October 28, 2005

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 05000254/2005005;
05000265/2005005

Dear Mr. Crane:

On September 30, 2005, 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 October 4, 2005, with Mr. 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, the inspectors identified four issues of very low safety significance (Green). Each of these issues involved violations of NRC requirements. However, because these violations were of very low safety significance and because the issues were entered into the licensee's corrective program, the NRC is treating these findings and issues as Non-Cited Violations in accordance with Section V1.A.1 of the NRC's Enforcement Policy.

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

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

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000254/2005005; 05000265/2005005
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

DOCUMENT NAME: G:\quad\ML053050092.wpd

To receive a copy of this document, indicate in the box:"C" = Copy without enclosure "**E**"= Copy with enclosure"**N**"= No copy

OFFICE	RIII	E						
NAME	MRing:sls							
DATE	10/28/05							

OFFICIAL RECORD COPY

ADAMS Distribution:
GYS
GFD
RidsNrrDipmlipb
GEG
KGO
KKB
CAA1
C. Pederson, DRS (hard copy - IR's only)
DRPIII
DRSIII
PLB1
JRK1
ROPreports@nrc.gov (inspection reports, final SDP letters, any letter with an IR number)

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-254; 50-265
License Nos:	DPR-29; DPR-30
Report No:	05000254/2005005; 05000265/2005005
Licensee:	Exelon Nuclear
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	July 1 through September 30, 2005
Inspectors:	K. Stoedter, Senior Resident Inspector M. Kurth, Acting Senior Resident Inspector A. Barker, Acting Resident Inspector R. Smith, Acting Resident Inspector J. House, Senior Radiation Specialist L. Ramadan, Reactor Engineer R. Ganser, Illinois Emergency Management Agency
Approved by:	M. Ring, Chief Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000254/2005005, 05000265/2005005; 07/01/2005 - 09/30/2005; Quad Cities Nuclear Power Station, Units 1 & 2; Operability Evaluations, Surveillance Testing, and Event Followup.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on radiation protection and follow-up completion of Temporary Instruction 2515/163. The inspection was conducted by Region III inspectors and the resident inspectors. Four Green findings associated with four Non-Cited Violations (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. Inspector-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Green. In January 2005, a finding of very low safety significance was identified when the licensee discovered that a spurious open circuit on the relaying and metering transformers for the unit auxiliary or the reserve auxiliary transformer could result in a loss of power to the residual heat removal service water system (RHRSW). This finding was determined to be a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III.

  This finding was more than minor because if left uncorrected, the open circuit vulnerability would leave the station susceptible to a loss of the residual heat removal service water system following a loss of offsite power event. This finding was determined to be of very low safety significance because the frequency of the circuit failure was less than 1.0E-6 and because the probability of experiencing a control room fire concurrent with the postulated circuit failure was also significantly low. Corrective actions for this issue included installing a temporary modification to eliminate the vulnerability, reviewing other electrical circuitry for similar vulnerabilities, and designing and installing a future permanent modification. (Section 4OA3.1)

Cornerstone: Mitigating Systems

- Green. In August 2005, a finding of very low safety significance was identified for the failure to adequately implement code case instructions for determining the operability and extent of condition when a pipe flaw was found on the residual heat removal service water system. The failure was determined to be a Violation of 10 CFR Part 50, Appendix B, Criterion III.

  The finding was more than minor because, if left uncorrected, the extent of the piping flaw geometry would not be fully understood due to a lack of inspection that could result in inappropriately concluding that equipment important to safety was operable. The

finding was considered to be of very low safety significance because the licensee was able to verify that the minimum pipe wall thickness of suspect examined areas of the residual heat removal service water piping welds met the functionality requirements for system operability. Corrective actions for this issue included completion of the extent of condition ultrasonic tests and weld repair of the 1D residual heat removal service water pump flaw. (Section 1R15)

- Green. A finding of very low safety significance was identified for the failure to provide adequate instructions for the application of grease as a lubricant to 480 Volt motor control center auxiliary contacts during maintenance, which led to the failure of residual heat removal valve 1-1001-26A to operate during testing on November 22, 2004. The lack of adequate instructions was determined to be a Violation of 10 CFR Part 50, Appendix B, Criterion V.

  The finding was more than minor because, if left uncorrected, degraded grease could be applied during maintenance activities to impact the operability, availability, reliability or safety function of a mitigating system. The finding was considered to be of very low safety significance because the finding did not result in an actual loss of a safety system function. Corrective actions for this issue included the removal of the old Aero Shell 7 grease can from the electrical maintenance shop to prevent its use and the generation of work orders to clean and re-lubricate the CR105X auxiliary contacts where white residue had been identified at various motor control center cubicles during the January through February 2005 inspection. (Section 1R22.1)

- Green. On March 21, 2005, a finding of very low safety significance was identified for failing to follow a maintenance procedure that resulted in the failure of residual heat removal valve 1-1001-26B to operate during testing. The failure was determined to be a violation of 10 CFR Part 50, Appendix B, Criterion V.

  The finding was more than minor because if left uncorrected, this inappropriate maintenance practice would result in hardened grease in other auxiliary contact assemblies impacting the operability, availability, reliability, or safety function of mitigating systems. The finding was considered to be of very low safety significance because the finding did not result in an actual loss of a safety system function. Corrective actions for this issue included replacing the auxiliary contact assemblies in the motor control center cubicle and properly lubricating with Dow Corning 44 grease. (Section 1R22.2)

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period operating at 85 percent power. Unit 1 power levels were restricted to this level pending the resolution of previously identified extended power uprate concerns. On July 24 the licensee received an unexpected main generator over-excitation alarm and manually reduced power to approximately 17 percent. Troubleshooting identified a failed circuit associated with the start-up circuitry and power was returned to 85 percent on July 25. On July 26 power was increased to approximately 90 percent after an interim resolution was reached to operate at increased power levels. On August 5 power was increased to 98 percent after further discussions and an interim resolution was reached to operate at extended power uprate levels. On September 18 a planned load drop was completed for a control rod sequence exchange and turbine valve testing. Power was returned to 98 percent the same day. Unit 1 operated at this power level for the remainder of the inspection period.

Unit 2 began the inspection period operating at 98 percent power. On September 5 a planned down power to 85 percent was completed to perform switch yard metering equipment maintenance. Unit 2 was returned to 98 percent power the same day. Unit 2 operated at this power level for the remainder of the inspection period.

1. REACTOR SAFETY

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

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

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

- Unit 2 residual heat removal system, Train B, when the residual heat removal "A" train was out of service;
- Unit 1 high pressure coolant injection system (HPCI) when the reactor core isolation cooling system (RCIC) was out of service;
- Unit 2B and Unit ½ reactor building closed-loop cooling water system, when the Unit 2A reactor building closed-loop cooling water heat exchanger was out of service; and
- Unit 2 high pressure coolant injection system when the safe shutdown makeup pump system was out of service.

The inspectors utilized the valve and breaker checklists listed at the end of this report to verify that the components were properly positioned and that support systems were lined up as needed. The inspectors examined the material condition of the components and observed equipment operating parameters to verify that there were no obvious deficiencies. The inspectors reviewed outstanding work orders and condition reports associated with each system to verify that those documents did not reveal issues that could affect the equipment inspected. The inspectors also used the information in the appropriate sections of the Updated Final Safety Analysis Report to determine the functional requirements of the systems. These inspections represented the completion of four quarterly samples.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors performed routine walk downs of accessible portions of the following risk significance fire zones or evaluated the significance of the following fire protection issues:

- Review of Issue Report 346431, “Fire Protection Surveillance Not Implemented”;
- Fire Zone 2.0 - Service Building Elevation 623 Feet - Control Room;
- Fire Zone 6.2.B - Unit 2 Turbine Building Elevation 615 Feet 6 Inches “B” Battery Charger Room U-2;
- Fire Zone 6.2.A - Unit 2 Turbine Building Elevation 615 Feet 6 Inches “A” Battery Charger Room U-2;
- Fire Zone 1.1.2.5 - Unit 2 Reactor Building Elevation 666 Feet 6 Inches Standby Liquid Control 4th Floor West;
- Fire Zone 1.1.2.3 - Unit 2 Reactor Building Elevation 623 Feet Mezzanine Level;
- Fire Zone 6.1.A - Unit 1 Turbine Building Elevation 615 Feet 6 Inches “A” Battery Charger Room U-1;
- Fire Zone 6.1.B - Unit 1 Turbine Building Elevation 615 Feet 6 Inches “B” Battery Charger Room U-1; and
- Fire Zone 1.1.1.5 - Unit 1 Reactor Building Elevation 666 Feet 6 Inches Standby Gas Treatment 4th Floor East.

The inspectors verified that transient combustibles were controlled in accordance with the licensee’s procedures. The inspectors observed the condition and placement of fire extinguishers and hoses against the Pre-Fire Plan fire zone maps. The physical condition of accessible passive fire protection features such as fire doors, fire dampers, fire barriers, fire zone penetration seals, and fire retardant structural steel coatings were also inspected to verify proper installation and physical condition. These inspections represented the completion of nine quarterly inspection samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

On September 26, 2005, the inspectors observed an operations crew in the simulator. The scenario consisted of a loss of a reactor protection system bus, mispositioned control rod, loss of main condenser vacuum, and an anticipated transient without a scram condition.

The inspectors evaluated crew performance in the areas of:

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

Crew performance in these areas was compared to licensee management expectations and guidelines as presented in the following documents:

- OP-AA-101-111, “Rules and Responsibilities of On-Shift Personnel”;
- OP-AA-103-102, “Watchstanding Practices”;
- OP-AA-103-104, “Reactivity Management Controls”; and
- OP-AA-104-101, “Communications.”

The inspectors verified that the crews completed the critical tasks listed in the above scenarios. If critical tasks were not met, the inspectors verified that crew and operator performance errors were detected and adequately addressed by the evaluators. The inspectors verified that the evaluators effectively identified crews requiring remediation and appropriately indicated when removal from shift activities was warranted. Lastly, the inspectors observed the licensee’s critique to verify that weaknesses identified during this observation were noted by the evaluators and discussed with the respective crews. This inspection represented the completion of one quarterly sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Implementation (71111.12)

a. Inspection Scope

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

- Feed Pump Ventilation System, and
- Instrument Air System.

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

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

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

- Work Week July 18 - 24, 2005, including routine maintenance and surveillance on Unit 1 high pressure coolant injection system and Unit 2 residual heat removal system;
- July 24, 2005, which included an emergent downpower of Unit 1 due to the indication of a main turbine over-excitation condition;

- Work Week August 8 - 14, 2005, including routine maintenance and surveillance on the Unit ½ emergency diesel generator and the Unit 2 residual heat removal system;
- Work Week August 15 - 21, 2005, including routine surveillance on the Unit 2 high pressure coolant injection system and maintenance on the Unit 2 "A" reactor building closed loop cooling water system;
- Work Week September 11 - 17, 2005, including routine maintenance of the safe shutdown makeup pump and Unit 2 station blackout diesel system; and
- Work Week September 18 - 25, 2005, including preplanned maintenance of the Unit 1 emergency diesel generator and associated diesel generator cooling water pump, and the Unit 2 high pressure coolant injection system.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-Routine Evolutions (71111.14)

a. Inspection Scope

The inspectors reviewed personnel performance during two preplanned non-routine evolutions. Reviews of the planned evolutions, associated procedures, briefings, and contingency plans were observed or evaluated by the inspectors. The inspectors observed and reviewed records of operator performance during the evolutions. Reviews included, but were not limited to, operator logs, pre-job briefings, instrument recorder data, and procedures. The documents listed in the Attachment were used by the inspectors to accomplish the objectives of the inspection procedure.

The inspectors observed the following non-routine evolutions for a total of two samples:

- Unit 1 preplanned power ascension from 2511 Mwth to 2640 Mwth per QCGP 3-1, "Reactor Power Operations," during July 26, 2005; and
- Unit 1 preplanned power ascension from 2640 Mwth to 2940 Mwth (912 Mwe) per QCGP 3-1, "Reactor Power Operations," and QCGP 4-1, "Control Rod Movements and Control Rod Sequence," during August 5, 2005.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

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

- Operability Evaluation 350470-02 - Spurious Indications on 2A Refueling Floor Radiation Monitor;
- Operability Evaluation 360535 - Control Rod Drive H8 High Temperature (Unit 2);
- Operability Evaluation 369760 - Unit 1 "D" RHRSW System Pipe Leak;
- Operability Evaluation 143666 - White Residue Found at 480 Volt MCC Auxiliary Contacts; and
- Operability Evaluation 358549 - 1B Core Spray Room Cooler Low Flow.

The inspectors reviewed the technical adequacy of the evaluation against the Technical Specifications, Updated Final Safety Analysis Report, and other design information; determined whether compensatory measures, if needed, were taken; and determined whether the evaluations were consistent with the requirements of LS-AA-105, "Operability Determination Process." The inspectors also reviewed selected issues that the licensee entered into the corrective actions program to verify that identified problems were being entered into the program with the appropriate characterization and significance. These inspections represented the completion of five inspection samples.

b. Findings

.1 Operability Evaluation 369760 - Unit 1 "D" RHRSW System Pipe Leak

Introduction: The inspectors identified a Green finding for the failure to adequately implement code case instructions for determining the operability and extent of condition when a pipe flaw was found on the residual heat removal service water system. The failure was determined to be a Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the inadequate implementation of the code case. In particular, a full circumference inspection of the flawed piping was not performed as instructed by the code case.

Discussion: On August 4, 2005, a leak was identified on the weld joint between the flange and elbow on the discharge piping of the 1D residual heat removal service water pump. This flaw was observed to be localized with leakage at approximately 0.1 gallons per minute. This leak rate was determined not to impact the ability of the pump to meet its flow requirements and was within the capacity of the residual heat removal service water vault sump pump which can pump at a rate of 8.0 gallons per minute. The size of this flaw was approximately 1/8 inch in diameter and the piping is Class 3 moderate energy. This flaw was similar in location to the previously identified flaw in June 2002 on the 1B residual heat removal service water piping. The licensee determined that operability of the 1D residual heat removal service water pipe flaw was bounded by Engineering Calculation 344968 that was initiated to address the June 2002 flaw on the

1B residual heat removal service water piping. Engineering Calculation 344968 calculated the acceptable maximum flaw to be a through-wall flaw of up to one inch in length when applying Code Case N–513. The licensee concluded that the 1D residual heat removal service water system remained operable based on Engineering Calculation 344968.

The inspectors reviewed Engineering Calculation 344968 to verify the 1D residual heat removal service water system operability basis and the application of Code Case –N513. Code Case N–513 requires that the full pipe circumference at the flaw location shall be inspected to characterize the length and depth of all flaws in the pipe section. Engineering Calculation 344968 provided a determination for the minimum pipe wall thickness; however, the inspectors determined that the evaluation was based on the examination of the bottom-half section of the piping and did not include the full pipe circumference as required by Code Case N–513. The inspectors determined that the failure to adequately implement the code case for the residual heat removal service water pipe leak found in June 2002 (1B residual heat removal service water) and August 2005 (1D residual heat removal service water) was a performance deficiency. Issue Report 369760 was initiated to determine if additional examples of Code Case N–513 were misapplied at the station. At the completion of the inspection the licensee had not concluded its evaluation to determine if additional examples existed.

Once identified, the licensee completed full circumference examinations for suspect locations on the Unit 1 and Unit 2 residual heat removal service water piping as required by the code case. The extent of condition ultrasonic test results verified that the minimum pipe wall thickness of each location measured met the functionality requirements documented in the engineering calculation.

Analysis: The failure to adequately implement code case instructions for determining the operability and extent of condition when a pipe flaw was found on the residual heat removal service water system was determined to be more than minor. This conclusion was based upon the determination that, if left uncorrected, the extent of the piping flaw geometry would not be fully understood due to a lack of inspection and could result in inappropriately concluding that equipment important to safety was operable. This finding also affected the cross-cutting area of Human Performance because members of Design Engineering did not identify the fact that the non-destructive examination report did not include full circumference inspections. The inspectors reviewed Appendix B to Inspection Manual Chapter 0612 and determined that this finding was required to be evaluated by the Significance Determination Process due to its impact on the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors assessed the significance of this finding and concluded that this finding was of low safety significance (Green) because the licensee was subsequently able to verify that the minimum pipe wall thickness of suspect examined areas (full pipe circumference) of the residual heat removal service water piping welds met the functionality requirements documented in the engineering calculation.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall be applied to the delineation of acceptance criteria for inspections and tests. The acceptance criteria for Engineering Calculation 344968 utilized Code Case N–513 which requires inspection of the full pipe circumference at the flaw location.

Contrary to the above, the licensee calculated minimum pipe wall thickness criteria by misapplying the code case instructions when flaws were identified in June 2002 and August 2005 on residual heat removal service water piping. In particular, the licensee failed to perform full circumference examinations as required by the Code Case N–513 of suspect residual heat removal service water piping. The minimum pipe wall thickness measurements were used to support the determinations that the residual heat removal service water systems were operable. Because the Violation was of very low safety significance and the issue was entered into the licensee's corrective action program as Issue Report 369760, it's being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000254/2005005-01; 05000265/2005005-01)**. Corrective actions for this issue include the extent of condition ultrasonic tests that have been completed and the weld repair of the 1D residual heat removal service water pump flaw.

.2 Operability Evaluation 143666 - White Residue Found at 480 Volt MCC Auxiliary Contacts

b. Findings

Additional findings of significance were not identified, however, refer to Section 4OA2 of this report for information regarding Operability Determination 143666 for white residue found at auxiliary contacts.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

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

- Work Order 653413 - ANI Inspection of the 2A Reactor Building Closed-Loop Cooling Water Heat Exchanger;
- Work Order 631172 - Replacement of Unit 1 Diesel Generator Cooling Water Pump;
- Work Order 499665 - Preventive Maintenance on MCC 2B Cubicle for RCIC Pump Torus Suction Valve 2-1301-25; and
- Work Order 502672 - Preventive Maintenance on MCC 2B Cubicle for RCIC Pump Torus Suction Valve 2-1301-26.

For each post maintenance activity selected, the inspectors reviewed the Technical Specifications and Updated Final Safety Analysis Report against the maintenance work package to determine the safety function(s) that may have been affected by the

maintenance. Following this review the inspectors verified that the post maintenance test activity adequately tested the safety function(s) affected by the maintenance, that acceptance criteria were consistent with licensing and design basis information, and that the procedure was properly reviewed and approved. When possible the inspectors observed the post maintenance testing activity and verified that the structure, system, or component operated as expected; test equipment used was within its required range and accuracy; jumpers and lifted leads were appropriately controlled; test results were accurate, complete, and valid; test equipment was removed after testing; and any problems identified during testing were appropriately documented. These inspections represented the completion of four inspection samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed surveillance testing activities and/or reviewed completed surveillance test packages for the tests listed below:

- QCOS 1000-09, RHR Power Operated Valve Test (1-1001-26A Valve);
- QCIS 0010-01 - Strong Motion Accelerometer Recorder Operability Test;
- QCIS 2300-02 - HPCI Reactor Low Pressure Analog Trip System Calibration and Functional Test, QCIS 2300-04 - HPCI Steam Line High Flow Analog Trip System Calibration and Functional Test, and QCOS 2300-05 - Quarterly HPCI Pump Operability Test;
- QCOS 100-09, RHR Power Operated Valve Test (1-1001-26B Valve);
- QCOS 1400-01 - Quarterly Core Spray System Flow Rate Test, and QCOS 1400-08 - Core Spray System Power Operated Valve Test; and
- QCOP 4400-09 - Circulating Water System Flow Reversal.

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

b. Findings

.1 Residual Heat Removal 1-1001-26A Valve

Introduction: A self-revealed Green finding and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," were identified for the residual heat removal "A" loop drywell spray inboard isolation valve 1-1001-26A failing to open when required. Valve operation was being conducted in accordance with procedure QCOS 1000-09, "RHR Power Operated Valve Test." Electrical maintenance inspected Cubicle A1 at 480V MCC 18-1B and found a high resistance reading across an auxiliary contact that was involved in opening the valve. Dried thickener residue from old Aero Shell 7 grease on the sliding surfaces of the auxiliary contact assembly was the primary cause of the high resistance that was measured.

Discussion: On November 22, 2004, the residual heat removal "A" loop drywell spray inboard isolation valve 1-1001-26A failed to open while performing procedure QCOS 1000-09, "RHR Power Operated Valve Test." Electrical maintenance inspected cubicle A1 at 480V MCC 18-1B under Work Order 756290-01. The electricians discovered high resistance of 1.8 mega-ohms across the closed contacts of the right-side auxiliary contact of the closing contactor. These contacts, when closed, serve as the permissive to open the valve in the open contactor circuit. The high resistance prevented the control circuit for open-valve operation from being energized, which precluded the opening of the valve.

When the auxiliary contact was examined, an accumulation of dried white residue was observed on the surfaces of the moving plunger and the stationary channels of the auxiliary contact, where the plunger moves to change contact state. Care was taken to minimize disturbing the as-found condition of the right-side auxiliary contact, but apparently vibration from removing the cubicle bucket caused the resistance across the closed contacts to decrease to 0.26 ohms. This was an expected value for closed contacts.

The right-side auxiliary contact was last replaced on May 13, 2003, with a new auxiliary contact and lubricated with Aero Shell 7 grease. This replacement occurred because the installed auxiliary contact resulted in the failure of Valve 1-1001-26A to open during the performance of procedure QCOS 1000-31, "U-1 'A' Loop LPCI and Containment Cooling Modes of RHRS Non-Outage Logic Test." Inspection of the removed auxiliary contact in May 2003 identified a dirty film that caused a high resistance of greater than 1.0 mega-ohm. Burnishing the contacts reduced the resistance to less than 1.0 ohm. When the right-side auxiliary contact was replaced, the sliding surfaces of the auxiliary contact plunger and channels were cleaned with isopropyl alcohol, and Aero Shell 7 grease was applied in accordance with procedure QCEMS 0250-11, "480/208 VAC Motor Control Center Maintenance and Surveillance." The cause of the valve failing to open in 2003 is different than the cause of the failure in November 2004. In 2003 there was no dried grease observed between the moving plunger and the stationary channels. In November 2004 there was dried grease present causing the auxiliary contact binding that resulted in the valve failing to open.

The residual heat removal “A” loop drywell spray inboard isolation valve 1-1001-26A failing to open on November 22, 2004, occurred 18 months after the previous failure to open. It was unexpected to find that the grease applied to the auxiliary contact assembly had dried to form an accumulation of white residue within 18 months. Previous station experience was that dried grease on auxiliary contacts had been observed after three or more years from time of application.

A review of the materials listed under the work order in 2003 during the installation of the new auxiliary contact had no record of Aero Shell 7 grease being removed from the maintenance storage shop. The licensee discovered that there was a gallon can of old Aero Shell 7 grease stored in a cabinet in the electrical maintenance shop that electricians used on auxiliary contact assemblies in motor control center cubicles. It was concluded that this can of grease was used on the new auxiliary contact that was installed in 2003. A maintenance storage shop label on the can was marked with a date of March 3, 1993, and an inspection of the grease inside the can revealed that the lubricant had separated from the thickener. Since the grease exhibited separation, mostly thickener was used to lubricate the auxiliary contact assembly. This old grease with higher than normal concentration of thickener can dry prematurely. The grease will perform acceptably at first but can lose its lubricating ability with increased time as it dries and leaves a white residue, which was observed with the November 2004 valve failure. The dried thickener residue from old Aero Shell 7 grease on the sliding surfaces between the plunger and channels of the auxiliary contact assembly was the primary cause of the high resistance that was measured across the right-side auxiliary contact. Exelon Power Lab Report QDC-34499 concluded that the Aero Shell 7 grease from the grease can with the 1993 label that was used in 2003 was severely degraded and appeared much older than 18 months.

The inspectors reviewed procedure QCEMS 0250-11, “480/208 VAC Motor Control Center Maintenance and Surveillance” for the instructions to apply grease to the auxiliary contacts. In procedure Section 2.0, “Material and Special Equipment,” Aero Shell 7 grease was listed with its Catalog ID Number 33484. In procedure Section 3.e, the instruction was to apply a thin film of Aero Shell 7 grease along plunger guides for CR105X auxiliary contact maintenance and inspection. Also, within the procedure was a reference to the Catalog ID Number 33484. However, the procedure did not direct the inspection of the Aero Shell 7 grease prior to its use to determine if any lubricant and thickener separation occurred. The lack of procedure guidance was a performance deficiency.

Analysis: The inspectors determined that the lack of procedure instruction in QCEMS 0250-11, “480/208 VAC Motor Control Center Maintenance and Surveillance,” to evaluate Aero Shell 7 grease for lubricant and thickener separation was more than minor. This conclusion was based upon the determination that if left uncorrected, grease in a degraded condition could be applied during maintenance activities to impact the operability, availability, reliability or safety function of a mitigating system. The inspectors reviewed Appendix B to Inspection Manual Chapter 0612 and determined that this finding was required to be evaluated by the Significance Determination Process as it impacted the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent

undesirable consequences. The inspectors assessed the significance of this finding and concluded that this finding was of low safety significance (Green) because the finding did not result in an actual loss of a safety system function.

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires that activities affecting quality be prescribed by documented instructions, procedures, and drawings of a type appropriate to the circumstance. In addition, the activities affecting quality shall be accomplished in accordance with these instructions, procedures, and drawings. Procedure QCEMS 0250-11, "480/208 VAC Motor Control Center Maintenance and Surveillance," was the procedure for providing instruction for performing CR105X auxiliary contact maintenance and inspection by applying a thin film of Aero Shell 7 grease along plunger guides.

Contrary to the above, procedure QCEMS 0250-11, "480/208 VAC Motor Control Center Maintenance and Surveillance," lacked the appropriate guidance to inspect grease prior to its use for lubricant and thickener separation. However, because this violation was of very low safety significance, and because the issue was entered into the licensee's corrective action program as Issue Report 275607, the issue is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000254/2005005-02; 05000265/2005005-02)**. Corrective actions for this issue included the removal of the old Aero Shell 7 grease can from the electrical maintenance shop to prevent its use and the generation of work orders to clean and re-lubricate the CR105X auxiliary contacts where white residue had been identified at various motor control center cubicles during the January through February 2005 inspection.

.2 Residual Heat Removal 2-1001-26B Valve

Introduction: A self-revealing Green finding and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," were identified for the residual heat removal "B" loop drywell spray inboard isolation valve 2-1001-26B failing to close. Valve operation was being conducted in accordance with procedure QCOS 1000-09, "RHR Power Operated Valve Test." Electrical maintenance inspected Cubicle D3 at 480V MCC 29-4 and found a high resistance reading across an auxiliary contact that is involved in closing the valve. The cause of the high resistance across the auxiliary contact is the misapplication of grease to the top ridges of the plunger.

Discussion: On March 21, 2005, the residual heat removal "B" loop drywell spray inboard isolation valve 2-1001-26B failed to close while performing procedure QCOS 1000-09, "RHR Power Operated Valve Test." Electrical maintenance inspected Cubicle D3 at 480V Motor Control Center 29-4 under Work Order 792714-01. The electricians discovered high resistance of 2.0 mega-ohms across the auxiliary contact of the open contactor. This contact should be closed when the valve is open to serve as a permissive for the close contactor to pull in and close the valve. The high resistance prevented the closing coil from energizing to pull in the closing contactor.

A visual inspection of the failed auxiliary contact in the as-found condition found the movable plunger inside the auxiliary contact assembly to be in the fully closed position. The plunger was extended full out in the channels of the auxiliary contact assembly. There was no visual evidence of binding (i.e., plunger in an intermediate or fully open position). A light amount of white residue from the Aero Shell 7 grease was observed inside the channels of the auxiliary contact assembly. The same amount of white residue was observed in the channels of the other non-failed auxiliary contact on the closing contactor.

Exelon Power Labs Report QDC-50271 identified that the light amount of white residue observed in the channels of the auxiliary contact assembly was magnesium silicate thickener of Aero Shell 7 grease. The report noted that the white residue did not contribute to the contact failure because the contact plunger did not exhibit sluggish movement or binding when operated. Also, there were three types of foreign material present on the surfaces of the contacts of the auxiliary contact assembly: 1) silver sulfide, 2) Aero Shell 7 grease, and 3) a small cotton fiber. The contacts had silver sulfide deposits on the outer surfaces of the contacts, which can cause high resistance but significantly less in the area where the contacts met as evidenced by visual examination and low resistance that was observed when the contacts were closed. This was not considered the failure mechanism of the auxiliary contacts. In addition, there was an accumulation of semi-hardened grease on the leading edge of the upper side of the movable contact finger where the contact is mounted. There was Aero Shell 7 grease observed on the underside of the movable contact finger and on the ridge of the top side of the plunger, which moves the flexible contact finger up and down to open and close the contacts. The grease accumulation in these locations caused the high resistance across the contacts. Also, a contributor to the high resistance was the foreign substance of the cotton fiber on the contact surface, which was likely introduced from a cotton-tipped swab used in the cleaning process prior to applying new lubricant.

The grease present on the leading edge of the upper side of the movable contact finger was not supposed to be present at that location. Procedure QCEMS 0250-11, "480/208 VAC Motor Control Center Maintenance and Surveillance," Attachment 1, Section 3.e and Attachment 6 Figure 2 states and illustrates, to apply a thin film of Aero Shell 7 grease along plunger guides. If more than a thin film of grease had been applied to the top ridges of the plunger, it would have transferred to the upper side of the movable contact finger by the scraping action of the leading edge of the finger against the ridge of the plunger, as the plunger moved to the auxiliary contact assembly. The cause for high resistance across the auxiliary contacts is the misapplication of grease to the top ridges of the plunger, which transferred to the upper side of the movable contact finger in the vicinity of the contact, and eventually hardened and became lodged between the surfaces of the contacts. This misapplication of the Aero Shell 7 grease was considered a performance deficiency.

Analysis: The inspectors determined that the misapplication of Aero Shell 7 grease was more than minor. This conclusion was based upon the determination that, if left uncorrected, this inappropriate maintenance practice would result in hardened grease in other auxiliary contact assemblies impacting the operability, availability, reliability or safety function of a mitigating system. This finding also affected the cross-cutting area

of Human Performance because a fundamental maintenance practice of greasing an auxiliary contact assembly resulted in the failure of a plant component. The inspectors reviewed Appendix B to Inspection Manual Chapter 0612 and determined that this finding was required to be evaluated by the Significance Determination Process because it impacted the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors assessed the significance of this finding and concluded that this finding was of low safety significance (Green) because the finding did not result in an actual loss of a safety system function.

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required that activities affecting quality be prescribed by documented instructions, procedures, and drawings of a type appropriate to the circumstance. In addition, the activities affecting quality shall be accomplished in accordance with these instructions, procedures, and drawings. Procedure QCEMS 0250-11, "480/208 VAC Motor Control Center Maintenance and Surveillance," Attachment 1, Section 3.e and Attachment 6 Figure 2 states and illustrates, to apply a thin film of Aero Shell 7 grease along plunger guides.

Contrary to the above, on March 21, 2005, it was self-revealed through testing that the misapplication of Aero Shell 7 grease that eventually hardened, and became lodged between the surfaces of the auxiliary contacts, resulted in the residual heat removal "B" Loop Drywell Spray Inboard Isolation Valve 2-1001-26B failing to close. However, because this violation was of very low safety significance, and because the issue was entered into the licensee's corrective action program as Issue Report 315350, the issue is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000254/2005005-03; 05000265/2005005-03)**. Corrective actions for this issue included replacing the auxiliary contact assemblies in the motor control center cubicle and properly lubricating with Dow Corning 44 grease.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the plant Updated Final Safety Analysis Report to identify applicable radiation monitors associated with transient high and very high radiation areas including those used in remote emergency assessment. These monitors included, but were not limited to:

- Refueling floor High Range Monitor;
- Unit 1 Division 1 Drywell Radiation Monitor;
- Unit 2 Division 2 Drywell Radiation Monitor;

- Unit 2 Division 1 Drywell Radiation Monitor;
- Area Radiation Monitor # 16; and
- Continuous Air Monitor S/N 83-122-21.

This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Identification of Additional Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors identified portable radiation detection instrumentation used for job coverage of high radiation area work along with other temporary area radiation monitors currently in use including continuous air monitors associated with jobs having the potential for workers to receive 50 millirem committed effective dose equivalent. Whole body counters and radiation detection instruments utilized for personnel survey and for release of material from the radiologically controlled area were also identified. This review represented one sample.

b. Findings

No findings of significance were identified.

.3 Calibration and Operability of Radiation Instrumentation

a. Inspection Scope

Portable survey instrument calibration was performed at an offsite Exelon facility. Licensee personnel were observed performing source checks of selected instruments. This included observing detector geometry and evaluation of check sources to determine if station requirements were being met. The inspectors reviewed records of calibration, operability, and alarm set points (where applicable) of selected instruments including containment radiation monitors, portable hand-held survey instruments and personal monitoring devices. This review included, but was not limited to the following:

- Whole Body Counter Calibration;
- Reactor Refuel Floor High Range ARM #2 Calibration;
- Division 1 Drywell Rad Monitor Calibration;
- Area Rad Monitor Calibration;
- Calibration Certificate; AMP 200 Radiation Detector 7704-031;
- Calibration Certificate; RO-20 Radiation Detector 005210;
- Calibration Certificate; RSO-50E Radiation Detector B992M; and
- Calibration Certificate; AMS-4 Radiation Detector 107.

The inspectors evaluated those actions that would be taken when, during calibration or source checks, an instrument was found to be out of calibration by more than 50 percent. Those actions included entering the issue into the corrective action program, an investigation of the instruments' previous usages, and the possible consequences of that use since the last calibration. The inspectors also reviewed the licensee's 10 CFR Part 61 source term analyses to determine if the calibration sources used were representative of the plant source term. This review represented one sample.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, condition reports, and special reports that involved personnel contamination monitor alarms due to personnel internal exposures to determine if identified problems were entered into the corrective action program for resolution. There were no internal exposure occurrences greater than 50 millirem committed effective dose equivalent. However, the licensee's process for investigating this type of occurrence was reviewed to determine if the affected personnel would be properly monitored utilizing calibrated equipment and if the data would be analyzed and internal exposures properly assessed in accordance with licensee procedures. This review represented one sample.

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

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

This review represented one sample.

The inspectors evaluated the licensee's self-assessment activities to determine if they would identify and address repetitive deficiencies or significant individual deficiencies observed in problem identification and resolution. This review represented one sample.

b. Findings

No findings of significance were identified.

.5 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors determined if the calibration expiration and source response check data records on radiation detection instruments staged for use were current and observed radiation protection technicians for appropriate instrument selection and self-verification of instrument operability prior to use. This review represented one sample.

b. Findings

No findings of significance were identified.

.6 Self-Contained Breathing Apparatus Maintenance and User Training

a. Inspection Scope

The inspectors reviewed the status, maintenance and surveillance records of selected self-contained breathing apparatuses staged and ready for use in the plant and inspected the licensee's capability for refilling and transporting self-contained breathing apparatus air bottles to and from the control room and operations support center during emergency conditions. The inspectors determined whether control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of self-contained breathing apparatuses including personal bottle change-out. This included determining if licensee personnel were trained and qualified to refill air bottles. The inspectors also reviewed the training and qualification records for selected (more than three) individuals on each control room shift crew, and selected (more than three) individuals from each designated department that were currently assigned emergency duties including onsite search and rescue. This review represented one sample.

The inspectors reviewed the self-contained breathing apparatus manufacturer's maintenance training certifications for licensee personnel qualified to perform self-contained breathing apparatus maintenance on the vital components (regulator and low pressure alarm). The inspectors identified three self-contained breathing apparatus units currently designated as "ready for service" and reviewed maintenance records of work performed by qualified personnel on this equipment including the vital components, over the past five years. Maintenance records covering the period since the last inspection of this area were reviewed for selected self-contained breathing apparatus units. The inspectors also determined if the required, periodic air cylinder hydrostatic

testing was current and documented, and that the Department of Transportation required air cylinder retest markings were in place for the three identified self-contained breathing apparatus units as well as other selected units. The licensee's maintenance procedures were based on the self-contained breathing apparatus manufacturer's maintenance manuals. The inspectors also observed licensee staff inspect and refill air bottles to verity compliance with those procedures. This review represented one sample.

b. Findings

No findings of significance were identified.

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

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most current Annual Environmental Monitoring Report dated May 13, 2005, and licensee assessment results to determine if the radiological environmental monitoring program was implemented as required by the RETS/ODCM. The inspectors reviewed the report for changes to the RETS/ODCM with respect to environmental monitoring and commitments in terms of sampling locations, monitoring and measurement frequencies, land use census inter-laboratory comparison program, and data analyses. The inspectors reviewed the offsite dose calculation manual for information regarding environmental monitoring locations and evaluated licensee self-assessments , audits, special reports, and inter-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 20.1101(c). This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors visited four air sampling stations to determine whether they were located as described in the offsite dose calculation manual 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 was representative of the release pathways as specified in the offsite dose calculation manual and that sampling techniques were performed accordingly. This review represented one sample.

The inspectors determined if the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the annual report 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. This review represented one sample.

The inspectors reviewed the offsite dose calculation manual for significant changes resulting from land use census modifications, or sampling station changes made since the last inspection. There were none. This review represented one sample.

The inspectors reviewed the calibration and maintenance records for the four air samplers. The inspectors reviewed 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 controlled area. This included verification that 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 inspectors also evaluated the results of the licensee's and the vendor laboratory's inter-laboratory comparison program, to verify the adequacy of radio-chemical analyses performed by these laboratories. The quality assurance organization's evaluation of the intercomparison program, including corrective actions for deficiencies was examined. The inspectors reviewed quality assurance audit results of the program to determine whether the licensee met the Technical Specifications/offsite dose calculation manual 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 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 evaluated the licensee's equipment to determine if radiation detection sensitivities were consistent with the NRC guidance contained in Inspection and Enforcement Circular 81-07 and Inspection and Enforcement 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 if the licensee had established a "release limit" by alerting the instrument's typical sensitivity through such methods as raising the energy discriminator level or by locating the instrument in a low radiation background area. This review represented one sample.

b. Findings

No findings of significance were identified.

.4 Identification and Resolutions of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, licensee event reports, and special reports related to the radiological environmental monitoring program since the last radiological environmental monitoring program 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 deficiencies that were identified by the problem identification and resolution process.

The inspectors also reviewed corrective action reports from the radiological environmental monitoring program 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 NCV's 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

4OA2 Identification and Resolution of Problems (71152)

.1 Review of White Residue Identified on CR105X Auxiliary Contact Assemblies

Introduction

For approximately the last two years the site had identified and assessed the condition of white residue existing on sliding surfaces of CR105X auxiliary contact assemblies and its impact on the equipment's associated safety functions. The CR105X type assembly with Aero Shell 7 lubrication was used throughout the plant at numerous 480 VAC and 208 VAC motor control center cubicles. These auxiliary contact assemblies were also installed on the start contactors used to energize the reactor protection system relays. The contact assemblies function to provide the proper control circuit logic to start and sustain operation of the structures, systems, and components, and to provide required interlock logic for proper sequencing of structures, systems, and components. Also it provides designed indication and annunciator actuation to provide the operator with accurate structure, system, and component status.

The subject auxiliary contact assemblies are typically installed on motor starters (main contactors) at the motor control center cubicles. A mechanical linkage between the motor starter and the auxiliary contact assemblies causes the contacts in the auxiliary contact assemblies to change state as the main contactor is energized and de-energized. Each CR105X contact assembly consists of one contact set that is designed to be configured as normally closed or normally open. The body of the contact assembly is a phenolic type material. A ribbed phenolic slide (plunger) moves through a

channeled section of the assembly body to actuate the contacts. The slide in each auxiliary contact assembly is spring loaded. When the main contactor is energized, the mechanical linkage forces the slide on the auxiliary contact into the body of the assembly to change the contact state and compress the spring. When the main contactor is de-energized, the energy present in the compressed spring forces the slide back out of the assembly to return the contact to the normal state.

The licensee identified white residue on CR105X auxiliary contact assemblies installed in approximately 300 safety related 480 and 208 VAC motor control center cubicles throughout Unit 1 and Unit 2. Twenty three white residue examples were identified in February 2003. Forty white residue examples were identified in January through February 2005. The inspectors observed that of these 40 examples, 5 had been previously identified in February 2003 at cubicles for non-safety related equipment. This white residue was understood to be a magnesium silicate, an inorganic thickener that separates over time from the Aero Shell 7 grease that is used to lubricate the sliding contact surfaces of the auxiliary contact assembly. This residue has been previously documented and understood to be a precursor and/or cause for binding of the sliding surfaces of the auxiliary contact assembly. The resultant binding can adversely affect the operation of the auxiliary contact and it's associated structure, system, and component. As discussed in Section 1R22 of this report, two self-revealing examples of grease (white residue) issues resulted in the inoperability of safety-related equipment.

Inspection Scope

The inspectors reviewed the licensee's Operability Determination 143666 for the identification of white residue existing on the sliding surfaces of CR105X auxiliary contact assemblies and its affect on associated safety functions. Also, the inspectors evaluated the licensee's assessment and actions to address corrective actions associated with the identification of the white residue.

Issues and Findings

The inspectors did not disagree with the conclusions of Operability Evaluation 143666, Revision 4, that determined that the auxiliary contacts with Aero Shell 7 grease applied were considered to be in an operable condition. However, the inspectors did identify several weaknesses. The first weakness was that the operability evaluation did not examine the white residue to understand its formation (e.g., time dependence, temperature influence) to determine a time dependence associated with the degradation. The visual inspections conducted of motor control centers in January through February 2005 categorized the level of white residue that was identified in qualitative terms of heavy, medium or light. However, this data was only used as input to schedule the appropriate maintenance. When Revision 4 of Operability Evaluation 143666 was performed, procedure LS-AA-105, "Operability Determinations," had also been revised to include guidance to determine whether the potential failure was time dependent and whether the condition will continue to degrade and/or will the potential consequences increase. The inspectors determined that the revised operability determination procedure was not implemented for this operability evaluation due to the site's assessment that the revision was an administrative enhancement and that the revision did not impact the operability outcome. Although the outcome of the

operability determination was not affected, the inspectors were concerned that the site did not use the revised operability evaluation procedure instructions. If used, the site would have better insight to determine the time dependence relationship of the white residue and its impact on equipment and system operability, especially considering that the operability evaluation was revised after the revised operability evaluation procedure was implemented.

The remaining weakness was identified by inspectors for a lack of supportive documentation used to determine the operability of the structure, system and component. The licensee's conclusion was based on station experience that the presence of white residue could exist for years without causing auxiliary contact binding. The supportive documentation included five white residue examples that were identified in 2003 and had not yet been cleaned or corrected for at least two years. The inspectors were concerned that the site's conclusion for continued operability was based on this historical evidence that the white residue had existed on the auxiliary contacts for this time period, however, the site had not determined if the auxiliary contacts were exercised to demonstrate continued operability. After discussions with the licensee, the site determined that the components associated with the five examples had varying levels of operation during this time period and no problems were noted. In addition, the engineering staff provided additional evidence that numerous contacts with white residue had been routinely tested and did not fail. The inspectors did not identify additional concerns with the overall conclusion of continued operability based on the additional evidence provided.

The inspectors reviewed the site's preventive maintenance schedule for the use of Dow Corning 44 grease to replace the Aero Shell 7 grease for auxiliary contact lubrication. The licensee provided information from other sites on the favorable use of this grease. The inspectors did not identify additional concerns with the site's schedule and application of the new lubricant.

4OA3 Event Followup (71153)

.1 (Closed) Licensee Event Report 50-254/05-001-00; 50-265/05-001-00: 4160 Volt Relaying and Metering Single Failure Vulnerability.

Introduction: One Green finding and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control were identified due to the failure to establish measures which included provisions to assure that the single failure criterion contained in General Electric NEDO Document 10139 continued to be met following the re-classification of the residual heat removal service water system as safety-related in 1985. As a result, a single failure vulnerability involving spurious open circuits existed which would have resulted in the inability to start the residual heat removal service water system when needed.

Description: On January 27, 2005, the licensee for Crystal River Unit 3 informed the NRC of a design deficiency in which a postulated single failure would have resulted in the loss of all onsite and offsite alternating current power to the safety-related buses. The inspectors discussed this issue with Quad Cities personnel and were informed that a similar issue did not exist at the station. Several days later, Exelon personnel at the

LaSalle Station concluded that they were vulnerable to a similar single failure due to a spurious open circuit. In response to this issue, the Quad Cities engineering personnel conducted an additional review and determined that a spurious open circuit on the relaying and metering transformers for the unit auxiliary transformers or the reserve auxiliary transformers could have caused the neutral overcurrent relay to trip and prevent the operation of circuit breakers used to supply power to 4160 Volt electrical distribution Buses 13, 14, 23, and 24 (non-dash buses). This would have resulted in a loss of power to the residual heat removal service water system.

The licensee conducted a root cause analysis and found that Quad Cities Station was designed prior to the issuance of Institute of Electronics and Electrical Engineers Standard 279-1968, "Criteria for Protection Systems for Nuclear Power Generating Stations." This standard introduced the concept of single failure criterion. However, Quad Cities was licensed to General Electric NEDO Document 10139 which utilized single failure criteria consistent with Institute of Electronics and Electrical Engineers 279. The criteria in the NEDO document were applied to the reactor protection, containment isolation, core spray, low pressure coolant injection (LPCI), automatic depressurization, and high pressure coolant injection systems. However, it was not applied to the other residual heat removal system operating modes or to the residual heat removal service water system.

In 1985 Quad Cities personnel performed a re-classification effort in which specific loads and buses were upgraded to safety-related. As a result of this effort, the non-dash buses and the residual heat removal service water system were re-categorized as safety-related. The licensee believed that the re-classified buses and equipment were single failure proof since they were unaware of the vulnerability in the electrical distribution system. Although several single failure vulnerability reviews have been conducted since 1985, the licensee did not believe that these reviews would have identified the specific vulnerability identified at Crystal River or LaSalle.

Analysis: The inspectors determined that the presence of a single point vulnerability on the relaying and metering circuitry of the unit auxiliary transformers and the reserve auxiliary transformers was more than minor because if left uncorrected the vulnerability could lead to a condition where power to the residual heat removal service water pumps would not be available following a loss of offsite power event. The inspectors also determined that this finding should be evaluated using the Significance Determination Process because the finding was associated with the operability, availability and functionality of a mitigating system. The inspectors conducted a Phase 1 screening and determined that a Phase 2 screening was required since this issue impacted both the initiating events and mitigating systems cornerstones.

As part of the Phase 2 evaluation, the inspectors assumed an exposure time of greater than 30 days since the single point vulnerability had existed since the early 1970's. In addition, the inspectors determined that the loss of offsite power worksheet was the only worksheet that needed to be solved since a spurious open circuit was the only condition which contributed to the potential loss of power to the residual heat removal service water pumps. The inspectors reviewed the guidance provided in Inspection Manual Chapter 0609, Appendix A, Attachment 2, "Site Specific Risk-Informed Inspection Notebook Usage Rules," and determined that the loss of offsite power initiating event

likelihood should be increased from a 1 to a 2 since the spurious open circuit increased the likelihood of a loss of residual heat removal service water event. Recovery credit was also allowed due to the ability to cross tie residual heat removal service water from the alternate unit. Solving worksheet sequences 5 and 6 resulted in a value of 4 (potentially red). As a result, the inspectors requested that a Phase 3 analysis be completed.

The Region III senior reactor analyst performed a Phase 3 analysis of this finding and determined that it was of very low safety significance (Green). The frequency of the postulated circuit failure would be the initiating event frequency which was determined to be 1.0E-4/yr based on the licensee's analysis of operating experience of metering equipment failures. The NRC's standardized plant analysis risk model was used to estimate the change in core damage frequency given that the single failure would result in a transient resembling a loss of offsite power event with all residual heat removal service water pumps unavailable. The result was a change in core damage frequency less than 1.0E-6. The dominant accident sequence was a loss of offsite power with the eventual loss of all containment heat removal if the single failure was not recovered and power restored to the residual heat removal service water pumps. The licensee performed an analysis of the finding which explicitly considered the use of the opposite unit's residual heat removal service water system and recovery of initiating event. The results of the licensee's analysis was a change in core damage frequency much less than 1.0E-6.

The core damage frequency contribution from external events was reviewed using information provided in the licensee's Individual Plant Examination for External Events submittal. These circuits are located in control room cabinets. The fire frequency for a control room cabinet was approximately 3.0E-4/yr. Since the control room is continuously manned, any fire that occurred would have a high likelihood of being detected and suppressed before becoming severe enough to damage plant equipment. After considering the low probability of non-suppression of the fire, the frequency of a fire severe enough to result in the circuit failure was estimated to be less than the frequency of the circuit failure due to random failure. Therefore, the contribution to the change in core damage frequency from fire was estimated to be at least an order of magnitude lower than the delta core damage frequency from random failures and internal events. Additionally, the increase in core damage frequency due to seismic, tornado, and other postulated external events was determined to be negligible. Since the dominant sequence in the analysis was a long term core damage scenario, no change in large early release frequency was considered to contribute to the risk significance of the finding.

Enforcement: Title10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to assure that applicable regulatory requirements are correctly translated into specifications, drawings, procedures, and instructions. Measures shall also be established for the identification and control of design interfaces. Contrary to the above, measures were not appropriately established to ensure that the interfaces between the relaying and metering circuitry, the reserve auxiliary and unit auxiliary transformers, and the electrical buses which supply power to the residual heat removal service water system were appropriately controlled since the 1985 re-classification of residual heat removal service water as safety-related. Because this

violation was of very low safety significance, and because the issue was entered into the licensee's corrective action program as Issue Report 297548, the issue is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000254/2005005-04; 05000265/2005005-04)**. The inspectors determined that this issue constituted an old design issue per the guidance contained in NRC Inspection Manual Chapter 0305 because the issue was licensee identified and was not expected to have been identified by any previously completed licensee review efforts. Corrective actions for this issue included the design and installation of a temporary modification to eliminate the single failure vulnerability. The licensee planned to review the alternating current, direct current, and emergency diesel generator systems in an effort to identify other vulnerabilities and to design and install a permanent modification to fully resolve this issue.

4OA4 Cross-Cutting Aspects of Findings

.1 A finding described in Section 1R15 of this report had, as its primary cause, a human performance deficiency, in that, engineering personnel failed to fully implement a procedure to determine the continued operability and extent of condition for the safety-related piping after a flaw was revealed in the residual heat removal system. However, after the procedure was properly implemented the subsequent information did not affect the operability determination of the residual heat removal service water system.

.2 A finding described in Section 1R22 of this report had, as its primary cause, a human performance deficiency, in that, maintenance personnel failed to follow a procedure when lubricating an auxiliary contact that resulted in the eventual inoperability of the residual heat removal system loop drywell spray inboard isolation valve 2-1001-26B.

4OA5 Other Activities

Cornerstones: Initiating Events and Mitigating Systems

.1 Operational Readiness of Offsite Power (Temporary Instruction 2515/163)

The objective of Temporary Instruction 2515/163, "Operational Readiness of Offsite Power," was to confirm, through inspections and interviews, the operational readiness of offsite power systems in accordance with NRC requirements. The inspectors reviewed licensee procedures and discussed the attributes identified in Temporary Instruction 2515/163 with licensee personnel during the 2nd Quarter of 2005. The results of the inspectors' review were forwarded to Office of Nuclear Reactor Regulation (NRR) for additional review and evaluation.

Following review and evaluation by the NRR staff, several follow-up questions were sent back to the inspectors for discussion with licensee personnel. The results of the inspectors' review and discussion of the follow-up questions, performed during the 3rd Quarter of 2005, were again forwarded to NRR for evaluation.

The completion of this temporary instruction was documented in NRC Inspection Report 05000254/2005005; 05000265/2005005, and represented one inspection sample. The follow-up questions the inspectors discussed with licensee personnel during this

inspection period were considered a part of the original inspection sample, and did not constitute an additional inspection sample for this temporary instruction.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. R. Gideon and other members of licensee management at the conclusion of the inspection on October 4, 2005. 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:

- The radiation monitoring instrumentation and protective equipment program with Mr. T. Tulon on June 30, 2005.

4OA7 Licensee-Identified Violations

No findings of significance were identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
T. Tulon, Site Vice President
R. Gideon, Plant Manager
R. Armitage, Training Manager
D. Barker, Work Control Manager
W. Beck, Regulatory Assurance Manager
T. Hanley, Maintenance Manager
K. Moser, Engineering Manager
V. Neels, Chemistry/Environ/Radwaste Manager
K. Ohr, Radiation Protection Manager
M. Perito, Operations Manager
G. Rankin, Radiation Protection Supervisor

Nuclear Regulatory Commission
G. Dick, NRR Project Manager
M. Ring, Chief, Reactor Projects Branch 1

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000254/2005005-01; 05000265/2005005-01	NCV	Failure to Follow the Code Case N–513 Control Measures for Inspections and Tests
05000254/2005005-02; 05000265/2005005-02	NCV	Lack of Procedure Instruction in Procedure QCEMS 0250-11 to Evaluate Aero Shell 7 Grease for Lubricant and Thickener Separation
05000254/2005005-03; 05000265/2005005-03	NCV	Misapplication of Aero Shell 7 Grease
05000254/2005005-04; 05000265/2005005-04	NCV	4160 Volt Relaying and Metering Single Failure Vulnerability

Closed

05000254/2005005-01; 05000265/2005005-01	NCV	Failure to Follow the Code Case N–513 Control Measures for Inspections and Tests

05000254/2005005-02; 05000265/2005005-02	NCV	Lack of Procedure Instruction in Procedure QCEMS 0250-11 to Evaluate Aero Shell 7 Grease for Lubricant and Thickener Separation
05000254/2005005-03; 05000265/2005005-03	NCV	Misapplication of Aero Shell 7 Grease
05000254/2005005-04; 05000265/2005005-04	NCV	4160 Volt Relaying and Metering Single Failure Vulnerability
05000254/2005001-00; 05000265/2005001-00	LER	4160 Volt Relaying and Metering Single Failure Vulnerability

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 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.

1R04 Equipment Alignment

QCOP 2300-01; HPCI Preparation for Standby Operation; Revision 42
QCOP 2300-08; HPCI Local Manual Operation; Revision 20
QOM 1-2300-01; U1 HPCI Valve Checklist; Revision 9
QCOP 1000-02; RHR System Preparation for Standby Operation; Revision 22
QCOP 1000-04; RHR Service Water System Operation; Revision 18
QOM 2-1000-04; U2 RHR Valve Checklist; Revision 10
QOM 2-1000-09; U2 RHR Valve Checklist; Revision 3
QOM 2-1000-05; U2 RHR Service Water Valve Checklist; Revision 15
QCOP 3700-02; RBCCW System Start-up and Operation; Revision 19
QOM 2-3700-01; U2 RBCCW Valve Checklist; Revision 6
QCOS 2300-10; HPCI Monthly Valve Position Verification; Revision 7
QOM 2-2300-01; U2 HPCI Valve Checklist; Revision 14

1R05 Fire Protection

Issue Report 346431; Fire Protection Surveillance Not Implemented; dated June 22, 2005
Fire Hazards Analysis for Quad Cities Unit 1 and 2
Pre-Fire Plans

1R11 Licensed Operator Requalification

Licensed Operator Requalification Training LORT-1041-ECORE; Loss of RPS Bus/Mispositioned Control Rod/Loss of Vacuum/ATWS; Revision 3
QGA 100; RPV Control; Revision 7
QGA 200; Primary Containment Control; Revision 8
QGA 300; Secondary Containment Control; Revision 11
QGA 400; Radioactivity Release Control; Revision 5
QGA 500-1; RPV Blowdown; Revision 11
QGA 500-2; Steam Cooling; Revision 9
QGA 500-4; RPV Flooding; Revision 12

1R12 Maintenance Effectiveness

Functional Failure Cause Determination 330760-02; dated June 8, 2005
Maintenance Rule Evaluation History for Maintenance Rule System Z5707 from January 2005 through July 2005; dated July 12, 2005

Maintenance Rule Performance Criteria for System Z5707, Function 01; dated July 12, 2005
Functional Failure Cause Determination for Issue Reports 328781 and 325710; dated May 12, 2005
Issue Report 339857; Unit 1 Reactor Feed Pump Ventilation System Maintenance Rule Function Z5707-01 Declared (A)(1); dated May 31, 2005
Unit 1 Reactor Feed Pump Ventilation System Health Report; dated June 20, 2005
Maintenance Rule Evaluation History for Maintenance Rule System Z4700 from January 2004 through August 2005
Issue Report 285799; 1A Instrument Air Compressor Tripped on Low Oil Pressure; dated December 27, 2004
Issue Report 318618; Unit 2 Instrument Air Low Pressure, Unexpected Alarm; dated March 29, 2005
Issue Report 353299; ½ Instrument Air Compressor Tripped; dated July 15, 2005
Issue Report 353302; Unit 2 Instrument Air Compressor Tripped After Started for Instrument Air Transient; dated July 15, 2005
Issue Report 363757; Unit 2 Instrument Air Compressor Tripped on Low Oil Pressure; dated August 17, 2005
Issue Report 231909; Unit 2 Instrument Air Compressor Air dryer Failed to Swap and Bypass Auto Opened; dated June 27, 2004
Issue Report 225058; Maintenance Rule Functional Failure for Z4700-01; dated June 1, 2004
Issue Report 285807; 1A Instrument Air Compressor Would Not Stay Running; dated December 27, 2004

1R13 Maintenance Risk Assessment and Emergent Work

Work Week Safety Profiles for the Weeks of July 18 - 24, August 8 - 14, August 15 - 21, September 11 - 17, and September 18 - 24, 2005
Daily Production Schedules; dated July 18 - 24, August 8 - 14, August 15 - 21, September 11 - 17, and September 18 - 24, 2005
Issue Report 356206; Received Unit 1 Main Generator Overexcitation Alarm; dated July 24, 2005

1R14 Personnel Performance During Non-Routine Evolutions

QCGP 3-1; Reactor Power Operations; Revision 46
QCGP 4-1; Control Rod Movements and Control Rod Sequence; Revision 28
TIC 1274; Temporary Procedure to Determine Maximum Power Level for Unit 1 with Two Reactor Feed Pumps and Three Condensate Pump Operation; dated July 25, 2005

1R15 Operability Evaluations

Troubleshooting Log for Work Order 811480-01; Troubleshoot Indicating Trip Unit 2-1705-16A and Associated Equipment; dated May 13, 2005
Issue Report 350470; 2A Fuel Pool Rad Monitor Operability Determination; dated July 5, 2005

Issue Report 334872; 2A Fuel Pool Rad Monitor Spurious Trip; dated May 13, 2005
Prompt Investigation Report for Issue Report 334872; 2A Fuel Pool Rad Monitor Spurious Trip; dated May 16, 2005
Issue Report 349158; 2A Fuel Pool Rad Monitor Inadvertent High Alarm; dated June 30, 2005
Prompt Investigation Report for Issue Report 349158; 2A Fuel Pool Rad Monitor Inadvertent High Alarm; dated July 5, 2005
Issue Report 350322; 2A Refuel Rad Monitor Upscale Alarm; dated July 5, 2005
Prompt Investigation Report for Issue Report 350322; 2A Refuel Rad Monitor Upscale Alarm; dated July 11, 2005
Issue Report 360535; CRD H8 High Temperature; dated August 5, 2005
QCOS 0300-12; CRD Temperature Surveillance; Revision 2
Issue Report 358549; 1B Core Spray Room Cooler Low Flow; dated August 1, 2005
Issue Report 143666; White Residue Found at 480 Volt MCC Auxiliary Contacts; dated February 5, 2003

1R19 Post Maintenance Testing

Work Order 653413; ANI Inspection of 2A RBCCW Heat Exchanger; dated August 18, 2005
ER-AA-340-2000; Balance-of-Plant Heat Exchanger Inspection, Testing, and Maintenance Guide; Revision 1
Work Order 631172; Replacement of Unit 1 Diesel Generator Cooling Water Pump; dated September 22, 2005
QCOS 6600-06; DGCW Pump Flow Rate Test; Revision 27

1R22 Surveillance Testing

QCIS 0010-01; Strong Motion Accelerometer Recorder Operability Test; Revision 3
Issue Report 347036; Clarification Regarding Seismograph Issues; dated June 23, 2005
Issue Report 346171; Seismograph Event Recorded; Operator Rounds Were Inadequate; dated June 21, 2005
Issue Report 346546; Seismograph Data Does Not Make Sense; dated June 21, 2005
QCOP 0010-07; Seismograph Event Retrieval; Revision 3
Exelon Power Labs Report QDC-50271; Failure Analysis for General Electric CR105X Auxiliary Contact Removed from 480 Volt MCC 29-4 Cubicle D3; dated April 18, 2005
EPRI NP-6408; Guidelines for Establishing, Maintaining, and Extending the Shelf Life Capability of Limited Life Items (NCIG-13), dated May 1992
EPRI NP-4916-R3; Lubrication Guide; dated October 2001
Work Order 702534; RHR System Valve Timing Test; dated August 25, 2004
QCOS 1000-09; RHR Power Operated Valve Test; Revision 17
Issue Report 305516; Corporate PE to Review Shelf Life for Grease Lubricants; dated February 25, 2004
Issue Report 275607; MO-1-1001-26A Would Not Open During QCOS 1000-09; dated February 22, 2004
QCEMP 0700-06; Unit 1(2) Scram Contactors Maintenance Channel A and Channel B; Revision 17
MA-AA-716-006; Control of Lubricants Program; Revision 3

Work Order 730700; RHR System Valve Timing Test; dated November 21, 2004
QCEMS 0250-11; 480/208 VAC Motor Control Center Maintenance and Surveillance; Revision 42

2OS3 Radiation Monitoring Instrumentation and Protective Equipment Program

Whole Body Counter Calibration; dated September 1, 2004
10 CFR Part 61 Analysis Data; dated March - April 2004
Monthly Surveillance Records For SCBAs in Use; January Through June, 2005
Fire Drill SCB as Post Use/Post Maintenance for 2005
Updated Final Safety Analysis Report
CY-QC-130-407; CAM Source Calibration Record; dated July 26, 2004
QIP-1800-01-S01; Refuel Floor High Range ARM #2 Calibration; dated July 22, 2004
QCIS-2400-01; Division 1 Drywell Rad Monitor Calibration and Function Test; dated March 8, 2005
QCIPM-1800-04; Area Rad Monitor Calibration Data; dated November 4, 2004
Calibration Certificate; AMP 200 Radiation Detector 7704-031; dated February 10, 2005
Calibration Certificate; AMP 100 Radiation Detector 5004-103; dated February 10, 2005
Calibration Certificate; ASP2E Radiation Detector 0295; dated April 25, 2005
Calibration Certificate; RO-20 Radiation Detector 005210; dated February 10, 2005
Calibration Certificate; RSO 50E Radiation Detector B992M; dated February 4, 2005
Calibration Certificate; AMS-4 Radiation Detector 107; dated May 4, 2005
Calibration Certificate; FH40G-L Radiation Detector 015498; dated January 28, 2005
Calibration Certificate; RM-25 Radiation Detector 395; dated January 14, 2005
Calibration Certificate; ASP1/NRD Radiation Detector 3474; dated February 17, 2005
NOSPA-QC-05-1Q; NOS Objective Evidence Report; dated March 4 and 31, 2005
NOSPA-QC-04-4Q; NOS Objective Evidence Report; dated November 30 and December 22, 2004
NOSPA-QC-04-2Q; NOS Objective Evidence Report; dated June 18, 2004
AR337011; Apparent Cause Evaluation: Individual Provided Inaccurate Information On NRC Form 4; dated May 19, 2005
AR346044; SCBA Trouble, Regulator or Mask Valve; dated June 21, 2005
AR197967; NOS ID'd PQD Discrepancies For Operator Quals; dated January 28, 2004
AR198002; SCBA Respirator Failed During Fire Drill; dated January 28, 2004
AR203404; Control Room Breathing Air Questions; dated February 23, 2004
AR208955; NOS ID'd Hands On Training Needed For Breathing Air Hookup; dated March 17, 2004
AR216071; SCBA Issues; dated April 19, 2004
AR249373; Unqualified Individual Given Mask Fit and Respiratory Level 1 Qual; dated August 30, 2004
Personnel Training Data For SCBA Use
MSA Technicians Certification: Registration No. W-1035
SCBA maintenance Log Data
Tri-State Fire Control Test Log For Air Cylinders; dated June 16, 2004
RP-AA-221; Whole Body Counter Data Review; Revision 1
RP-AA-300-1002; Electron Capture Isotope Control; Revision 0
RP-QC-828; Maintenance And Inspection Of The MSA SCBA; Revision 2
RP-QC-829; Operation and Use Of The MSA SCBA; Revision 0

2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Program

Quad Cities Nuclear Power Station, Units 1 and 2 Renewed Facility Operating License Numbers DPR-29 and DPR-30 Letter; Quad Cities Nuclear Power Station Annual Radiological Environmental Operating Report; dated May 13, 2005
CY-QC-120-737; Radioactive Liquid Discharge Batch Analysis; Revision 5
EP-AA-112-500-F-05; Midwest Environmental Sample Collection Guidelines; Revision A
CY-AA-170-1000; Radiological Environmental Monitoring Program and Meteorological Program Implementation; Revision 0
CY-AA-170-100; Radiological Environmental Monitoring Program; Revision 1
Quad Cities Nuclear Power Station, Units 1 and 2 Renewed Facility Operating License Numbers DPR-29 and DPR-30 Letter; Quad Cities Nuclear Power Station Radioactive Effluent Report for January through December 2004; dated April 29, 2005
Issue Report 342606; LLD Value Error in Annual REMP Report; dated June 9, 2005
Issue Report 184733; Milk Animals Not Properly Accounted for on Land Use Census; dated November 4, 2003
Issue Report 189306; REMP Sample Station Q-3 Has Several Inches of Water in Building; dated December 5, 2003
Issue Report 238197; REMP Contractor Sample Manual Needs Revision; dated July 21, 2004
Issue Report 238494; Vegetation Around REMP Sample Station Too High; dated July 3, 2004
Issue Report 256525; Evaluation of Quad Cities Ground Water Tritium Concentration; dated September 24, 2004
Issue Report 263046; Original REMP Records Not Being Submitted to Exelon; dated October 13, 2004
Issue Report 287589; REMP Sample Not Collected per ODCM; dated December 24, 2004
Issue Report 287603; REMP Air Sampler had Unexpected Low Collection Time; dated December 17, 2004
Issue Report 293145; REMP Sample Not Collected Per ODCM; dated December 7, 2004
Issue Report 301550; REMP Sample Not Collected per ODCM; dated January 7, 2005
Issue Report 301551; REMP Sample Not Collected per the ODCM; dated January 14, 2005
Issue Report 301552; REMP Sample Not Collected per ODCM; dated January 21, 2005
Issue Report 306522; REMP Check-in Assessment Results; dated February 28, 2005
Issue Report 317792; Environmental Monitoring TLD's Discovered Missing; February 26, 2005

4OA2 Identification and Resolution of Problems

Issue Report 143666; White Residue Found at 480 Volt MCC Auxiliary Contacts; dated February 5, 2003
Exelon Power Labs Report QDC-50271; Failure Analysis for General Electric CR105X Auxiliary Contact Removed from 480 Volt MCC 29-4 Cubicle D3; dated April 18, 2005

EPRI NP-6408; Guidelines for Establishing, Maintaining, and Extending the Shelf Life Capability of Limited Life Items (NCIG-13), dated May 1992
EPRI NP-4916-R3; Lubrication Guide; dated October 2001
Work Order 702534; RHR System Valve Timing Test; dated August 25, 2004
QCOS 1000-09; RHR Power Operated Valve Test; Revision 17
Issue Report 305516; Corporate PE to Review Shelf Life for Grease Lubricants; dated February 25, 2004
Issue Report 275607; MO-1-1001-26A Would Not Open During QCOS 1000-09; dated February 22, 2004
QCEMP 0700-06; Unit 1(2) Scram Contactors Maintenance Channel A and Channel B; Revision 17
MA-AA-716-006; Control of Lubricants Program; Revision 3
Work Order 730700; RHR System Valve Timing Test; dated November 21, 2004

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
HPCI	High Pressure Coolant Injection System
IMC	Inspection Manual Chapter
LER	Licensee Event Report
LPCI	Low Pressure Coolant Injection System
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records
RCIC	Reactor Core Isolation Cooling System
RHRSW	Residual Heat Removal Service Water System
SDP	Significance Determination Process