inspection samples.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07B)

.1 Biennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the performance of the 1B and 2B core spray pump room coolers, and the 1A and 2B emergency diesel generator engine coolers. These heat exchangers were chosen for review based on their high risk assessment worth in the licensee's probabilistic safety analysis. While on-site, the inspectors verified that the inspection/maintenance were adequate to ensure proper heat transfer. This was done by conducting independent heat transfer capability calculations, reviewing the methods used to inspect the heat exchangers, and verifying that the as-found results were

appropriately dispositioned, such that the final condition was acceptable. The inspectors also verified, by review of procedures and test results, that chemical treatments, ultrasonic tests, eddy current tests and methods used to control biotic fouling corrosion, and macrofouling were sufficient to ensure required heat exchanger performance.

The inspectors verified that the condition and operation of these heat exchangers were consistent with design assumptions in heat transfer calculations by conducting a walkdown of the intake bay, the selected heat exchangers and the pumps that supply these heat exchangers and by reviewing related procedures and surveillance. The inspectors also verified that redundant and infrequently used heat exchangers were flow tested periodically at maximum design flow. This was performed by reviewing related procedures and surveillance.

The inspectors verified the performance of the ultimate heat sink and its sub-components, such as piping, intake screens, intake bays, pumps, valves, etc., by reviewing procedures, surveillance, and inspections conducted on the system.

The inspectors verified that the licensee had entered significant heat exchanger/heat sink problems into their corrective action program. The inspectors reviewed issues entered to verify that the corrective actions taken were appropriate.

This inspection represents completion of two inspection samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of individual Job Performance Measure operating tests, and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)), administered by the licensee during calendar year 2006. The overall 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 Implementation (71111.12)

a. Inspection Scope

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

- River Screenhouse (Function Z4000)

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

This review represented the completion of one inspection sample.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

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

- Work Week 41 including emergent maintenance on the Unit 1 standby liquid control system and planned maintenance on the Unit 1 A control rod drive pump, Unit ½ emergency diesel generator, and the Unit 1 250 volt direct current charger;
- Work Week 42 including emergent maintenance on the Unit 1 reserve auxiliary transformer and planned maintenance on the Unit 1 high pressure coolant injection and Unit 2 A core spray systems;

- Work Week 43 including planned maintenance on the Unit 1 reactor core isolation cooling system, Unit ½ B standby gas treatment system, and the control room emergency ventilation system; and
- Work Week 44 including planned maintenance on the Unit 2 A control rod drive pump, Unit ½ B diesel fire pump, and the Unit ½ emergency diesel generator.

This inspection represents the completion of four inspection samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated the technical adequacy of the functionality reviews or operability evaluations listed below to ensure that the operability or functionality of the specified equipment was properly justified. The inspection was performed by taking the information provided by the licensee and comparing it to information included in documents such as Technical Specifications, the Updated Final Safety Analysis Report, calculations, drawings, and procedures. In addition, the inspectors reviewed any necessary compensatory measures to verify that the measures worked as stated and that the measures were adequately controlled. The inspectors also reviewed a sampling of issue reports to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations and functionality reviews.

- Issue Report 548250 - Incorrect Valve Specified in Residual Heat Removal System Fill and Vent Procedure; and
- Issue Reports 498825 and 553934 - Unit 2 Control Valve #1 Fast Closure Test Permissive Light Not Lit.

This inspection represents the completion of two inspection samples.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests listed below to verify that the procedures used and test activities completed adequately demonstrated system operability and functional capability. During the procedure review, the inspectors verified that the procedure adequately tested the safety function(s) that may have been affected by the maintenance activity, that the procedural acceptance criteria were

consistent with information in licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test, or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety function(s).

- QCOS 1000-04 - Residual Heat Removal Service Water Pump Operability Test following completion of Work Order 914294 - 1C Residual Heat Removal Service Water Breaker Contingency Troubleshooting;
- QCOS 1400-01 - Core Spray Quarterly Flow Rate Test and QCOS 1400-08 - Core Spray System Power Operated Valve Test following the completion of Work Order 879818 - 2B Core Spray Discharge Relief Valve Replacement;
- QCOS 0010-07 - Equipment External Leakage Test following the completion of Work Order 865381 - Overhaul Control Rod Drive Discharge Motor Operated Valve 2-0302-2B;
- QCOS 6500-10 - Functional Test of Unit 2 Second Level Undervoltage following the completion of planned maintenance on the degraded voltage relays; and
- QCOP 1000-01 - Residual Heat Removal Fill and Vent following the completion of Work Order 890709 - Replace Relief Valve 1-1001-22B.

These activities represent the completion of five inspection samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed and/or reviewed the surveillance tests listed below to verify that the equipment being tested continued to meet the requirements of the Technical Specifications, the Updated Final Safety Analysis Report, and American Society of Mechanical Engineers Code, Section XI. The inspectors also compared the surveillance procedures to established regulations, codes, standards, calculations, and other information to verify that completion of the procedure adequately demonstrated the ability of the tested equipment to perform its function.

- QCOS 6600-26 - Diesel Generator Redundant Unit Start Surveillance;
- QCOS 5600-08 - Turbine Generator Quarterly Testing; and
- QOS 5600-01- Turbine Control Valve Fast Closure Scram Instrumentation Channel Functional Test.

These activities represent the completion of three inspection samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the temporary modification listed below, and the associated 10 CFR 50.59 screening, and compared each against the Updated Final Safety Analysis Report and Technical Specifications. This comparison was performed to verify that the modification did not affect operability, availability, or functionality of the associated system. The inspectors reviewed the temporary modification installation instructions to ensure that the instructions contained the proper modification installation and removal information. The inspectors also reviewed the licensee's temporary modification records to ensure that this procedurally controlled temporary modification was implemented in accordance with the licensee's procedures and regulatory requirements.

- Temporary Modification incorporated into QOS 5600-01, Revision 36 - Turbine Control Valve Fast Closure SCRAM Functional Test performed on November 25, 2006

This activity represented the completion of one inspection sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors selected radiologically significant work areas within radiation areas and high radiation areas in the reactor, radwaste and turbine buildings to determine if radiological controls including surveys, postings and barricades were acceptable. These areas were walked down and surveyed to determine if the prescribed engineering controls were in place, that licensee surveys and postings were complete and accurate, and that air samplers were properly located. This sample was credited in Quad Cities Inspection Report 05000254/2006005; 05000265/2006005, Section 2OS1.2.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's procedures and practices for access to high risk, high dose rate high radiation areas, and to very high radiation areas to determine if workers were adequately protected from radiological overexposure. Discussions were held with radiation protection management concerning high dose rate high radiation areas, and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection. This was done to determine if procedure modifications had substantially reduced the effectiveness and level of worker protection. This sample was credited in Quad Cities Inspection Report 05000254/2006005; 05000265/2006005, Section 2OS1.5.

During plant walkdowns, the posting and locking of entrances to high dose rate high radiation areas, and very high radiation areas were reviewed for adequacy. This sample was credited in Quad Cities Inspection Report 05000254/2006005; 05000265/2006005, Section 2OS1.5.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

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

.1 Inspection Planning and In-Office Inspection

a. Inspection Scope

The inspectors evaluated the licensee's analysis of additional discharge pathways that could occur as a result of spills, leaks, and routine, normal, abnormal or unexpected liquid or gaseous discharges which could have occurred since the last inspection. The inspectors determined if the licensee had records for sampling locations, types of monitoring, and sampling frequencies that would satisfy 10 CFR 20.1501.

The inspectors reviewed the licensee's Radiological Environmental Technical Specifications/Offsite Dose Calculation Manual (RETS/ODCM), a vendor report and new procedure descriptions, and interviewed licensee representatives in order to review the licensee's program for identifying potential contaminated spills and leakage including the

licensee's process for control and assessment of such occurrences. This review along with Inspection Report 05000254/2006005; 05000265/2006005, Section 2PS1.1 represented one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors discussed unmonitored releases with licensee representatives to determine if the licensee had performed an evaluation of the type and amount of radioactive material that was released and the associated projected doses to members of the public. Additionally, for areas where spills, leaks, or other unusual occurrences involving the spread of licensed radioactive material in and around the facility, equipment, or site had occurred, the inspectors determined if these areas were properly documented in the site's decommissioning file, per 10 CFR 50.75 (g). This sample was credited on Quad Cities Inspection Report 05000254/2006005; 05000265/2006005, Section 2PS1.2.

The inspectors reviewed site maps and documentation in order to assess the licensee's understanding of the location and construction of underground pipes and tanks, and storage pools (spent fuel pool) that contained radioactive contaminated liquids. This included the potential for unmonitored leakage of contaminated fluids to the groundwater as a result of degrading material conditions or aging of facilities. The inspectors reviewed the licensee's capabilities, including monitoring wells, for detecting spills or leaks and for identifying groundwater radiological contamination both on site and beyond the owner controlled area including the technical bases for the onsite groundwater monitoring program. Hydrology flow patterns for the site were reviewed and discussed with the licensee, to determine the licensee's understanding of groundwater flow patterns, in the event of a spill or leak of radioactive material, and the estimated pathway of a plume of contaminated fluid both on site and beyond the owner controlled area. This review represented one sample.

Selected monthly, quarterly, and annual dose calculations were reviewed to determine if the licensee had properly calculated the offsite dose from radiological effluent releases and to determine if any annual Technical Specifications/Offsite Dose Calculation Manual (TS/ODCM) (i.e., Appendix I to 10 CFR Part 50 values) were exceeded and, if appropriate, issued a performance indicator report if any quarterly values were exceeded. The source term used by the licensee was reviewed to ensure all applicable radionuclides discharged, within detectability standards, were included. This sample was credited in Quad Cities Inspection Report 05000254/2006005; 05000265/2006005, Section 2PS1.2.

b. Findings

No findings of significance were identified.

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

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most current Annual Environmental Monitoring Reports (2004 and 2005) and licensee assessment results to determine if the Radiological Environmental Monitoring Program (REMP) was implemented as required by the Radiological Environmental Technical Specifications (RETS) and the Offsite Dose Calculation Manual (ODCM). The inspectors reviewed the reports for changes to the ODCM with respect to environmental monitoring and commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, interlaboratory comparison program, and data analysis.

The inspectors reviewed the ODCM and the Annual Reports for 2004 and 2005 to identify environmental monitoring stations and their locations and evaluated licensee self-assessments, audits, and the licensee's vendor laboratory comparison program results. The inspectors reviewed the Updated Final Safety Analysis Report for information regarding the environmental monitoring program and meteorological monitoring instrumentation. The inspectors also reviewed the scope of the licensee's audit program to determine if it met the requirements of 10 CFR 20.1101c.

This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors walked down three of the air sampling stations (>30 percent) and approximately 20 percent of the thermoluminescent dosimeter monitoring stations to determine whether they were located as described in the ODCM and to determine the equipment material condition. This review represented one sample.

The inspectors observed the collection and preparation of a variety of environmental samples including surface water and air. The environmental sampling program was evaluated to determine if it provided data that was representative of the release pathways as specified in the ODCM and that sampling techniques were performed in accordance with station procedures. This review represented one sample.

From direct observations and record reviews, the inspectors determined if the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the annual report, NRC Safety Guide 23, and licensee

procedures. The inspectors determined if the meteorological data readout and recording instruments, including computer interfaces and data loggers at the tower, were operable; that readouts of wind speed, wind direction, delta temperature, and atmospheric stability measurements were available on the licensee's computer system, which was available in the Control Room; and that the system was operable. This review represented one sample.

The inspectors reviewed each event documented in the Annual Environmental Monitoring Report which involved missed samples, inoperable samplers, lost thermoluminescent dosimeters, or anomalous measurements for the cause and corrective actions. The Annual Reports were reviewed for positive sample results (i.e., licensed radioactive material detected above the lower limits of detection) and the licensee's evaluation of the source of this material. This review represented one sample.

The inspectors reviewed the ODCM for significant changes resulting from modifications to the land use census or sampling station changes made since the last inspection. This included a review of technical justifications for changed sampling locations. The inspectors determined if the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment. This review represented one sample.

The inspectors reviewed calibration and maintenance records for five air samplers along with calibration records for radiation measurement (counting room) instrumentation that could be used for environmental sample analysis and was used for the free release of liquids or pourable solids from the radiologically restricted area. This included determining if the appropriate detection sensitivities would be achieved for counting samples, in that the instrumentation could achieve the RETS/ODCM required environmental lower levels of detection limits. The inspectors reviewed quality control data used to monitor radiation measurement instrument performance, and actions that would be taken if indications of degrading detector performance were observed.

The licensee did not perform radio-chemical analyses of REMP samples. The inspectors reviewed a licensee audit of the vendor laboratory that analyzed these samples. Corrective actions for deficiencies identified in the audit were evaluated along with the vendor's interlaboratory comparison program to determine if the vendor's analytical and quality assurance programs were adequate.

The inspectors reviewed quality assurance audit results of the program to determine whether the licensee met the TS/ODCM requirements. This review represented one sample.

b. Findings

No findings of significance were identified.

.3 Unrestricted Release of Material From the Radiologically Restricted Area

a. Inspection Scope

The inspectors observed the access control location where the licensee monitored potentially contaminated material leaving the radiologically restricted area and inspected the methods used for the control, survey, and release of material from this area. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use to determine if the work was performed in accordance with plant procedures. This review represented one sample.

The inspectors determined if the radiation monitoring instrumentation was appropriate for the radiation types present and was calibrated with appropriate radiation sources that represented the expected isotopic mix. The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material and determined if there was guidance on how to respond to an alarm indicating the presence of licensed radioactive material. The inspectors reviewed the licensee's equipment to determine if radiation detection sensitivities were consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination, and HPPOS-221 for volumetrically contaminated material. The inspectors determined if the licensee performed radiation surveys to detect radionuclides that decay via electron capture.

The inspectors reviewed the licensee's procedures and records to determine if the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters such as counting times and background radiation levels. The inspectors determined whether the licensee had established a "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high radiation background area. This review represented one sample.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

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

The inspectors also reviewed corrective action reports related to the REMP that affected environmental sampling and analysis, and meteorological monitoring instrumentation. Staff members were interviewed and documents were reviewed to determine if the

following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This review represented one sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

Cornerstones: Barrier Integrity, Occupational and Public Radiation Safety

.1 Reactor Safety Strategic Area

a. Inspection Scope

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

- Reactor Coolant System Specific Activity

The inspectors reviewed Chemistry Department records and selected isotopic analyses from January through October 2006 to determine if the greatest Dose Equivalent Iodine (DEI) values obtained during those months corresponded with the values reported to the NRC. The inspectors also reviewed selected DEI calculations to determine if the appropriate conversion factors were used in the assessment. Additionally, the inspectors observed a chemistry technician obtain and analyze a reactor coolant sample for DEI to determine if there was adherence with licensee procedures for the collection and analysis of reactor coolant system samples.

This review represented two samples.

b. Findings

No findings of significance were identified.

2. Radiation Safety Strategic Area

a. Inspection Scope

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

- Occupational Exposure Control Effectiveness

The inspectors reviewed data associated with the performance indicator for occupational radiation safety, to determine if indicator related data was adequately assessed and reported during the previous four quarters. The inspectors compared the licensee's performance indicator data with the issue report database, reviewed radiological restricted area exit electronic dosimetry transaction records, and conducted walkdowns of accessible locked high radiation area entrances to determine if the controls in place for these areas were adequate. Data collection and analyses methods for performance indicators were discussed with licensee representatives to determine if there were any unaccounted for occurrences in the Occupational Radiation Safety performance indicator as defined in Revision 4 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline." This review represented one sample.

- Radiological Environmental Technical Specification/Offsite Dose Calculation Manual (RETS/ODCM) Radiological Effluent Occurrences

The inspectors reviewed data associated with the RETS/ODCM performance indicator to determine if the indicator was accurately assessed and reported. This review included the licensee's issue report database to identify any potential occurrences such as unmonitored, uncontrolled or improperly calculated effluent releases that may have impacted offsite dose. The inspectors also reviewed selected gaseous and liquid effluent release data and the results of associated offsite dose calculations generated over the previous four quarters. Data collection and analyses methods for performance indicators were discussed with licensee representatives to determine if the process was implemented consistent with industry guidance in Revision 4 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline." This review represented one sample.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Review of Items Entered into the Corrective Action Program

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

.2 Semi-Annual Review to Identify Trends

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 repetitive equipment and corrective maintenance issues but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1. The review also included issues documented outside the normal corrective action program in system health reports and maintenance rule assessments. The inspectors' review nominally considered the six-month period of June 1 through December 15, 2006, although some examples expanded beyond those dates when the scope of the trend warranted. The inspectors compared and contrasted their results with the results contained in the licensee's latest trending results.

b. Findings

No findings of significance were identified.

.3 Performance of Maintenance Activities without Associated Procedures

a. Inspection Scope

The inspectors interviewed personnel and reviewed procedures to gain an understanding of the circumstances that led to the conduct of maintenance without documented work instructions on two separate occasions. The inspectors also attended meetings and interviewed additional personnel to evaluate how the licensee processed each of these issues through the corrective action program.

b. Findings

Introduction: The inspectors identified a green finding due to the performance of maintenance without documented work instructions on two separate occasions. In one instance, the licensee failed to identify that the agitation of the 2A reactor feedwater pump minimum flow valve solenoid constituted a maintenance activity. As a result, immediate actions were not taken to address this issue.

Description: On the evening of November 25, 2006, operations personnel completed a Unit 2 power reduction to perform routine turbine testing and a control rod sequence exchange. Due to the magnitude of the power reduction, operations personnel were required to secure one of the three operating feedwater pumps. Early on November 26, the operators prepared Unit 2 for the return to full reactor power. These preparations included returning the previously secured feedwater pump to service. While attempting to start the feedwater pump, the operators identified that the minimum flow valve would not open. Operations personnel initiated Issue Report 561980 to document the minimum flow valve's initial failure to open. In addition, the operators documented that the minimum flow valve was subsequently opened by manually agitating the solenoid to the minimum flow valve actuator.

During the week of November 27, the licensee processed Issue Report 561980 through the Station Ownership Committee and the Management Review Committee. The Station Ownership Committee concluded that Issue Report 561980 should be closed to a maintenance work request to ensure that the solenoid was repaired. The Management Review Committee agreed with this conclusion. Neither committee questioned the equipment agitation.

On November 28, the licensee identified that a fuel handling supervisor had adjusted the Unit 1 refueling bridge main hoist emergency break without having a work package or procedure. The licensee initiated Issue Report 562706 and completed a Quick Human Performance Investigation (QHPI). The QHPI results showed that the fuel handling supervisor believed that he was allowed to make the adjustment to the emergency break due to his extensive knowledge of the refueling bridge equipment. In addition, the fuel handling supervisor believed that a work package was not required prior to adjusting the emergency break. This belief directly conflicted with Section 3.0.2 of MA-AA-1000, "Exelon Conduct of Maintenance Manual," which states, "All work on plant structures/systems/components will be performed using appropriate documentation such as Work Orders, Action Requests, or applicable Troubleshooting Process Control Forms." The licensee temporarily suspended all fuel movement activities and revoked the fuel handling supervisor's qualifications. An apparent cause investigation of this issue was ongoing at the conclusion of the inspection period.

In mid-December the inspectors began reviewing both of these issues in more detail. The inspectors were concerned that the licensee had handled these issues in a significantly different manner even though both issues constituted the performance of maintenance without a procedure. The inspectors discussed the minimum flow valve agitation with the operations staff and learned that the agitation consisted of hitting the

solenoid with a flashlight. The inspectors were also told that the agitation was performed to allow Unit 2 to be returned to full power in accordance with the schedule provided to the load dispatcher.

On December 14, 2006, the inspectors discussed the similarities between the fuel handling event and the agitation of the feedwater pump minimum flow valve with the operations manager. During this discussion, the operations manager recognized that many of the same error precursors that had caused or contributed to the fuel handling issue had also played a part in the minimum flow valve agitation. The licensee initiated Issue Report 569583 to document the inspectors concerns. Two days later, operations personnel also identified that OP-AA-108-105, "Equipment Deficiency Identification and Documentation," did not allow equipment to be agitated as a means of maintaining operability. Immediate corrective actions consisted of discussing the issue with all operations personnel and providing guidance that plant equipment was not to be mechanically agitated. The licensee was conducting an additional review of the fuel handling and feedwater minimum flow valve issues at the conclusion of the inspection. Additional corrective actions were likely to be required once the review was complete.

Analysis: The inspectors determined that the performance of maintenance without documented work instructions was more than minor because if left uncorrected, this behavior could lead to the performance of additional, undocumented maintenance activities on both safety-related and non-safety related equipment. In addition, the feedwater minimum flow valve issue was associated with equipment performance attribute of the mitigating systems cornerstone. The issue also impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors conducted a Phase 1 Significance Determination Process Screening and concluded that this issue was of very low safety significance (Green) because the maintenance did not result in a loss of safety function for any system. The inspectors determined that this finding was cross-cutting in the area of human performance (work practices) in that human error prevention techniques were not utilized, the proper documentation of activities did not occur, and personnel proceeded in the face of uncertainty (**FIN 05000254/2006007-01; 05000265/2006007-01**).

Enforcement: No violation of NRC requirements occurred because the refueling bridge and the feedwater pump minimum flow valve were non-safety related components.

4OA3 Event Followup and Notices of Enforcement Discretion (71153)

.1 Inoperable Standby Liquid Control Tank Results in Request for Notice of Enforcement Discretion

a. Inspection Scope

The inspectors reviewed the circumstances which led to the failure to identify that the Unit 1 standby liquid control tank had been inoperable for approximately 2.5 years. This review included interviewing licensee personnel, reviewing corrective action documents, Technical Specifications, and procedures, evaluating the licensee's request for a Notice

of Enforcement Discretion (NOED), observing NOED related work activities and compensatory measures, and evaluating the licensee's root cause efforts.

b. Findings

Introduction: The inspectors identified a Green finding and Non-Cited Violation of Technical Specification 3.1.7 due to the licensee's failure to enter the associated limiting condition for operation upon obtaining information which challenged the continued operability of the Unit 1 standby liquid control tank.

Description: In May 2004 a system engineer discovered a sodium pentaborate deposit near a support for the Unit 1 standby liquid control tank. At the time the system engineer was unable to determine whether the deposit had formed during sodium pentaborate addition activities or because of an active standby liquid control tank leak. The system engineer used his finger to remove the deposit from the tank and observed the area at a later time. The engineer noted that an additional deposit had formed in the same location. Following this discovery, the engineer initiated Issue Report 224131 to document that the Unit 1 standby liquid control tank was leaking.

Over the next 24 hours, Issue Report 224131 went through the corrective action review process. During this process, the following deficiencies occurred:

- The system engineer failed to identify that the standby liquid control tank was an ASME Section XI, Code Class 2 vessel due to a training/knowledge deficiency.
- Two engineering supervisors and the shift manager were knowledgeable of ASME Section XI requirements. However, these individuals failed to recognize that the standby liquid control tank was an ASME Code component.

As a result, the shift manager incorrectly determined that the Unit 1 standby liquid control tank remained operable. Additional details regarding these deficiencies can be found in NRC Inspection Report 05000254/2006017; 05000265/2006017.

Over the next 2.5 years, the system engineer continued to monitor the condition of the Unit 1 standby liquid control tank. No increase in leakage severity was identified. During an October 11, 2006, phone call with an engineering counterpart, the Quad Cities system engineer discussed that the standby liquid control tank was scheduled for repair during the next Unit 1 refueling outage. The counterpart asked several questions regarding the tank repair. During this discussion, the counterpart told the Quad Cities system engineer that the Unit 1 standby liquid control tank was likely an ASME Code vessel.

On October 12, 2006, at approximately 11:00 a.m., the system engineer discussed the Unit 1 standby liquid control tank ASME Code issue with a Quad Cities engineering programs engineer. Much like before, the programs engineer initially assumed that the standby liquid control tank was not an ASME vessel because the tank was vented to atmosphere. However, the programs engineer chose to verify his assumption by checking a drawing. Upon checking the drawing, both the programs engineer and the system engineer determined that the Unit 1 standby liquid control tank was an ASME

Section XI, Code Class 2 vessel. Both individuals also concluded that the Unit 1 standby liquid control tank was inoperable since through-wall leakage of an ASME Code Class 2 vessel was not allowed by the ASME Code. After reaching this conclusion, several meetings were held with multiple individuals to determine whether the tank was truly inoperable.

At 10:36 p.m. on October 12, operations personnel declared the Unit 1 standby liquid control system inoperable due to the leaking tank. Operations personnel entered Technical Specification 3.1.7 which allowed 8 hours to repair the tank. At 6:36 a.m. on October 13, operations personnel entered Technical Specification 3.1.7, Condition C, which allowed an additional 12 hours to repair the tank or place Unit 1 in Mode 3. At approximately 9:00 a.m. on October 13, the licensee requested that the NRC grant an NOED to allow an additional 72 hours to repair the Unit 1 standby liquid control tank. The NRC granted the NOED at 11:38 a.m. on October 13. Over the next 2.5 days, the licensee drained and repaired the standby liquid control tank. The inspectors monitored the licensee's repair efforts and ensured that compensatory measures were implemented as discussed during the NOED conference call. The standby liquid control system was declared operable at 11:22 a.m. on October 15.

Following the repairs, the licensee performed a root cause investigation of this event. The licensee determined that the Unit 1 standby liquid control tank leak was caused by the wetting of grout which contained leachable halogens. This grout was located between the standby liquid control tank supports and the tank wall. Although the grout was from original construction, the grout became wetted during normal operations and created a condition which allowed stress corrosion cracking to develop where the grout contacted the tank wall. The licensee also determined that an incomplete application of technical rigor caused the Unit 1 standby liquid control tank to be incorrectly declared operable in May 2004.

The inspectors reviewed the licensee's root cause report and identified that 11 hours elapsed between the time engineering personnel had information which called the continued operability of the Unit 1 standby liquid control tank into question and when operations personnel formally entered Technical Specification 3.1.7. The inspectors questioned several licensee staff members to determine the reason for the time delay. Based upon the information provided, the inspectors concluded that the time delay occurred due to the licensee's need to have reasonable assurance that the tank was inoperable rather than operable. This directly conflicted with guidance provided in NRC Inspection Manual Part 9900 Technical Guidance, "Operability Determinations and Functional Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety," dated September 29, 2005, which states:

Operability should be determined immediately upon discovery that a structure, system, or component (SSC) subject to Technical Specifications is in a degraded or nonconforming condition. While this determination may be based on limited information, the information should be sufficient to conclude that there is a reasonable expectation that the SSC is operable. If not able to conclude this, the licensee should declare the SSC inoperable. In any case, if the available information is incomplete, the licensee should promptly collect

any additional information that is material to the determination and promptly make an operability determination based on the complete set of information.

The inspectors concluded that the licensee had not immediately entered Technical Specification 3.1.7 upon discovering sufficient information which demonstrated that the Unit 1 standby liquid control tank was inoperable.

Analysis: The inspectors determined that the failure to enter Technical Specification 3.1.7 in a timely manner was more than minor because it resulted in the Technical Specification 3.1.7 Limiting Condition for Operations Action Times being exceeded prior to requesting the NOED. In addition, if left uncorrected, the failure to enter Technical Specifications at the appropriate time could result in delaying actions to ensure continued safe plant operations. The inspectors performed a Phase 1 Significance Determination Process Screening and concluded that this untimely Technical Specification entry was of very low safety significance (Green) because the standby liquid control tank leak did not result in a loss of system safety function. The inspectors determined that this finding was cross-cutting in the area of human performance (decision-making) in that the licensee did not use conservative assumptions in their decision making.

Enforcement: Technical Specification 3.1.7 requires that two standby liquid control subsystems be operable when the reactor is operating in Modes 1 and 2. Technical Specification 3.1.7, Condition B, states that if two standby liquid control subsystems are inoperable, one subsystem must be returned to an operable status within 8 hours. If one standby liquid control subsystem cannot be returned to an operable status within 8 hours, Technical Specification 3.1.7, Condition C, requires that the reactor be placed in Mode 3 within the following 12 hours. Contrary to the above, on October 12, 2006, the licensee delayed entry into Technical Specification 3.1.7 for approximately 11 hours after obtaining information which indicated that both Unit 1 standby liquid control subsystems were inoperable due to a through-wall leak in the Unit 1 standby liquid control tank. As a result, the licensee was unable to demonstrate compliance with Technical Specification 3.1.7, Conditions B and C, within the required limiting conditions for operation action times. However, because this issue is of very low safety significance and has been entered into the corrective action program as Issue Report 568326, the violation is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy (**NCV 05000254/2006007-02**). Corrective actions for this issue included conducting additional reviews of prompt operability documentation and providing feedback to operations and engineering personnel. The licensee was also in the process of developing and implementing guidance to improve the quality and timeliness of operability decisions.

.2 Multiple Issues Result in Wetting of Electrical Switchgear

a. Inspection Scope

The inspectors interviewed personnel and reviewed procedures, control room operating logs, issue reports, and sequence of event recorder reports to determine the events which led to the wetting of a 4160 Volt switchgear.

b. Findings

On November 10, 2006, maintenance personnel were performing activities associated with flushing fire hydrants outside of the protected area. This activity had been ongoing since November 5 and was scheduled for completion on November 10. As part of this activity, the procedure directed the maintenance crew to request that an operator open the service water to fire protection cross tie valve. The opening of this valve ensured that the fire protection header piping remained pressurized during the hydrant flushing activities.

Immediately after opening the hydrant, a maintenance individual identified that he had not requested that operations open the cross tie valve. Upon contacting the control room, the maintenance individual was informed that both fire pumps had auto-started. However, operations personnel directed the maintenance individual to continue with the hydrant flushing. Approximately 15 minutes later, the control room began receiving alarms and reports that water was spraying into the Unit 2 turbine building. This concerned the Unit 2 operating crew because the water was also wetting the switchgear that supplied power to multiple feedwater pumps and a reactor recirculation pump. Although electrical grounds were received, Unit 2 remained stable throughout the water spraying event. However, several hours were needed to dry out the wetted equipment and clear the electrical grounds.

The licensee's initial investigation determined that the maintenance crew had failed to request that operations open the service water to fire protection cross-tie valve. However, several other items (currently under review) may have contributed to this event. Specifically:

- The water entered the Unit 2 turbine building via a flanged connection for the Transformer 21 fire protection deluge system. It appears the flange gasket may have been installed incorrectly.
- Two fire protection system relief valves may not have operated as designed. The licensee estimated that the fire protection system pressure reached 200 psig during the auto-start of both fire pumps. Relief valves at the discharge of both pumps were designed to actuate at 175 psig in order to limit the fire header piping pressure to 175 psig. Based upon the data available, it appeared that one or both relief valves failed to operate as expected.
- The current Quad Cities fire protection system design allows for the simultaneous auto-start of both pumps. However, Section 9-5.2.3 of NFPA 20, 1976 Edition, does not allow for the simultaneous start of multiple fire pumps. Although the licensee was searching for documentation that allowed a deviation from Section 9-5.2.3 of NFPA 20, none had been found.

At the conclusion of the inspection period, the inspectors had several unanswered questions regarding the causes of and contributors to this event. Based upon the unanswered questions, the inspectors determined that this item should be unresolved pending a review of the licensee's final root cause investigation report and additional interviews with licensee personnel (**URI 05000265/2006007-03**).

.3 (Closed) Licensee Event Report 50-254/06-003-01: Unexpected Start of the Division II Emergency Diesel Generator Due to Open Test Switch

In September 2006, the inspectors identified concerns regarding the thoroughness of information provided in several Licensee Event Reports. Specifically, the inspectors identified that several event reports (including the one listed above) lacked information regarding human performance issues which contributed to the event. Pages 101 and 102 of NUREG-1022, Revision 2, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," provided guidance on the human performance related information licensee's were required to address within a Licensee Event Report. The inspectors provided the NUREG pages to the licensee for review. After reviewing the NUREG pages, the licensee initiated Issue Report 535370 to document the inspectors concern.

On November 20, 2006, the licensee revised Licensee Event Report 50-254/06-003 to ensure that the report included the human performance aspects associated with the unexpected emergency diesel generator start. This event was discussed in detail in NRC Inspection Report 05000254/2006006; 05000265/2006006. The inspectors reviewed the revised event report and concluded that the human performance information which was determined to be missing in September 2006 had now been included. No new issues were identified during the inspectors review of the revised event report.

.4 (Closed) Licensee Event Report 50-254/06-004: Through-wall Leak in Standby Liquid Control Tank Due to the Original Construction Use of Grout with Leachable Halogens

The details of this event were provided in Section 4OA3.1 of this inspection report. No other issues were identified.

4OA5 Other Activities

(Closed) Temporary Instruction 2515/169: Mitigating Systems Performance Index Verification

a. Inspection Scope

During the inspection period, the inspectors performed activities associated with verifying that the licensee had correctly implemented the Mitigating Systems Performance Index (MSPI) guidance for reporting the unavailability and unreliability of the following monitored safety systems.

- High Pressure Coolant Injection (Units 1 and 2);
- Reactor Core Isolation Cooling (Units 1 and 2);
- Emergency Diesel Generators (Units 1, 2, and ½);
- Residual Heat Removal (Units 1 and 2); and
- Residual Heat Removal Service Water (Units 1 and 2).

The inspection included a review of the licensee's control room logs, issue reports, short duration time clock records, and maintenance rule information to determine the baseline

unavailability of each of the monitored systems. This information was then compared to the baseline unavailability provided in the licensee's MSPI Bases Document.

After determining the baseline unavailability, the inspectors used the information in the MSPI Bases Document to determine those surveillance activities which the licensee credited as short duration activities or activities that could be recovered by operator action. In each case, the inspectors reviewed the surveillance procedure and historical completion times to ensure that each surveillance activity met the requirements provided in Nuclear Energy Institute Document 99-02, Revision 4, "Regulatory Assessment Performance Indicator Guideline." Lastly, the inspectors reviewed a sample of control room operating logs, issue reports, and maintenance rule information from 2005 and 2006 to determine the actual planned and unplanned unavailability for each system. This information was used to tabulate the actual failure data for each monitored system or component. The inspectors then compared their tabulated unavailability and unreliability information to the data reported by the licensee as part of the Consolidated Data Entry process. The inspectors also confirmed that none of the monitored systems performance limits were exceeded.

b. Findings

No findings of significance were identified. While performing activities associated with verifying the baseline planned unavailability, the inspectors learned that the licensee had instituted a change in maintenance philosophy for three of the five monitored systems. However, information justifying the maintenance philosophy change was not included in the MSPI Bases Document. During the inspection, the inspectors were provided with written justification for the philosophy change. This was provided to the regional MSPI contact and determined to be acceptable. One minor problem was identified with the licensee's documentation of actual residual heat removal unavailability hours for 2005 and 2006, but this problem did not result in an MSPI color change.

Based upon the sample selected, the inspectors determined that the licensee had accurately documented and reported the actual MSPI unreliability data for each monitored component. As a result, no significant errors were identified which resulted in an MSPI color change.

Lastly, the inspector did not identify any significant discrepancies with the licensee's MSPI Bases Document. However, the inspectors identified several minor discrepancies associated with the surveillance activities credited as short duration or operational recovery activities. Specifically, some of the activities credited by the licensee did not have proceduralized recovery actions or the recovery actions were determined to be complicated in nature. In addition, the licensee had included the unavailability time for multiple short duration and operational recovery activities in their reported MSPI data even though the MSPI Bases Document stated that the licensee would not be including this time in the MSPI data reported to the NRC. Since the licensee had included this unavailability information in their previous MSPI data submittals, no performance indicator color changes were identified. The licensee initiated several issue reports due to the inspector identified MSPI Bases Document discrepancies. A list of these issue reports was included in the List of Documents Reviewed attached to this inspection report. The licensee planned on resolving the MSPI Bases Document issues described

above by January 2007. The inspectors planned to review the updated MSPI Bases Document during the 2007 Performance Indicator Review.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. T. Tulon and other members of licensee management at the conclusion of the inspection on January 9, 2007. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Annual NRC Licensed Operator Requalification examination with Mr. R. Gaylord, Acting Training Manager, on December 5, 2006, via telephone;
- Access control to radiologically significant areas program, with Mr. K. Ohr on November 29, 2006; and
- RETS/ODCM radiological effluents, with Ms. V. Neels on November 30, 2006.
- The heat sink biennial inspection with D. Barker and other members of licensee management at the conclusion of the inspection on December 22, 2006.

ATTACHMENT: SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT**

Licensee personnel

T. Tulon, Site Vice President
R. Gideon, Plant Manager
R. Armitage, Training Manager
D. Barker, Work Control Manager
W. Beck, Regulatory Assurance Manager
D. Craddick, Maintenance Manager
R. Gaylord, Acting Training Manager
S. Kirkland, Chemistry Supervisor
D. Moore, Nuclear Oversight Manager
K. Moser, Engineering Manager
V. Neels, Chemistry/Environ/Radwaste Manager
K. Ohr, Radiation Protection Manager
R. Svaleson, Operations Manager
A. Williams, Radiation Protection Supervisor
J. Potts, GL 89-13 Program Owner
S. Mueller, Service Water System Engineer

Nuclear Regulatory Commission personnel

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

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000254/2006007-01 05000265/2006007-01	FIN	Performance of Maintenance Activities Without a Procedure
05000254/2006007-02	NCV	Failure to Enter Technical Specification 3.1.7 in a Timely Manner
05000265/2006007-03	URI	Review of Switchgear Wetting Event and Associated Fire Protection Issues

Closed

05000254/2006007-01 05000265/2006007-01	FIN	Performance of Maintenance Activities Without a Procedure
05000254/2006007-02	NCV	Failure to Enter Technical Specification 3.1.7 in a Timely Manner
05000254/06-003-01	LER	Unexpected Start of the Division II Emergency Diesel Generator Due to Open Test Switch

05000254/06-004-00 LER Through Wall Leak in Standby Liquid Control Tank
Due to the Original Construction Use of Grout with
Leachable Halogens

Temporary Instruction TI Mitigating Systems Performance Index Verification
2515/169

Discussed

None.

LIST OF DOCUMENTS REVIEWED

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

1R01 Adverse Weather

Work Order 971187; 1C Traveling Screen has Sheared its Shear Pin; dated November 8, 2006
QCOP 4400-18; Traveling Screen Shear Pin Replacement; Revision 2
QCMPM 4400-12; Circulating Water Intake Bay Inspection; Revision 8
QCMPM 4400-01; Traveling Screen Preventive Maintenance; Revision 16
VTIP C0310; Traveling Screen Vendor Manual
Issue Report 501117; 1C Traveling Screen Sheared its Shear Pin; dated June 18, 2006
Issue Report 551239; 1C Traveling Screen Shear Pin Sheared; dated October 31, 2006
Issue Report 553109; 1C Traveling Screen Sheared a Solid Pin; dated November 3, 2006
Issue Report 555355; 1-4402-C Traveling Screen Foreign Material; dated November 8, 2006
Issue Report 555677; NRC Observations 1C Traveling Screen; dated November 9, 2006
Cause Determination Report 501117-02; Functional Failure Cause Determination Evaluation for Function Z4000-01; dated September 18, 2006
Issue Report 425850; MCC 15-3 A1 Tripped Repeatedly During QCOS 3300-02; dated November 19, 2005
Issue Report 557061; CST Heater Bank #1 Shorted to Ground; dated November 13, 2006
Calculation QDC-3300-M-0211; CST Heat Loss and Time-Temperature Response Under Various Scenarios; Revision 1

1R04 Equipment Alignment

QOM 2-0300-01; Unit 2 CRD Valve Checklist; Revision 11
QCOP 0300-01; CRD System Startup; Revision 17

1R05 Fire Protection

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

1R07 Heat Sink Performance

QDC-5700-M-0806, ECCS Calculation Under Design Basis and Degraded Conditions; dated September 13, 2006
Issue Report 193982; 1B Core Spray Room Cooler failed QCOS 5750-09; dated January 8, 2004
Issue Report 211901; OOT, (1-5703-175 84); dated March 30, 2004
Issue Report 234324; Hanger on 1B Core Spray Room Cooler Found With Slight Damage; dated September 7, 2004
Issue Report 258142; Problems During 1B Core Spray Room Cooler PM; dated September 29, 2004

Issue report 358549; Flow Indicator Appears to be Plugged During QCOS 5750-09; dated August 1, 2005
Issue Report 571916; Typos in Calculation QDC-5700-M-0806; dated December 21, 2006
Quad Cities Station GL 89-13 (Safety Related Service Water) Program Self-Assessment; dated November 7, 2006
CONAM Job No. L3217-402; Eddy Current Report of 1B Core Spray Room Cooler; dated September 4, 1999
Generic Letter 89-13 Inspection/Testing Schedule
Generic Letter 89-13 Piping UT Predefines
Generic Letter 89-13 Service Water Pumps Flow Trends
Quad Cities Generic Letter 89-13 Heat Exchanger Tube Plugging Data
Quad Cities Station Raw Water Piping NDE Locations Results
Specification Sheet 6-19-68; Core Spray Emergency Cooler; dated November 8, 1968
CY-AA-120-410; Circulating/Service Water Chemistry; Revision 1
CY-AA-120-4110; Raw Water Chemistry Strategic Plan; Revision 1
CY-AA-120-4200; Corrosion Monitoring Guidelines; Revision 0
CY-QC-110-640; NPDES Temperature and Flow Determination; Revision 4
ER-AA-340; GL 89-13 Program Implementing Procedure; Revision 3
ER-AA-340-1001; GL 89-13 Program Implementation Instructional Guide; Revision 5
Generic Letter 89-13 Program Basis Document; Revision 2
QCCP 0700-17; Environmental Temperature Monitoring Program; Revision 7
QCMPM 5700-01; Emergency Air Handling Unit Maintenance and Inspection (ECCS Room Coolers); Revision 19
QCOA 0010-14; Lock and Dam No.14 Failure; Revision 10
QCOP 0010-01; Winterizing Checklist; Revision 34
QCTP 0820-10; Heat Exchanger and Room Cooler Inspection; Revision 4
WO 320014-01; Heat Exchanger Inspection Report for Unit 1 Emergency Diesel Generator Heat Exchanger 'A'; dated November 14, 2002
WO 455806; Heat Exchanger Inspection Report for 2B Core Spray Room Cooler; dated December 8, 2003
WO 481510; Heat Exchanger Inspection Report for Unit 2 Emergency Diesel Generator Heat Exchanger 'B'; dated February 28, 2004
WO 530617; Heat Exchanger Inspection Report for 1B Core Spray Room Cooler; dated September 27, 2004
WO 598762-01; Heat Exchanger Inspection Report for Unit 1 Emergency Diesel Generator Heat Exchanger 'A'; dated March 28, 2005
WO 674177-01; Eddy Current Examination Final Report for Core Spray/1-5748-A; dated March 26, 2005
WO 737929; Heat Exchanger Inspection Report for Unit 2 Emergency Diesel Generator Heat Exchanger 'B'; dated April 3, 2006
WO 763570; Heat Exchanger Inspection Report for 2B Core Spray Room Cooler; dated April 5, 2006
WO 825509; RHR Service Water Bay Inspection-Both Screens; dated November 4, 2005
WO 828935; Intake Canal Sounding Readings; dated May 5, 2006
WO 904049; RHR Service Water Bay Inspection-Both Screens; dated July 21, 2006
WO 968727; ECCS Room and DGCWP Cubicle Cooler DP Test; dated November 20, 2006
WO 972642; ECCS Room and DGCWP Cubicle Cooler DP Test; dated November 29, 2006
WO 99152503; Heat Exchanger Inspection Report for 1B Core Spray Room Cooler; dated January 2, 2002

1R12 Maintenance Effectiveness

Maintenance Rule Performance Criteria for Function Z4000; dated November 24, 2006
Maintenance Rule Evaluation History for Function Z4000; dated November 24, 2006
Issue Report 444295; Service Water Strainer Diverters not Shifting and Strainers Have High Differential Pressure; dated January 1, 2006
Issue Report 460357; 1A Traveling Screen had Dual Indication While Running; dated March 1, 2006
Issue Report 460615; Cause Determination Eval Changes After MRC Presentation; dated March 1, 2006
Issue Report 471271; 2D Traveling Screen Breaker Tripped; dated March 27, 2006
Issue Report 492907; 1E Traveling Screen Breaker Trips and After Reset; dated May 23, 2006
Issue Report 501117; 1C Traveling Screen Sheared its Shear Pin; dated June 18, 2006
Issue Report 512119; 2A Traveling Screen Failed to Start; dated July 22, 2006
Issue Report 553109; 1C Traveling Screen Sheared a Solid Pin; dated November 3, 2006
Issue Report 553228; 1A Traveling Screen Motor Cable Pull Box Needs Inspection; dated November 3, 2006
Issue Report 555677; NRC Observations on 1C Traveling Screen; dated November 9, 2006

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

Work Week Safety Profiles
Daily Production Risk Schedules
Completed Risk Factor Charts for specified periods
Issue Report 543422; Boron Crystals Forming Near Unit 1 Standby Liquid Control Tank Base Support; dated October 12, 2006

1R15 Operability Evaluations

Issue Report 548250; Incorrect Valve Specified in Residual Heat Removal Fill and Vent Procedure; dated October 24, 2006
QCOS 1000-01; RHR Fill and Vent; Revision 13
M-81; Diagram of Residual Heat Removal Piping; Revision BN
M-3136; Inservice Inspection Isometric Residual Heat Removal System; Revision F
50.59 Screening QC-S-2006-0135; QOS 5600-01 Turbine Control Valve Fast Closure SCRAM Instrumentation Channel Functional Test; dated November 22, 2006
Engineering Change 363550; Review of Revision 36 to QOS 5600-01 for Assurance of Temporary Configuration Change Requirements; dated November 22, 2006

1R19 Post Maintenance Testing

QCOS 1000-04; RHR Service Water Pump Operability Test; dated May 25, 2006
Issue Report 493816; 1C RHRSW Breaker Failure; dated May 25, 2006
QCMMS 1500-01; IST Relief Valve Setpoint Testing; Revision 28
Issue Report 562677; LPCI Loop Relief Valve Leakage During Return to Service; dated November 28, 2006
Issue Report 562850; Delay Encountered on Fill and Vent of Residual Heat Removal During Return to Service; dated November 29, 2006

Technical Specification and Bases

Licensee Event Report 50-265/00-05; High Pressure Coolant Injection Failure to Start during Low Pressure Testing due to Incomplete Maintenance Activities; dated March 8, 2000
Piping and Instrumentation Diagram M-39, Sheet 1; Diagram of Residual Heat Removal Piping; Revision BN
Work Order 812223; Degraded Voltage Relay Routine; dated October 31, 2006
Work Order 754330; Unit 2 Emergency Diesel Generator Time Delay Relay Calibrations; dated October 31, 2006
Issue Report 551694; Unit 2 Emergency Diesel Generator Output Breaker Tripped During QCOS 6500-10; dated November 1, 2006
Issue Report 551825; Delay in QCOS 6500-10 for Bus 24-1; dated November 1, 2006
Issue Report 552696; Stellite Worn Through Need New Valve; dated November 2, 2006
Issue Report 552817; Control Rod Drive Pressure Changes During Minimum Flow Isolation Valve Manipulations; dated November 3, 2006

1R22 Surveillance Testing

QCOS 6600-26; Diesel Generator Redundant Unit Start Surveillance; Revision 21
Issue Report 560896; Followup to Unit 2 #5 CIV Failure to Close; dated November 21, 2006
Issue Report 502689; Main Turbine Intercept Valve did not Fast Close; dated June 22, 2006
Issue Report 562315; Unit 2 #5 Intercept Valve Failed to Fast Close During Surveillance Testing; dated November 27, 2006
Work Order 766151-03; Contingency Plan for Failure of Turbine Control Solenoid Valve to Stroke; dated November 27, 2006
Work Order 951978-01; Turbine Generator Testing; dated November 26, 2006
MA-AA-716-004; Conduct of Troubleshooting; Revision 5
Licensee Event Report 50-341/98-001; Automatic Reactor Scram due to Turbine Trip; dated March 3, 1998

1R23 Temporary Modifications

50.59 Screening QC-S-2006-0135; QOS 5600-01 Turbine Control Valve Fast Closure SCRAM Instrumentation Channel Functional Test; dated November 22, 2006
Engineering Change 363550; Review of Revision 36 to QOS 5600-01 for Assurance of Temporary Configuration Change Requirements; dated November 22, 2006
QOS 5600-10; Turbine Control Valve Fast Closure SCRAM Functional Test; dated November 25, 2006

2OS1 Access Control to Radiologically Significant Areas

RP-QC-460-1002; High Radiation Area Inspections; Revision 0
RP-AA-460; Controls For High & Very High Radiation Areas; Revision 10
Issue Report 525944; Electronic Dosimeter Reset Condition; dated August 30, 2006
Issue Report 553422; ED Rate Alarm Exceeded; dated November 4, 2006
Issue Report 512848; Radiation Survey Needed For Changing Conditions In RW Truck Bay; dated July 25, 2006

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems Program

Potentiometric Surface Contours - Intermediate Groundwater Zone; dated May 2006
Quad Cities Plant Design Analysis Report, Volume 1; dated May 25, 1966
Hydro-geologic Investigation Report, Conestoga Rovers Associates; 2006

2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Programs

Annual Radiological Environmental Operating Report (2005); dated May 12, 2006
Annual Radiological Environmental Operating Report (2004); dated May 13, 2005
RETS LLD Determination For Tritium And Liquid Gross Alpha/Beta Analyses
Liquid Sample Environmental LLD Determinations For 2006
NUPIC Audit 19238 Environmental Inc.; dated January 18, 2006
Selected Monthly Reports, Meteorological Monitoring Program January-September 2006
Offsite Dose Calculation Manual
Air Pump Maintenance Data; March-November 2006
Radiochemistry Cross Check Data For 2006
NOSA-QDC-06-04; Chemistry, Radwaste, Effluent & Environmental Monitoring Program Audit Report; dated May 3, 2006
NOSA-QDC-05-08; ODCM, REMP, Effluent & Environmental Monitoring NOS Audit; dated November 8, 2005
RP-AA-503; Unconditional Release Survey Method; Revision 0
RP-AA-300-1002; Electron Capture Isotope Control; Revision 0
Issue Report 354418; REMP Particulate Filter Ripped While Being Replaced; dated July 15, 2005
Issue Report 426761; REMP Sample Pump Field Check Not Performed As Scheduled; dated October 14, 2005
Issue Report 439410; 912-4 Panel Met Instruments Do Not Work; dated January 1, 2006
Issue Report 428903; REMP Sample Pump Degraded; dated November 25, 2005
Issue Report 450458; Computer Point R235 Met Tower Temperature Reading 20 Degrees Low; dated February 6, 2006
Issue Report 460922; REMP Air Sample Not Collected Due To Failed Quick Connect; dated February 17, 2006
Issue Report 480342; REMP TLD Results Outside Expected Range; dated December 31, 2005
Tennelec Alpha/Beta Calibration Data; dated December 9, 2005
Calibration Data - Germanium Detectors 1, 2, 3, 4; dated November 18, 2005

4OA1 Performance Indicator Review

Dose Equivalent Iodine Data; January Through October 2006
Noble Gas: Beta-Gamma Radiation; I-131 and Tritium data; January-September 2006
Performance Indicator Summary Data; October 2005 Through September 2006
Liquid Radwaste Discharge Package; dated May 25, 2006
Gaseous Release Permit; Main Chimney 2005444; dated December 5, 2006
Gaseous Release Permit; Reactor Vent 2005446; dated December 5, 2006
Occupational PI Data: Access Control Transactions for 2006

4OA2 Problem Identification and Resolution

Issue Report 562706; Adjustment to Unit 1 Refuel Bridge Without Work Order; dated November 27, 2006
Issue Report 570304; Ops Policy Differs From OP-AA-108-105; dated December 16, 2006
Issue Report 569583; NRC Challenge of Operations Work Practice; dated December 14, 2006
Issue Report 561980; 2A Reactor Feedwater Pump Minimum Flow Valve Failed to Open During Feedwater Pump Startup; dated November 26, 2006
Operational Decision Making Document 06-025; 2A Reactor Feedwater Pump Minimum Flow Valve Solenoid; dated December 5, 2006

4OA3 Event Followup

Issue Report 543422; Boron Crystals Forming Near Unit 1 SBLC Tank Base Support; dated October 12, 2006
Issue Report 569581; Issues with SBLC Root Cause; dated December 14, 2006
Issue Report 568326; NRC Questions on SBLC ASME Tank Leak Issue; dated December 12, 2006
Issue Report 568331; NRC Questions on SBLC ASME Tank Leak Issue; dated December 12, 2006
Issue Report 568329; NRC Questions on SBLC ASME Tank Leak Issue; dated December 12, 2006
Work Order 792601-01; Repair SBLC Tank Weld; dated October 14, 2006
TIC 1589; Add Steps to QCOP 1100-03 to Drain SBLC Tank Using Portable Storage Tanks; dated October 13, 2006
Quad Cities Root Cause Investigation Report 543422-05; Standby Liquid Control Unit 1 Declared Inoperable due to Through Wall Leak; dated November 20, 2006
Quick Human Performance Investigation 556335-02; Failure to Follow Work Order Instructions Resulting in an Unplanned Auto Start of the Diesel Driven Fire Pumps; dated November 13, 2006
Issue Report 559376; Sequential Fire Pump Start - Code Compliance; dated November 17, 2006
Issue Report 556179; Water Spraying Full Stream From Flange; dated November 10, 2006
Issue Report 556335; MMD Did Not Request Operations Open Service Water Crosstie; dated November 10, 2006
Issue Report 556430; Diesel Fire Pump Relief Valve Setpoint/Capacity; dated November 10, 2006
Issue Report 556256; 125 Vdc Battery Ground Alarm; dated November 10, 2006
Issue Report 556267; Spurious Alarms Received Due to Water on Bus 21; dated November 10, 2006

4OA5 Other

Issue Report 546241; Errors Noted in RHR/RHRSW Data Entry; dated October 19, 2006
Issue Report 543195; QCOS 6600-20 Procedural Deficiency; dated October 11, 2006
Issue Report 543310; MSPI Bases Document Discrepancy - NRC Identified; dated October 11, 2006
Issue Report 556405; MSPI Indicator Data and Bases Document; dated November 10, 2006

Issue Report 556617; Issues Found with MSPI Basis Document During NRC Inspection; dated November 11, 2006
Nuclear Event Report NC-06-017; Mitigating Systems Performance Index Implementation Errors; dated November 2, 2006
Consolidated Data Entry MSPI Derivation Report; dated October 26, 2006
Consolidated Data Entry Information for July 2005
Consolidated Data Entry Information for October 2005
Consolidated Data Entry Information for January 2006
Consolidated Data Entry Information for February 2006 (HPCI and RCIC only)
Consolidated Data Entry for May 2006
Control Room Operating Logs for July 2005, October 2005, January 2006, February 2006, and May 2006

LIST OF ACRONYMS USED

AR	Action Request
AT	Action Tracking
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DBD	Design Basis Document
DEI	Dose Equivalent Iodine
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
ESW	Emergency Service Water System
IMC	Inspection Manual Chapter
IR	Issue Request
MSPI	Mitigating Systems Performance Index
MOD	Modification
NCV	Non-Cited Violation
NDE	Non Destructive Examination
NOED	Notice of Enforcement Discretion
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
QHPI	Quick Human Performance Investigation
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Environmental Technical Specifications
RHR	Residual Heat Removal
SDP	Significance Determination Process
SSC	Structure, System or Component
TS	Technical Specifications
UT	Ultrasonic Testing
WO	Work Order